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# Three essays on corporate social responsibility, business politicians and corruption

Dina Mohamed Kamal Kassab

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Dina Mohamed Kamal Kassab. Three essays on corporate social responsibility, business politicians and corruption. Economics and Finance. Université Panthéon-Sorbonne - Paris I, 2015. English. NNT : 2015PA010021 . tel-01663097

**HAL Id: tel-01663097**

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**THESE**

Pour l'obtention du grade de Docteur de l'Université Paris 1, Panthéon-Sorbonne  
Spécialité : Economie (UFR 02)

Présentée par

**Dina KASSAB**

**THREE ESSAYS ON CORPORATE SOCIAL  
RESPONSIBILITY, BUSINESS POLITICIANS AND  
CORRUPTION**

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**TROIS ESSAIS SUR LA RESPONSABILITE SOCIALE  
DES ENTREPRISES, LES HOMMES  
D’AFFAIRES-POLITICIENS ET LA CORRUPTION**

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# Acknowledgments

This thesis would have been impossible without the support and mentoring of my advisors Mireille CHIROLEU-ASSOULINE and Pierre FLECKINGER. I would like to thank them for their academic guidance, feedback and inspiring discussions of ideas underlying this work. But most importantly, I would like to thank them for their continuous support in the roughest of times, personal openness and friendship.

I would like to express my special appreciation and thanks to Professor Stefan AMBEC, Professor Vianney DEQUIEDT, Professor Ariane LAMBERT-MOGILIANSKY and Professor Jean-Philippe TROPEANO, for granting me the honor of being members of the Jury.

This work benefitted from valuable comments and suggestions by (non-exhaustively) Stefan AMBEC, Vianney DEQUIEDT and Thomas LYON as well as Nicolas JACQUEMET and Stéphane GAUTHIER.

Words cannot express how immensely grateful and indebted I am to my husband who gave me his full and unconditional support and love, and to my son who taught me to be curious about everything I see and question *everything* I know, literally. Thank you both for bringing joy and serenity into my life.

Last but not least, a special thanks to my mother and mother-in-law for all the sacrifices they have made on my behalf.



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## Note de Présentation Synthétique en Français

Le 11 Janvier 2015, des milliers d'Égyptiens ont envahi la place Tahrir, le cœur symbolique de l'Égypte. Cette révolution était le résultat naturel de la rage contre le règne de l'ancien président Moubarak qui s'est développée durant la dernière décennie. Les manifestations ont abouti à l'arrestation des anciens fonctionnaires d'Etat et politiciens, et une série d'arrestations et d'interdictions de voyager pour les autorités de haut niveau a suivi l'éviction du régime de l'ancien président. Celle-ci reposait sur plusieurs accusations dont le détournement de fonds, les bénéfices excessifs, la prise de pot-de-vin, l'appropriation illicite et le blanchiment de fonds. Les Égyptiens avaient du mal à croire ce qui se passait : pour la première fois depuis trente ans, le public commence à croire que la loi est appliquée à tous et que personne n'en est à l'abri. Les opinions à propos des procès étaient divergentes. Certains célébraient le règne de la loi et le fait que les revendications principales de la révolution "Pain, Liberté, Justice Sociale et Dignité" chantées à chaque manifestation étaient enfin satisfaites. D'autres, surtout dans les zones rurales, trouvaient les procès injustifiés ; ils sympathisaient avec les politiciens arrêtés qui étaient en même temps les hommes d'affaires les plus influents dans l'économie.

Ce mélange des genres – ce qu'on appelle le phénomène des *Hommes d'affaires-Politiciens* – était un trait dominant de l'économie égyptienne avant la révolution de 2011. Le pouvoir des hommes d'affaires s'était considérablement accru dans le Parti National Démocratique (PND)<sup>1</sup>, le gouvernement, l'Assemblée du Peuple (le Parlement égyptien) pendant le mandat du premier ministre Ahmed Nazif, depuis 2004 jusqu'à 2011. Pour le profane, la liste des membres du Parlement égyptien pourrait être facilement prise pour celle des hommes d'affaires les plus éminents. Le lien fort entre l'argent et le politique en Egypte était évident. Pour demeurer membre de l'un des deux clubs, il fallait être membre de l'autre.

Selon les estimations, environ un cinquième de l'Assemblée du Peuple était composé d'hommes d'affaires fortunés et l'opposition était impuissante devant cette oligarchie. Dans les élections de 2010, les magnats de l'industrie, membres du Parti National Démocratique, se sont taillé la part du lion en tant que présidents des 19 commissions du Parlement. Par exemple, Ahmed Ezz, Secrétaire du parti pour les

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<sup>1</sup>qui était le parti au pouvoir à l'époque.

affaires organisationnelles et magnat important de l'acier, a été élu président de la commission du budget trois fois entre 2000 et 2011. Mohamed Aboul-Enein, industriel bien connu et également membre du PND, a conservé en 2010 sa position de président de la commission de l'industrie et de l'énergie pour la seconde fois depuis 2005.

L'aspect le plus intéressant du comportement des Hommes d'affaires-Politiciens en Egypte est qu'ils investissent des montants importants, à travers leurs activités de Responsabilité Sociale des Entreprises (RSE)<sup>2</sup>, dans la provision de biens publics<sup>3</sup> que le gouvernement, dont ils font partie, tend à fournir en quantité insuffisante. Le président du Groupe Mansour, l'un des principaux conglomérats du secteur privé en Egypte (présent dans plusieurs secteurs industriels en six grands domaines d'activité, dont l'automobile, les marchés de capitaux, la grande consommation, les équipements industriels, la logistique et les services ; il est également le distributeur exclusif de marques internationales comme General Motors, Caterpillar, Crédit Agricole Bank, Phillip Morris, UPS, Michelin, Samsung) était ministre du transport sous le régime de Moubarak. La "Fondation Mansour pour le Développement" entreprend des projets de RSE visant à éradiquer l'analphabétisme, financer des orphelinats... etc.

L'entreprise d'eau potable, Hayat, qui fait partie du Groupe Mansour, fait un don de 8,000 m<sup>3</sup> d'eau par jour aux habitants du village de "Siwa" pour l'usage agricole. La compagnie contribue également au quotidien 100 kw/hr d'électricité qu'elle produit localement et qui est utilisée pour alimenter l'école du village, son principal cabinet médical, les bâtiments des services sociaux et la Mosquée, gratuitement. Suivant la même tendance, Abou El Enein, politicien bien connu et président du groupe industriel Ceramica, un autre des conglomérats les plus importants en Egypte, a fondé en 2001 "L'Organisation Abou El Enein pour les Activités Sociales et Caritatives" qui entreprend des activités d'alphabétisation, d'amélioration de services sanitaires, de soutien aux petites et moyennes entreprises et aux ménages dirigés par les femmes.

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<sup>2</sup>La RSE est définie comme étant des activités à travers lesquelles les firmes contribuent au développement durable et prennent la responsabilité de leur impact sur la société.

<sup>3</sup>allant de l'éducation, la santé, l'accès à l'eau et l'électricité – ce que l'on appelle infrastructure économique – au respect des droits de l'homme, l'émancipation des femmes – ou infrastructure sociale .

L'élite au pouvoir est-elle constituée d'hommes d'affaires bienveillants qui interviennent là où le gouvernement est le moins performant ? Ou la performance du gouvernement est-elle affectée par le fait qu'un bien public fourni en quantité insuffisante augmente la profitabilité ou améliore la réputation des Hommes d'affaires-Politiciens ? Un bon exemple est celui de Ahmed Ezz, l'ancien secrétaire général du PND. Dans le cadre des activités de RSE de son entreprise sidérurgique, il offrait une tonne d'acier à chacun des 30,000 bénéficiaires du projet "Construis ta propre maison", qui étaient majoritairement des jeunes à faible revenu. Pourtant, en tant que politicien, il n'a pas accordé d'intérêt particulier au problème de logement.

A priori, on s'attendrait à ce qu'un niveau insuffisant de bien public fourni par l'Etat et des faveurs accrues accordées aux hommes d'affaires aient, au moins, un impact sur leur *réputation*. Curieusement, ce ne fut pas le cas. Pour un grand secteur de la population, ces Hommes d'affaires-Politiciens étaient les sauveurs de l'économie. Ces derniers étaient plus efficaces quand il s'agissait de satisfaire les besoins de la population.

Un exemple assez parlant est fourni par le fait que, dans les zones rurales où le manque de biens publics est le plus frappant, les campagnes électorales sont axées sur le nombre de routes, écoles et hôpitaux que chacun des hommes d'affaires a financés à travers son entreprise privée. Ces pratiques ont persisté même après la révolution. Durant le mandat de l'ancien président Mohamed Morsi (juin 2012- juillet 2013), les principaux hommes d'affaires, membres du parti des Frères Musulmans nommé "Parti de la Liberté et de la Justice" (PLJ), et qui possèdent de grandes chaînes de supermarché, ont distribué des produits alimentaires dans les quartiers pauvres, dans le cadre des activités philanthropiques de leurs entreprises, à un moment où l'inflation s'était aggravée. Ces activités visaient à promouvoir les candidats du parti aux élections pour le Parlement. La chaîne de supermarché Khair Zaman - détenue par Khairat Al-Chater, numéro deux et trésorier des Frères Musulmans<sup>4</sup> - a donné des sacs de sucre, d'huile, de farine et de riz aux citoyens, surtout dans les régions les plus défavorisées. La principale préoccupation des électeurs n'était pas de savoir qui était responsable de l'augmentation des prix, mais plutôt qui est venu à leur aide

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<sup>4</sup>Premier adjoint du guide suprême des Frères musulmans, il était le candidat initial du PLJ aux élections présidentielles de 2012 avant que sa candidature ne fut invalidée par le Conseil suprême des forces armées.

durant cette forte inflation. Peu nombreuses sont les analyses du fonctionnement de cet Etat où l'argent confère plus de pouvoir politique et le pouvoir politique augmente la richesse de telle façon que les hommes d'affaires influents bénéficient de leur statut en tant que membres du gouvernement.

Outre le phénomène des *Hommes d'affaires-Politiciens*, les politiciens qui ne possédaient pas leur propre entreprise étaient influencés par les hommes d'affaires à travers *les pots-de-vin*. Ce phénomène était, et reste toujours, répandu dans l'économie égyptienne. De nombreux ministres nommés vers la moitié des années 2000 ont pratiqué la corruption à une échelle jusqu'alors inconnue. Ils ont vendu des parts du secteur public au profit de quelques hommes d'affaires et ont réduit l'investissement public dans l'agriculture, la bonification des terres, le logement, l'éducation et la santé. En revanche, ils ont promu l'investissement privé dans la construction de communautés fermées pour les élites et l'établissement d'hôpitaux et d'universités à but lucratif. Le gouvernement était incapable de fournir un niveau décent de biens publics étant donné que d'énormes sommes de fonds publics étaient détournées et que la prise de pot-de-vin était une maladie assez commune des organismes de l'Etat.

## Questions de Recherche

Cette thèse de doctorat est motivée par ces trois aspects particuliers de l'économie égyptienne qui ont mené à la révolution : la relation entre les investissements en RSE et la fourniture de biens publics par le gouvernement, la concentration de pouvoirs entre les mains de l'élite et la propagation de la corruption entre les différents organismes du gouvernement. A quel point l'approvisionnement des biens publics par les entreprises est-il en mesure de compléter ou remplacer la fourniture de ces biens par l'Etat ? Ces pratiques devraient-elles alors être récompensées par des exonérations fiscales ou plutôt taxées pour promouvoir la provision par l'Etat ? Quand le canal de la réputation est-il suffisant pour empêcher les Hommes d'affaires-Politiciens d'abuser de leur statut politique et quand devrait-il y avoir des règles économiques, politiques ou législatives pour empêcher ce conflit d'intérêts et limiter la corruption ? Comment la culture du pot-de-vin se propage-t-elle d'une organisation gouvernementale à une autre et quelles sont les mesures qui permettraient de

contrecarrer ce phénomène ?

Ces questions de recherche sont issues du terrain, durant l'année suivant la révolution<sup>5</sup> alors que l'Égypte élisait un nouveau président, rédigeait une nouvelle constitution et de réévaluait le Parlement<sup>6</sup>. Peu de recherche académique avait alors été conduite - ce qui est encore le cas actuellement - sur le potentiel d'investissement des entreprises dans les biens publics, surtout dans le contexte d'une économie où les groupes d'intérêt économiques ont une certaine influence sur la politique publique. C'est donc un travail exploratoire sur le champ nouveau des interactions entre RSE, influence politique et fourniture du bien public.

Chaque chapitre aborde ces questions sous un angle différent. Le premier chapitre explore la question de la RSE en tant que fourniture du bien public. Etant donné la nature de l'interdépendance entre la RSE et l'investissement du gouvernement dans le bien public, il met en évidence des cas où il est souhaitable que les activités de RSE soient subventionnées et d'autres où, au contraire, leur taxation permet d'engendrer des effets positifs en termes de redistribution. L'influence politique est au cœur du deuxième chapitre qui met l'accent sur le contenu du signal envoyé par les pratiques de RSE lorsque celles-ci procurent un avantage politique. Finalement, le Chapitre 3 prend un point de vue un peu différent et analyse une autre forme d'influence politique, celle de la corruption par des pots-de-vin, en analysant le mécanisme de transmission de la corruption passive d'un organisme gouvernemental à un autre.

## **La RSE en tant que Provision Privée d'un Bien Public**

Jusqu'à récemment, les marchés étaient perçus comme incapables d'assurer une tarification efficace pour les biens - ou nuisances - de nature non-marchande. Ainsi, le marché n'aurait pas tendance à répondre aux valeurs des individus ayant des préférences pour un environnement propre, une réduction du travail des enfants, des programmes de développement communautaire... Cette opinion fait écho à l'avis de Friedman (1970) qui soutient que les entreprises privées devraient poursuivre leur objectif de maximisation de profits tout en laissant aux gouvernements les questions

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<sup>5</sup>au moment où nous avons commencé à travailler sur cette thèse.

<sup>6</sup>Suite à la dissolution du Parlement élu en novembre 2010, un débat politique important était centré sur la question de *comment rendre le Parlement représentatif des intérêts de la population et non pas de ceux de l'Elite*.

relatives aux biens publics et aux externalités.

Au cours de la dernière décennie, cette dichotomie classique entre le rôle du gouvernement et celui des firmes a été dépassée. Les firmes investissent de plus en plus de ressources pour prendre en charge l'impact de leurs affaires sur la société, au-delà des obligations légales et de la réglementation. Des valeurs de nature sociale, environnementale, éthique ainsi que les droits de l'Homme et les préoccupations des consommateurs commencent à être intégrées aux processus fondamentaux de prise de décisions, de stratégie et de gestion des firmes. Ces pratiques sont connues sous le nom de Responsabilité Sociale des Entreprises.

L'analyse de la RSE relève deux difficultés conceptuelles. D'une part, la RSE se manifeste en un large éventail de pratiques diversifiées qui ne concernent pas nécessairement un *bien public pur*. A titre d'exemple, la Banque Mondiale définit la RSE comme étant "l'engagement du monde des affaires à contribuer au développement économique durable, en travaillant avec les employés, leurs familles, la communauté locale et la société au sens large pour améliorer la qualité de vie, de façon positive tant pour les affaires que pour le développement". Cette définition réunit un ensemble de pratiques assez hétérogènes. Certaines correspondent un *bien public mondial pur* telles la réduction des émissions de carbone et du travail des enfants. D'autres concernent un *bien public moins global* - dans le sens où seule la communauté où la firme opère en profite - comme les dons pour les causes sociales et le développement communautaire. Un autre ensemble d'activités peut être considéré comme un *bien semi-public*. Par exemple, l'amélioration des conditions de travail pour les employés est un bien non-rival pour les employés de la même entreprise mais exclusif dans le sens où seuls les employés de cette entreprise particulière en bénéficient. Finalement, certaines pratiques de RSE peuvent être qualifiées de *biens privés purs* telles que celles liées au bien-même que la firme produit et qui visent à améliorer les caractéristiques de celui-ci - comme par exemple les aliments et boissons sans pesticides et les appareils ménagers éco-énergétiques. Les bénéfices sont alors de nature rivale et exclusive puisque seuls les consommateurs du bien en jouissent.

D'autre part, de nombreuses motivations peuvent être à l'origine du choix de la firme d'entreprendre des activités de RSE. Même si l'existence de préférences

sociales est pré-requise pour que la firme s’engage en RSE<sup>7</sup>, il existe trois sources d’imperfection des marchés pouvant être qualifiées de moteurs de la RSE : les externalités et les biens publics, la concurrence imparfaite et les contrats incomplets<sup>8</sup>.

Les entreprises peuvent s’engager à la RSE à travers la fourniture de biens publics (ou la lutte contre les maux publics) soit pour répondre à la pression exercée par les ONGs et les activistes – ce que Baron (2001) désigne comme *private politics* – soit parce qu’elles anticipent une réglementation et que la RSE est alors un moyen de l’éviter ou au moins de réduire le coût de s’y conformer. La seconde source de défaillance des marchés est liée à la concurrence imparfaite. Les entreprises ont alors recours à la RSE comme moyen de différenciation de leur produit pour attirer les consommateurs socialement responsables, pour signaler la qualité du produit de confiance qu’elles offrent ou encore pour améliorer leur réputation. Enfin, les firmes peuvent avoir recours à la RSE pour surmonter les problèmes d’agence avec leurs parties prenantes. Dans ce sens, elle est conçue comme la responsabilité déléguée des actionnaires de l’entreprise, de ses dirigeants et de ses employés.

Au fil de cette dissertation, nous donnons de la cohérence à l’analyse en considérant les activités de RSE sous l’aspect de la fourniture d’un bien public ou semi-public. Par conséquent, la seule forme de pratiques exclue ici est celle où la RSE consiste à améliorer les caractéristiques du produit-même dont les seuls bénéficiaires sont ses consommateurs. Un ensemble de pratiques assez diversifiées étant étudié, le terme ”provision de biens publics par l’entreprise” devrait être plutôt pris au sens large. Nous utilisons le terme *RSE* de préférence à l’idée plus étroite de *firmes contribuant au bien public* qui suggèrerait une forme particulière de pratiques – telles que les dons à des causes sociales ou toute activité philanthropique. Les préférences sociales sont toujours considérées comme prérequis pour que les firmes entreprennent des activités de RSE, la concurrence imparfaite étant le moteur principal de celles-ci. Dans le Chapitre 1, la RSE est un moyen à travers lequel le producteur extrait le maximum de la propension à payer des consommateurs hétérogènes. Dans le Chapitre 2, la RSE est plutôt perçue comme un signal utilisé par les entreprises

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<sup>7</sup>de façon à ce que les activités de RSE de l’entreprise soient valorisées par au moins un type de parties prenantes – les consommateurs, les employés, les actionnaires, le régulateur, les dirigeants. . .

<sup>8</sup>Nous adoptons ici la classification des moteurs de la RSE présentée par Crifo et Forget (2015) par souci de simplicité. Une revue détaillée de la littérature sur la RSE sera présentée au fil des chapitres.

pour mettre leur réputation en valeur.

Les sections suivantes détaillent chaque chapitre et fournissent quelques éléments pour contextualiser les contributions qui sont apportées à la littérature de la RSE, des jeux de signaux et de la théorie des incitations.

## RSE et Régulation : Faudrait-il Taxer le Comportement Ethique ?

Comme point de départ, le Chapitre 1 présente un cadre théorique pour illustrer la façon dont nous appréhendons la RSE en tant qu'activités induites par la demande des consommateurs. Nous considérons un marché de monopole où le producteur offre, à côté du bien privé qu'il produit, une contribution à un bien public. Nous l'assimilerons dans la suite à un investissement en RSE qui peut être complémentaire ou substituable à l'investissement public de l'Etat. Les consommateurs sont supposés avoir des préférences homogènes vis-à-vis du bien privé mais hétérogènes à l'égard de l'aspect bien public, c'est-à-dire le contenu en RSE du bien offert sur le marché. Les consommateurs les plus socialement engagés - les plus *altruistes* - tirent plus d'utilité dite de *warm-glow*<sup>9</sup> de la RSE et ont donc une propension marginale à payer plus élevée. Le motif de *préoccupation d'image* selon lequel les consommateurs voudraient acheter le bien avec contenu RSE pour être perçus comme socialement responsables est également considéré. Moins nombreux sont les acheteurs du bien, plus celui-ci devient un produit de niche et donc plus l'utilité en termes de *prestige* qu'il confère à ses consommateurs est importante. Les consommateurs apprécient alors, à différents degrés, le produit de la firme entreprenant de la RSE. Elle est ainsi perçue comme une stratégie de maximisation de profit menée par la firme quand les consommateurs sont prêts à sacrifier de l'argent pour concourir à la réalisation d'objectifs sociaux.

Sous ces hypothèses, nous construisons le modèle de base qui nous permet d'établir notre scénario de la *non-régulation*. L'économie est composée d'un monopole et d'une masse unitaire de consommateurs qui interagissent sur le marché, sans aucune intervention publique. La stratégie de tarification des biens avec contenu RSE ainsi que les conditions sous lesquelles ces activités augmentent le bien-être social - par rapport à un scénario sans RSE - sont identifiées. Ensuite, nous introduisons dans le modèle un régulateur, ou un planificateur social, qui définit une certaine taxe à la consommation, étant donné que le rendement de la taxe sera recyclé sous forme d'investissement dans le bien public par l'Etat. Un point essentiel de l'analyse

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<sup>9</sup>définie dans la littérature de la provision privée de biens publics comme le "goût de donner" ou l'utilité que reçoit l'individu en contribuant au bien public.

est la prise en compte de la nature d'interdépendance entre investissements public et privé, à savoir leur substituabilité ou leur complémentarité. Le niveau de la taxe optimale est calculé dans chaque cas et les résultats sont contrastés. Finalement, nous comparons le niveau de la taxe choisie pour différents objectifs du régulateur.

Le modèle de base permet d'illustrer la stratégie de tarification du bien avec RSE. Dans un marché de monopole, chaque dollar dépensé pour contribuer au bien public à travers l'achat du produit avec contenu RSE coûte au consommateur davantage qu'un dollar. Ceci est dû au fait que le producteur facture ces activités et en tire un profit. Augmenter le contenu du produit en RSE mène à une augmentation de son prix et donc la niche des consommateurs achetant le bien devient de plus en plus étroite. En raison de cet effet d'exclusion de certains consommateurs, la RSE s'avère désirable - dans le sens où elle augmente le bien-être social par rapport au scénario sans RSE - seulement si l'intérêt social moyen que les consommateurs portent à ces activités est suffisamment important, de façon à ce que le gain en surplus des consommateurs responsables soit en mesure de compenser la perte de ceux qui ont été exclus de la consommation du bien privé.

L'effet d'une taxe à la consommation exogène sur la décision des différents joueurs dans ce contexte est ensuite analysée. Nous démontrons que la taxe pourrait effectivement inciter le monopole à augmenter le contenu en RSE du produit. Cet effet a lieu si le rapport de la profitabilité marginale au coût marginal est plus élevé pour les activités de RSE qu'il ne l'est pour le bien privé. Nous l'appelons *l'effet de compensation* : tout se passe comme si le monopole entreprenait deux activités et que les taxes affectent, non seulement leur profitabilité absolue, mais aussi leur profitabilité relative, ce qui pousse le producteur à réallouer ses efforts d'une activité à l'autre.

En adoptant ensuite le point de vue du régulateur, nous cherchons à répondre à la question principale de cet article : faudrait-il taxer les activités de RSE ou plutôt les subventionner ? Nous considérons alors un jeu séquentiel entre un régulateur, un monopole et des consommateurs hétérogènes. Dans un premier temps, le régulateur décide du niveau de la taxe à la consommation (ou subvention) qui sera imposée sur le prix du bien offert par le monopole, tenant compte de la nature de l'interdépendance entre l'investissement privé (RSE) et l'investissement du gouvernement dans le bien

public. Dans la seconde étape du jeu, le monopole, étant donné le niveau de la taxe, décide simultanément du montant de sa contribution au bien public par unité vendue et du prix du *bien public impur* qu'il offre sur le marché. Chaque consommateur, étant donné son niveau d'engagement social ou d'altruisme et l'utilité de prestige qu'il pourrait tirer de la consommation du bien, prend sa décision d'achat<sup>10</sup>. Finalement, le rendement de la taxe est réinjecté par le gouvernement sous forme d'investissement dans le bien public, ainsi que le montant d'investissements en RSE promis par le monopole, résultant alors en un certain niveau de bien public total dans l'économie dont jouissent l'ensemble des consommateurs.

Le résultat central de cet article est qu'il est optimal de subventionner les biens avec RSE dans le cas où les activités de RSE consistent à fournir un bien public substituable à celui fourni par l'Etat. Quand ces investissements complètent, et non remplacent, l'investissement du gouvernement dans le bien public, une taxe positive à la consommation est optimale en termes de bien-être tant que les conditions du marché sont relativement favorables pour le producteur. En d'autres termes, il est optimal de taxer les biens à contenu RSE à moins que le producteur ne soit assez inefficace dans la production du bien privé, que celui-ci soit faiblement demandé sur le marché ou qu'il n'y ait pas d'intérêt social suffisamment fort pour les activités de RSE. A titre d'exemple, une entreprise investissant une part de ses recettes dans la construction d'une école pour les enfants défavorisés dans un quartier pauvre devrait bénéficier d'exonérations fiscales ou de subventions, tandis qu'une autre dont la RSE consiste plutôt en un volontariat payé de ses employés pour partager leur expertise professionnelle avec les enfants scolarisés dans des établissements publics ou y faire du tutorat devrait plutôt subir une taxe sur son produit.

Dans ce dernier cas, *la taxation du comportement éthique* - c'est à dire les biens avec contenu RSE - pourrait être perçue comme une taxation progressive ou un *moyen de redistribution*. Sous l'hypothèse que l'engagement social ou le degré d'altruisme des consommateurs est positivement corrélé à leur niveau de revenu, et donc que les plus riches ont un consentement à payer plus fort pour la contribution au bien public à travers la RSE, une augmentation d'impôts sur le bien avec RSE en fait de plus en plus un produit de niche et restreint son achat aux consomma-

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<sup>10</sup>sachant que la demande dans notre modèle est unitaire.

teurs les plus riches qui payent alors une taxe plus importante afin de rendre le bien public disponible pour tous. Ainsi, on peut, par analogie lointaine avec la théorie du double dividende, interpréter comme un bénéfice auxiliaire la redistribution que permet de réaliser la taxation du bien avec un contenu en RSE<sup>11</sup>. Il est évident que, dans ce scénario, les investissements en RSE subissent un effet d'éviction par l'investissement public. Toutefois, un certain degré d'éviction est nécessaire pour financer l'investissement du gouvernement que la RSE vise à compléter en premier lieu et donc accroître la productivité des deux types d'investissement conjoints.

Finalement, nous comparons les niveaux de taxe choisis pour différents objectifs du régulateur. Nous nous intéressons particulièrement à deux objectifs : celui de la maximisation des recettes fiscales et celui de la maximisation du bien public. Alors que le premier vise à introduire dans l'analyse l'aspect "corruption", le second vise à analyser la possibilité d'utiliser une taxe pesant sur la RSE comme un instrument efficace pour augmenter la quantité de bien public dans les économies où celui-ci est fourni en quantité insuffisante. En effet, nous concluons que, dans les économies à faible infrastructure économique et sociale, une bonne stratégie de développement serait de taxer les biens liés à la RSE ce qui permet une réallocation des dépenses de la sphère de la RSE vers celle de l'investissement public, quelle que soit la nature de l'interdépendance entre les deux formes d'investissement, pourvu que les conditions du marché soient favorables pour le producteur comme précédemment discuté. Evidemment, ceci serait au prix de moindres profits pour la firme et d'une moindre utilité de *warm-glow* pour les consommateurs. Le niveau du taux de taxe choisi est le plus bas dans le cas d'un gouvernement bienveillant ou planificateur social, il est le plus élevé dans le cas d'un gouvernement Léviathan qui cherche à maximiser les recettes fiscales et a une valeur intermédiaire quand l'objectif du régulateur est la maximisation du bien public.

L'une des pistes de recherche suggérées par ce chapitre est l'analyse du cas où le régulateur lui-même est un Homme d'affaires-Politicien, c'est à dire un cas où les firmes sont en mesure de fixer les règles du jeu en termes de RSE. La *réputation* jouant un rôle important dans ce contexte, le contenu de la RSE en tant que signal devrait être explicitement inclus dans le modèle. Cette recherche fait l'objet du

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<sup>11</sup>sans toutefois analyser la taxe distortionnaire que la taxation de la RSE permet de réduire.

## RSE, Bénéfices Politiques et Réputation

Comme cela a déjà été mentionné dans l'introduction, la RSE peut être motivée par l'information imparfaite comme source de défaillance du marché. Le Chapitre 2 explore cet aspect particulier en supposant que les *firmes sont hétérogènes*. Plus précisément, nous considérons un modèle où les firmes varient dans deux dimensions : (i) leur bienveillance ou motivation morale et (ii) leur cupidité politique ou degré d'opportunisme, sous l'hypothèse que l'engagement en activités de RSE permet à l'entreprise de tirer certains bénéfices politiques. Par exemple, entreprendre des activités de RSE facilite à l'entreprise l'accès à un réseau politique plus large et/ou une régulation moins stricte. Dans le cas extrême des Hommes d'affaires-Politiciens, contribuer au bien public à travers l'entreprise privée permet au politicien d'accroître sa popularité et donc ses chances d'être réélu.

Les firmes font un choix binaire de participation à la RSE. Les vraies motivations derrière le choix de la firme étant son information privée, les consommateurs essaient de les inférer à travers la seule décision de participation ou d'abstention, étant donné le niveau de gains politiques accompagnant les pratiques de RSE dans l'économie qui, lui, est connu par tous les joueurs. Une hypothèse centrale dans notre analyse est que les firmes tiennent à mettre en valeur leur *réputation*. En effet, une firme peut tirer des bénéfices monétaires stratégiques de la RSE sur les marchés financier, public, social, du travail et des produits si ces activités lui permettent d'être perçue comme pro-sociale. Ce constat a été confirmé par plusieurs travaux. Une firme dite *responsable* arrive à attirer les fonds des investisseurs ayant des préférences sociales, à préempter les lois et réglementations futures ou en influencer le contenu, à éviter la pression sociale et la menace des activistes, à attirer des employés moralement motivés et enfin à différencier son produit et donc augmenter sa demande.

Par souci de simplicité, nous supposons que la réputation de la firme détermine sa demande. Cette hypothèse nous paraît plausible. D'une part, une entreprise déviant d'une certaine norme sociale telle que la protection environnementale, une politique de personnel saine ou la prévention du travail des enfants risque de faire

face à une sanction de la part des consommateurs sous la forme de boycotts, et donc une réduction de la demande. D'autre part, les enquêtes menées auprès des consommateurs montrent que la réputation de l'entreprise détermine la propension de ces derniers à payer pour ses produits.

En outre, les consommateurs dans notre modèle s'intéressent, non seulement à la simple participation de la firme aux activités de RSE, mais aussi aux vraies motivations derrière cette décision. Les activités de RSE d'une entreprise à forte motivation morale sont supposées être plus soutenables et mieux ciblées. Parties intégrantes de la culture et de la stratégie de l'entreprise, elles sont orientées vers les parties prenantes prioritaires et sont caractérisées par la continuité, non par les circonstances, ce qui distingue les firmes responsables des firmes opportunistes. Ainsi, en s'engageant dans un processus d'inférence bayésienne, les consommateurs tiennent compte des motifs politiques derrière le choix de l'entreprise, compte tenu du niveau de gains politiques qui prévaut dans l'économie.

Nous considérons un jeu séquentiel dans lequel le niveau des gains politiques est exogène. Dans la première étape, chaque firme observe la réalisation de son *type* ou identité - sa motivation morale et sa cupidité politique - suivant une certaine distribution dans l'économie, qui devient son information privée, et décide soit de s'engager dans des activités de RSE, soit de s'en abstenir. Dans la seconde étape, les consommateurs observent le choix de chaque firme et mettent à jour leurs croyances à priori concernant la vraie identité de chacune, qui se traduit alors par un rendement réputationnel.

Deux principaux résultats émergent de l'analyse. En principe, introduire le politique dans le domaine des activités économiques réduit la puissance de la RSE en tant que signal de bienfaisance. Le résultat novateur est que cet *effet pervers du politique s'atténue au fur et à mesure que les gains politiques accompagnant la RSE deviennent plus importants, quelle que soit la distribution des types des entreprises*. Autrement dit, plus les faveurs politiques accordées aux hommes d'affaires sont importantes, plus faible est la sanction réputationnelle qu'ils subissent. Par ailleurs, il existe un certain niveau de bénéfices politiques à partir duquel l'effet négatif du politique disparaît voire, pour certaines distributions particulières, est inversé : une augmentation de ceux-ci n'altère plus, ou même met en valeur, la réputation des

firmes entreprenant des activités de RSE. C'est le cas des économies où les firmes sont en moyenne plutôt opportunistes.

Dans ce cas, les consommateurs ont tendance à accepter plus facilement l'idée que les firmes aient des liens politiques forts. Par conséquent, en dépit du fait que la participation à la RSE permet un nombre accru de bénéfices politiques aux entreprises participantes, celles-ci ne voient pas leur réputation atteinte (elle peut même être mise en valeur pour certaines distributions, le rendement de la RSE étant alors croissant). La part des motivations attribuées à la cupidité politique par les consommateurs est alors en diminution. Nous appelons cet effet *la corruption devenant une norme sociale*. Dans ce sens, la corruption est à la fois contextuelle et relative ; les faveurs politiques perçus comme "substantielles" dans une économie peuvent être qualifiées d' "ordinaires" dans une autre.

L'intuition derrière ce résultat est la suivante. Au fur et à mesure que les bénéfices politiques accompagnant la RSE augmentent, de nouvelles entreprises qui s'en abstenait décident de s'y engager. La réputation de ces nouveaux entrants est déterminée par (i) les gains non-réputationnels qui recommanderaient un certain comportement et (ii) les caractéristiques du pool existant des participants. Partant d'un faible niveau de gains politiques (ou également d'un faible niveau de corruption si l'on admet la corrélation entre les deux), une augmentation de ces derniers attire alors les mauvais types. Le pool des participants étant *responsable* au départ et les gains politiques étant trop faibles pour convaincre l'entreprise "moyenne" de s'engager à la RSE, ces nouveaux entrants ont un effet négatif sur la totalité des firmes participantes. Après un certain nombre d'augmentations, on pourrait être sûr que les mauvais types font déjà partie du pool des participants, et s'il y a de nouveaux entrants c'est parce que les gains directs sont tellement importants que participer à la RSE devient le choix rationnel de tout type d'entreprise, y compris les plus opportunistes mais aussi les plus bienveillantes. En un sens, les nouveaux entrants ne détériorent pas le pool des participants, au contraire même, ils peuvent l'améliorer.

Ce résultat est dû au fait que, dans notre modèle, la réputation des entreprises est formée selon un processus d'inférence bayésienne. *Le fait que les consommateurs croient à priori que les hommes d'affaires dans les économies corrompues abuseraient*

*probablement de la RSE réduit en effet la sanction en termes de réputation qu'ils subissent lorsque cet abus a lieu.* Ainsi, dans les économies où le marchandage politique est assez fréquent dans l'activité économique, et donc où le degré de corruption est élevé, la réputation n'est pas un moyen efficace pour empêcher les politiciens d'exploiter leurs activités de RSE pour des fins politiques.

Afin d'analyser le cas extrême des Hommes d'affaires-Politiciens, où les firmes ont l'occasion de se fixer les règles du jeu, le modèle est étendue pour permettre à un joueur appelé *l'Elite* - supposée être l'une des firmes, dont la position d'élite résulte du hasard - de décider à la fois du montant de gains politiques accordés aux entreprises s'engageant dans des activités de RSE et de sa propre participation. Il est à noter que pour cette variante du modèle, on suppose que la motivation morale et la cupidité politique des entreprises dans l'économie suivent deux distributions uniformes indépendantes. L'identité de l'Elite est supposée être non observable par les consommateurs alors que son choix de gains politiques l'est. Cette hypothèse est faite pour tenir compte de la réalité dans de nombreuses économies où les citoyens voient clairement que la politique publique sert les intérêts d'une certaine élite sans pouvoir identifier clairement qui l'a détournée ou l'a influencée. Dans les économies développées, ceci revient à supposer qu'il existe un grand nombre de firmes à influence politique substantielle et aux intérêts divergents, de manière que, à chaque fois que le jeu a lieu, une seule firme - ou un groupe organisé de firmes, soit un groupe d'intérêt ou un lobby - réussit à diriger la politique publique à son propre profit.

Dans le contexte d'une économie en développement, l'interprétation serait que les Hommes d'affaires-Politiciens qui sont en mesure d'influencer la politique publique tendent à cacher cette capacité aux consommateurs qui sont en même temps leurs électeurs sur le marché politique de façon à ne pas réduire leurs chances d'être réélus. Le résultat majeur de cette extension du modèle est que, *dans les économies où l'Etat est sujet à la capture par l'élite, les Hommes d'affaires-Politiciens parviennent à exploiter leur influence politique pour forger, dans leur propre intérêt, la façon dont les consommateurs perçoivent les firmes tirant des gains politiques de la RSE.* Ils introduiraient alors des faveurs politiques importantes dans la sphère de la RSE de façon à inclure dans le pool des participants les firmes les plus opportunistes et les plus bienveillantes, la cupidité politique devenant alors la norme et la réputation cessant

d'avoir un effet disciplinant contre l'abus de la RSE. L'élite réalise ainsi des gains politiques importants sans subir de pertes en termes de réputation. La mauvaise nouvelle pour ces économies est que même une élite ayant une cupidité politique nulle et donc n'entreprenant pas d'activités de RSE tiendrait à introduire des gains politiques élevés dans la sphère de la RSE : la plupart des firmes participant à la RSE, l'abstention devient un acte de firmes bienveillantes et confère un rendement réputationnel important, celui de la distinction.

Dans cet article, nous considérons une seconde variante du modèle, celle où l'incertitude a une seule dimension. Toutes les firmes ont le même degré d'opportunisme politique, elles ne diffèrent que par leur motivation morale. L'accent est alors mis sur *l'effet de la forme de la distribution* du degré de bienveillance des firmes sur la réputation et, par conséquent, sur la décision de participation des firmes. A travers un simple exercice de dominance stochastique, nous trouvons que plus les firmes dans l'économie sont en moyenne du type bienfaisant, plus le nombre de participants à la RSE est important. De même, lorsque le degré de bienveillance des firmes dans l'économie se réduit, le nombre d'entreprises s'abstenant augmente. Nous interprétons ce résultat dans le cadre de l'analyse de Bénabou et Tirole (2006). Dans le premier cas, un effet de complémentarité stratégique se produit entre les décisions des entreprises : quand la moyenne de bienfaisance est assez importante, chaque firme qui décide d'entreprendre des activités de RSE réduisant l'honneur que confère la participation à ces activités tout en augmentant le stigmate lié à l'abstention, puisque seuls les moins bienveillants font ce choix. Pour des distributions croissantes de bienveillance, la perte réputationnelle est tellement importante que la firme marginale qui préférerait s'abstenir se trouve obligée de participer de peur d'être stigmatisée. Elle entraîne la firme voisine par le même mécanisme et ainsi de suite. La condition pour avoir un équilibre unique intérieur et stable est que la densité de la distribution ne soit pas fortement croissante, de façon à ne pas rompre le mécanisme de la complémentarité stratégique. Un second scénario envisageable est celui de la substitution stratégique qui se produit lorsque la distribution de bienveillance est décroissante et donc l'économie est plutôt composée d'entreprises à faible degré de bienfaisance. Dans ce cas, les firmes participant à la RSE gagnent l'honneur de la participation tout en produisant une externalité pos-

itive pour celles qui s'abstiennent ; la RSE devient un acte de firmes extrêmement bienveillantes et non pas une pratique commune. Celles qui n'y participent pas ne sont pas stigmatisées alors.

Nous mobilisons les résultats de cette analyse pour comparer la configuration des activités de RSE en Europe et aux Etats-Unis. Dans la plupart des pays européens, les entreprises ne s'engageant pas dans la RSE sont négativement jugées. Elles font face fréquemment à des boycotts et protestations de la part des consommateurs et des ONG. Aux Etats-Unis, la RSE est perçue comme une pratique réservée aux grandes entreprises, qui sont alors les plus renommées<sup>12</sup>. Nous soutenons que cette différence de configuration est expliquée, au moins en partie, par la forme de la distribution de la bienveillance des firmes dans chaque économie. En Europe, sous l'effet de la tradition catholique ou d'autres facteurs culturels, les entreprises sont en moyenne bienfaitantes, l'effet de complémentarité domine, les entreprises s'engagent dans la RSE pour éviter le stigmate. Par contre, aux Etats-Unis, comme seul un petit nombre d'entreprises ont intégré la RSE dans leur culture, ces pratiques deviennent un acte de distinction auquel seules les plus bienveillantes peuvent s'engager. Alors que le premier effet est accentué par le fait que de nombreuses pratiques de RSE sont imposées par les gouvernements et institutions européens (ce qui réduit alors l'honneur de la participation), le second effet, celui de la substitution, est mis en valeur par le fait que le marché américain est, dans une certaine mesure, dérégulé. Ainsi les entreprises, ciblant par leurs activités de RSE les lacunes délaissées par l'Etat, parviennent à augmenter l'honneur de la participation et à lui conférer un caractère élitiste.

Dans l'ensemble, cet article explique alors différentes configurations de RSE et son contenu en tant que signal selon les scénarios. Il explique ainsi pourquoi dans certaines économies il est acceptable que la RSE permette des gains politiques alors que dans d'autres de telles pratiques seraient très mal perçues et donc le marchandage politique y est restreint. Il explore le cas de capture par l'Elite et comment les Hommes d'affaires-Politiciens détermineraient leurs propres règles du jeu. Il explique enfin, loin de l'aspect politique et corruption, la perception différente de la RSE entre deux économies développées sous le simple effet de la distribution des

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<sup>12</sup>Une comparaison détaillée de la configuration de la RSE ainsi que du degré de participation à ces activités dans les deux groupes est présentée dans l'article.

types des firmes.

## L'Effet Domino de la Corruption : Un Jeu entre le Politicien et le Bureaucrate

Le Chapitre 3 développe un aspect différent de la question de l'influence politique. Alors que le Chapitre 2 explore le cas extrême d'influence, celui du mélange des genres entre le statut d'Homme d'affaires et celui de Politicien, le présent chapitre analyse la forme plus faible d'influence qu'est la corruption : celle où les hommes d'affaires offrent des pots-de-vin aux politiciens et aux bureaucrates afin de détourner la politique publique à leur intérêt. Il permet ainsi de répondre à des questions telles que : quelle est l'incitation pour un agent à accepter un pot-de-vin ? L'interdépendance entre les tâches des différents organismes du gouvernement favorise-t-elle, ou au contraire, freine-t-elle la propagation de la corruption ? A qui le corrupteur aurait-il le plus intérêt à offrir un pot-de-vin ? Comment protéger les agences gouvernementales contre le risque de corruption ?

Nous considérons un jeu d'aléa moral entre un politicien et un bureaucrate, dont les efforts sont interdépendants, compléments ou substituts, dans un certain projet public. Il est possible qu'un pot-de-vin *exogène* soit offert par un certain homme d'affaires, soit au politicien - pour pousser la politique publique dans une certaine direction qui sert son intérêt privé, pour obtenir une certaine législation ou pour détourner des fonds publics-, soit au bureaucrate - pour diriger ses efforts vers l'exécution du projet particulier auquel s'intéresse l'homme d'affaires plutôt que de déployer son effort dans l'exécution du projet public. Chacun des deux joueurs a une certaine propension à accepter le pot-de-vin qui est son information privée et qui suit une certaine distribution connue à priori par tous.

Ce modèle simple génère un résultat novateur et central : *il est toujours plus facile de corrompre un joueur dans une équipe qu'il ne l'est de corrompre un joueur individuel, quelle que soit la nature de l'interdépendance des efforts au sein de l'équipe, et quelle que soit la forme de la distribution des propensions à accepter le pot-de-vin des joueurs.* Intuitivement, dans le cas de la complémentarité, un pot-de-vin offert au bureaucrate réduit sa probabilité, telle que perçue par le politicien,

de déployer l'effort dans le projet public. Le bureaucrate, anticipant alors ce raisonnement de la part de son co-travailleur, estime moins probable que ce dernier fasse l'effort à son tour, comme il lui serait plus difficile d'atteindre le bon résultat en solo, et donc ses incitations à déployer l'effort diminuent davantage sous le seul effet des anticipations stratégiques. Dans le sens où le pot-de-vin réduit la probabilité des deux joueurs à déployer l'effort dans le projet public, nous parlons d'*effet domino dans le cas de la complémentarité* ou *effet de château de cartes* ; la diminution des incitations d'un membre de l'équipe à travailler entraîne la diminution de celles de tous les autres membres au sein de la même équipe.

En revanche, dans le cas de la substitution, un pot-de-vin offert au bureaucrate réduit ses incitations à déployer l'effort mais augmente celles du politicien pour compenser la mauvaise performance de son co-travailleur puisqu'il pourrait quand même atteindre le bon résultat de sa propre initiative. Ceci réduit davantage les incitations du bureaucrate à déployer l'effort puisqu'il sait qu'il pourrait dépendre des efforts du politicien. L'effet accentué du pot-de-vin dû à la simple appartenance à une équipe est toujours présent, par contre, dans ce cas, il n'y a pas d'effet domino puisque la diminution de la probabilité du récepteur du pot-de-vin à déployer l'effort suscite un *contre effet* de la part de son collègue.

Le mécanisme dans le cas de la complémentarité fournit une interprétation stratégique au phénomène de la "corruption épidémique" ou encore celui de la "corruption auto renforçante" fréquemment discutés dans la littérature. Il est alors possible que, au sein d'un certain gouvernement, les agences tendent à choisir un niveau d'effort nul (et donc à détourner leurs efforts vers d'autres projets non publics), non pas parce qu'ils arrivent à obtenir des pots-de-vin sans être détectés ni parce qu'ils ont l'habitude de faire des transactions avec des individus corrompus, ce qui est devenu la norme, mais simplement parce que leurs efforts sont interdépendants avec ceux d'autres agences qui sont, eux, susceptibles d'accepter des pots-de-vin. La réponse stratégique rationnelle dans ce cas serait de ne pas déployer l'effort puisqu'en tout cas, le résultat souhaitable ne serait pas atteint.

Un corrupteur potentiel, l'homme d'affaires, est ensuite introduit dans le modèle pour endogéniser le choix du montant du pot-de-vin. Cette extension du modèle vise à analyser la question de l'influence politique par le biais du pot-de-vin. Sup-

posons que si le politicien fournit un effort nul dans le projet public ou, de manière équivalente, choisit le niveau bas du bien public, il arrive à détourner des fonds publics pour servir les intérêts de l'homme d'affaires. Par exemple, au lieu de construire une école publique, les fonds seraient utilisés pour construire une autoroute qui mène à son usine. Supposons aussi que si l'administration détourne ses efforts, elle pourrait déployer ses ressources plutôt dans l'exécution de ce projet d'autoroute. Dans ce contexte, il est dans l'intérêt du corrupteur de détourner les efforts des deux agents. A qui devrait-il alors offrir un pot-de-vin plus important ?

Notre analyse montre que, dans le cas de la complémentarité, le corrupteur a intérêt à cibler par le pot-de-vin le joueur qui reçoit la rémunération la plus faible dans le projet public, alors que dans le cas de la substitution, il ciblerait plutôt celui qui est le plus rémunéré. La première partie de ce résultat est cohérente avec l'idée que les agents les moins rémunérés sont les plus susceptibles d'accepter les pots-de-vin. Cependant, nous présentons une interprétation différente. Un pot-de-vin offert au joueur le moins payé provoque une réaction stratégique plus forte de la part de son co-travailleur qui, lui, a un gain important en enjeu de la relation de complémentarité et donc devient de moins en moins incité à déployer l'effort. Dans ce sens, *un pot-de-vin offert au joueur le moins payé engendre l'effet domino le plus fort* et, par conséquent, minimise le coût de la corruption pour l'homme d'affaires. En revanche, dans le cas de la substitution, en vue de minimiser le coût total de la corruption, il vaudrait mieux offrir le pot-de-vin à l'agent le mieux payé, engendrant ainsi un contre effet faible, qui serait facilement contrebalancé par un montant faible de pot-de-vin offert au co-travailleur.

## Principales Contributions

Les trois chapitres de cette thèse développent différents modèles pour traiter sous des angles complémentaires la question de la provision du bien public par les entreprises et l'influence politique. Ce faisant, des contributions ont été apportées à différents champs de la littérature.

Les Chapitres 1 et 2 contribuent à la littérature sur la RSE. Le Chapitre 1 introduit dans la littérature sur la RSE et la régulation l'idée de taxer les produits verts ou responsables – plutôt que de les exonérer de taxes ou de les subventionner – comme moyen de redistribution lorsque le rendement de la taxe peut être recyclé sous forme de provision du bien public par le gouvernement. Ce chapitre met ainsi l'accent sur la possibilité d'exploiter la propension des consommateurs à payer pour les activités de RSE pour maximiser le niveau du bien public fourni dans l'économie, compte tenu de la nature d'interdépendance entre les investissements privé et public. Dans ce sens, il montre comment la politique publique est en mesure d'influencer les investissements en RSE. Le Chapitre 2 examine la relation dans la direction opposée, plus précisément, il montre, dans le contexte d'entreprises ayant des liens politiques, comment les investissements en RSE peuvent affecter le niveau du bien public fourni par le gouvernement.

En utilisant le cadre de la RSE et des bénéfiques politiques, le Chapitre 2 contribue à la théorie des jeux de signaux en montrant que, pour toute distribution indépendante des motivations intrinsèques et extrinsèques, la sanction en termes de réputation accompagnant les incitations matérielles ou monétaires s'atténue au fur et à mesure que ces incitations deviennent plus importantes. Dans le problème d'un signal à plusieurs dimensions, pour des niveaux suffisamment élevés d'incitations matérielles, les observateurs cessent d'attribuer la décision de participation de l'agent à la partie extrinsèque des motivations, soulignant alors comment l'asymétrie de l'information peut jouer en faveur des types les plus opportunistes.

Cette thèse apporte enfin de nouveaux éléments à la littérature sur l'influence politique et la corruption. Alors que le second chapitre considère le cas extrême des Hommes d'affaires-Politiciens où les firmes mettent en place les règles du jeu, le Chapitre 3 analyse une forme moins prononcée d'influence politique, celle où les firmes visent à affecter l'orientation ou le contenu de la politique publique à

travers les pots-de-vin. Sur le plan théorique, ce chapitre fournit une interprétation stratégique de la corruption, montre à qui le corrupteur aurait tendance à offrir le pot-de-vin et les incitations optimales qui devraient être mises en place pour protéger contre la menace de la corruption.

Pour résumer et rassembler les conclusions des différents chapitres en une réponse globale à la problématique posée par cette thèse, les activités de RSE ont la capacité de corriger la défaillance de l'Etat dans la provision du bien public, mais aussi d'en être la cause (à travers le canal de l'influence politique). Le régulateur pourrait opter pour la provision de certains biens publics par les entreprises et donc promouvoir les pratiques de RSE par des exonérations fiscales ou des subventions. Ceci est surtout le cas quand l'investissement privé en RSE est en mesure de remplacer l'investissement public du gouvernement. Toutefois, lorsque les deux formes d'investissement sont plutôt complémentaires, le gouvernement pourrait intervenir pour corriger la défaillance du marché, avec RSE, par le biais des taxes.

Dans le contexte où les entreprises exercent *directement* une influence politique, le cas des Hommes d'affaires-Politiciens, la provision du bien public serait réduite pour maximiser les rendements, en termes de réputation, sur les investissements en RSE. Cet effet est d'autant plus prononcé que le coût du marchandage politique ou de la capture de l'Etat est faible. La forme *indirecte* d'influence politique, à travers l'offre d'un pot-de-vin, pourrait également aboutir à la réduction du bien public fourni par le gouvernement. Ce mécanisme est d'autant plus fort, et donc le coût du pot-de-vin d'autant plus faible, que les efforts des différents organismes du gouvernement sont interdépendants ou également que le système est fortement bureaucratique. Dans ce cas, la propension des agents à accepter le pot-de-vin est stratégiquement renforcée.

## Implications de Politique Publique

Du point de vue des politiques publiques, cette thèse conduit à des recommandations relatives à la désirabilité d'exonérations fiscales accordées à la RSE ainsi qu'aux moyens de réduire l'influence politique et d'atténuer son impact négatif sur la provision du bien public par le gouvernement.

En effet, cette recherche montre que la politique fiscale vis-à-vis des activités de RSE devrait être évaluée à l'aune des objectifs de la politique publique. En accordant un même traitement aux différentes pratiques de RSE, le régulateur risque de laisser échapper des opportunités de gains de surplus importants. Il semble donc approprié que l'agenda du gouvernement précise un certain nombre de biens publics prioritaires et, selon la nature de l'interdépendance entre l'investissement public dans ces biens et l'activité de RSE en question, le niveau de la taxe ou de la subvention optimale qui sera accordée à cette activité particulière devrait être déterminé. Par ailleurs, l'objectif de la politique publique devrait également être pris en compte. Par exemple, si dans une économie un certain bien public est fourni en quantité insuffisante et s'il existe une forte inégalité des revenus, une bonne stratégie, qui aurait à la fois un effet de redistribution et de mise en valeur du bien public, serait de taxer les biens avec contenu RSE, surtout lorsque ces activités sont complémentaires à l'investissement du gouvernement<sup>13</sup>.

L'influence politique exercée par les entreprises, sous ses différentes formes, sur la politique publique mène à une défaillance de l'Etat dans la provision du bien public. Une question fondamentale pour le régulateur est alors de réduire cette influence. D'une part, le phénomène des Hommes d'affaires-Politiciens devrait être restreint. Des contraintes légales devraient être imposées sur les activités économiques des politiciens, agents publics et fonctionnaires de l'Etat. En effet, tel est le cas dans certaines économies. A titre d'exemple, aux Etats-Unis, les membres du Congrès ne sont pas autorisés à concilier affaires et politiques durant leur mandat. Dans la mesure où les hommes d'affaires cherchent à s'insérer dans la vie politique dans le but de réduire le coût de leurs activités de lobbying auprès des agents publics, un moyen important de limiter ce phénomène serait de renforcer les institutions qui tiennent les représentants élus responsables de leurs actes face aux électeurs et qui leur demandent des comptes - telles que les médias et la transparence du gouvernement - et qui augmentent alors le coût de renier leurs promesses électorales.

D'autre part, l'influence politique à travers les pots-de-vin offerts aux fonctionnaires publics et politiciens devrait être limitée. Pour ce faire, il est nécessaire de limiter la dépendance du processus de production des biens publics ou des projets

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<sup>13</sup>et, sous certaines conditions, lorsqu'elles peuvent s'y substituer.

publics en général à la coordination entre les différents organismes du gouvernement, au contraire de ce qui se produit dans les systèmes extrêmement bureaucratiques, surtout en l'absence de règles rigoureuses de contrôle de surveillance. La mise en place d'organismes faiblement liés entre eux - voire indépendants tels que la Banque Centrale, l'Agence de la Protection de l'Environnement aux Etats-Unis et la majorité des agences de régulation en Europe - les rend moins vulnérables à l'effet domino induit par le pot-de-vin et qui résulte essentiellement d'un climat général de méfiance. A moins que les agents publics aient une tendance assez faible à être corrompus, par exemple s'ils ont été nommés pour ces postes particuliers pour leur réputation, trop mettre l'accent sur la complémentarité, ou la substitution d'ailleurs, entre les différentes organisations du gouvernement accroît le risque de la corruption, ouvre la voie à l'influence politique et réduit éventuellement la provision du bien public.

## Limites et Voies de Recherche Futures

Parmi les questions qui n'ont pas été abordées par cette recherche, figure l'analyse du choix des activités de RSE par l'entreprise. Les firmes choisissent-elles de contribuer aux biens publics pour lesquels elles sont en mesure de tirer parti de leur expertise technique ? Ou la RSE est-elle plutôt perçue comme un outil de publicité, le bien public dans lequel elles investissent dépendant alors du goût de leur clientèle particulière ? Evidemment, l'impact social et économique, aussi bien que les moyens d'intervention du régulateur, seraient différents d'un cas à un autre. Un projet de recherche similaire pourrait être mené pour les firmes multinationales. Ont-elles tendance à cibler les besoins des communautés dans lesquelles elles opèrent ou adoptent-elles plutôt des pratiques de RSE *importées* dans le sens où elles seraient influencées par la culture de RSE dans leur pays d'origine ?

En outre, le même mécanisme utilisé pour analyser le problème d'extraction de signaux dans le contexte des Hommes d'affaires-Politiciens pourrait être mobilisé pour analyser la question controversée de la RSE pratiquée par les industries dites *du péché* telles que le tabac et le jeu. Finalement, cette recherche n'a pas exploré le rôle de la liberté des médias dans la réduction de l'influence politique et donc la réduction de l'impact de la RSE sur le bien public. Cette question devient encore

plus intéressante, mais aussi plus complexe, une fois que la possibilité de contrôle des médias par l'élite est prise en compte. Dans ce contexte, quel rôle les médias sociaux pourraient-ils assurer ?

De nombreux mécanismes et controverses dans le domaine de la RSE n'ont pas encore été dévoilés. L'évolution de la nature de ces activités ainsi que les contextes variés de leur émergence ouvrent des voies de recherche prometteuses et potentiellement intéressantes pour évaluer la redistribution des rôles entre l'Etat et le marché.

# Introduction

On January 25, 2011, thousands of Egyptians poured into Tahrir Square, the symbolic heart of Cairo. This revolution was a natural result of the anger at the former president Mubarak's rule that had built up over the past decade. The protests resulted in former top state officials being sent to prison and a series of arrests and travel bans being imposed on high profile figures following the ousting of the former president's regime. These were based on several charges among which embezzlement, profiteering, bribery, misappropriation of funds and money laundering. Egyptians could hardly believe what was happening: for the first time in three decades, the public started to believe that the law is being applied to all and that no one is above the law. Opinions about the trials were divergent. Some were celebrating the rule of the law and that the revolution's primary demands, chanted at every protest "*bread, freedom, social justice and human dignity*" were finally met. Others, especially in rural areas, thought the trials were unjustified; they sympathized with the arrested politicians who were at the same time the most prominent businessmen in the economy.

The mixture of types - or what we refer to as the phenomenon of *Business Politicians* - was a dominant trait of the Egyptian economy prior to the 2011 revolution. The power of businessmen in the ruling National Democratic Party (NDP), in the government, and in the People's Assembly (Egyptian Parliament) had risen drastically during the tenure of Prime Minister's Ahmed Nazif's government. To the untrained eye, Egypt's Parliament list could easily be mistaken for a who's who of big business. The strong relation between politics and money in Egypt was obvious. To stay in one of the two clubs, you need to be a member of the other. According to varying estimates, up to a fifth of the People's Assembly were wealthy businessmen and the role of opposition was limited to that of a ruling oligarchy task. In the 2010 elections, business tycoons of the ruling National Democratic Party (NDP) got the lion's share as chairmen of the People Assembly's 19 committees. For instance, Ahmed Ezz, NDP's secretary for organizational affairs and steel magnate, was elected chairman of the budget committee for the third time since 2000; and Mohamed Abul-Enein, an industrialist and a member of NDP's secretariat-general, retained his position as chairman of the industry and energy committee for the second time since 2005.

The most interesting aspect about Business Politicians in Egypt is that they invest large amounts, through their *Corporate Social Responsibility* (CSR)<sup>14</sup> activities, in the public goods that the government, of which they are a part, tends to underprovide<sup>15</sup>. The Chairman of Mansour Group, Egypt's leading private sector conglomerate (it has distribution, sales and service businesses for autos, retail goods and industrial equipment, distributes audiovisual and household products; it sells office equipment; and distributes marine, mining, and construction equipment) was transport minister under Mubarak's regime. "Mansour Foundation for Development" engages in several CSR projects such as eradicating illiteracy, funding orphanages... etc. For instance, the water company *Hayat*, which is part of the Mansour Group, donates 8,000  $m^3$  of water daily to the locals for agricultural use. The company also donates electric power -100 kw/hr - which it generates in house and is used to power the village's school, main clinic, social services building, and the Mosque, free of charge. Following the same trend, Abou El Enein, who is also chairman of Ceramica Group, one of the largest investment groups in Egypt established in 2001 "Abou El Enein Organization for Social Activities and Charity" that undertakes literacy, improving healthcare services, supporting SMEs and female-headed households.

Does the ruling elite actually consist of benevolent businessmen who step in areas where the government fails to deliver? Or does the government fail to deliver because underprovided public goods increase the profitability or enhance the reputation of the Business Politicians? The example of the ex-secretary general of the National Democratic Party (NDP), Ahmed Ezz is quite illustrative. As part of the CSR efforts of his steel company, he would grant 30,000 beneficiaries of the "build your house" project (which are mainly low-income youth) with one ton of free steel for each one. However, as a politician, he did not contribute to solving housing problems. A priori, one would expect underprovided public goods and increased favors granted to Business Politicians to at least affect their *reputation*. Strangely and curiously enough, this was not the case. To a large sector of the public, those

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<sup>14</sup>CSR is defined as activities whereby firms contribute to sustainable development and take responsibility for their impacts on their society.

<sup>15</sup>which range from education, healthcare, access to water and electricity –or the so-called economic infrastructure – to women empowerment and human rights – or the so-called social infrastructure.

Business Politicians were the saviors of the economy. They argue that they were more efficient in giving the population what it needed.

A telling example is that, especially in rural areas where the lack of public goods is striking, electoral campaigns are fought over the number of roads, schools and hospitals each businessman candidate has financed through his private business. These practices persisted even after the revolution. During the tenure of the former president Mohamed Morsy, the leading businessmen in the Muslim Brotherhood “Freedom and Justice” Party who owned large supermarket chains donated foodstuff through their private business to poor neighborhoods as a part of the philanthropic activities of their companies, at a time where inflation had reached unprecedented rates, to promote for the party members who ran for parliament elections. The supermarket chain “Khair Zaman” owned by Khairat El-Shater, a leading member of the Muslim Brotherhood<sup>16</sup> donated sugar, cooking oil, flour and rice to citizens. The main concern of the voters then was not who let the prices rise, but rather who helped them during the inflation. Only a few painted the picture of a state where wealth fuels political power and political power buys wealth such that the influential businessmen benefit personally from their position as members of the government.

Apart from politicians using their political status to enhance their profits from the CSR investments of their private businesses, non-business politicians were influenced by the businessmen through the *bribery* channel. This phenomenon was and still is widespread in the Egyptian economy. Many ministers appointed in the mid-2000s promoted corruption on an unprecedented scale. They sold significant portions of the public sector for the benefit of a few businessmen and decreased public investment in agriculture, land reclamation, housing, education and health. In turn, they promoted private investment in rarely successful export-oriented agriculture, the construction of gated communities for the elite, and the establishment of for-profit private universities and hospitals. Meanwhile, the government was unable to provide a decent level of public goods as substantial amounts of public funds were diverted and bribery became a common disease in government agencies.

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<sup>16</sup>being the Deputy Supreme Guide, he was the initial candidate of the movement’s Freedom and Justice Party during the 2012 Egyptian presidential elections before being disqualified by the election commission.

# Research Questions

This dissertation is motivated by those three particular aspects of the Egyptian economy that led to the revolution: the relationship between CSR activities and the government provision of public goods, the concentration of powers in the hands of the elite, and the spread of corruption among government agencies. To which extent can corporates' provision of public goods complement or substitute for the government provision? Should CSR investments then be rewarded with tax exemptions or rather taxed to promote the government provision? When is the reputational channel sufficient to prevent business politicians from abusing their political stance and when should there be economic, political or legislative values to prevent such conflict of interests and limit corruption? How is the culture of bribe-taking transmitted from one agency to the other and what could be done to contain it? These questions arose from the field, in the year following the revolution<sup>17</sup>, as a new president was being elected, the constitution rewritten and the Parliament reassessed. Little academic work had been conducted at the time - and still is - on the potentiality of corporates' investments in public goods, particularly in the context of a ruling elite, and more generally in an economy where business lobbies exert some influence over public policy. This novel research on CSR, political influence and the public good provision is thus exploratory.

Each chapter tackles a different aspect of the research topic. Chapter 1 explores the question of CSR and the public good. Given the nature of interdependence between the CSR and the government investments in the public good, it contrasts scenarios in which tax exemptions accorded to CSR are desirable and others where taxing the CSR goods can have positive redistributive effects. The political influence aspect is considered in Chapter 2 where the focus of the analysis is rather shifted to the signaling content of CSR when it is accompanied by political benefits. Finally, Chapter 3 takes a slightly different standpoint by analyzing the mechanism by which corruption can be transmitted from one agency to the other.

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<sup>17</sup>the time we started working on this Ph.D.

## CSR as the Corporate Provision of a Public Good

Until recently, it was well known that markets are incapable of assuring efficient pricing of non-private goods or bads. Hence, the market would not tend to cater for the values of individuals who have preferences for a clean environment, reduction of child labor, fair trade, community development programs. . . This opinion echoes Friedman (1970) who argues that private corporations should get on with the business of making profits while governments should deal with regulating public goods and externalities. Over the past decades, this classical dichotomy between the role of the government and that of firms has been breached. Firms have been increasingly investing resources to take responsibility for their impacts on society, beyond requirements by law and regulation. Social, environmental, ethical, human rights and consumer concerns are being integrated into firms' core strategy and their business operations. Such practices are referred to as Corporate Social Responsibility, CSR hereafter.

The analysis of CSR raises two conceptual difficulties. First, CSR manifests itself in a wide variety of practices that do not necessarily involve a *pure public good*. For instance, the World Bank defines CSR as “the commitment of business to behave ethically and to contribute to sustainable economic development by working with all relevant stakeholders in ways that are good for business, sustainable development agenda and society at large”. This definition pools together a rather heterogeneous set of practices. Some involve a pure and global public good such as the reduction of carbon emissions and the avoidance of child labor. Others involve a less global one such as the donations to social causes and community development. Some could be considered as semi-pure public goods such as enhancing work conditions for employees; which is non-rival among employees of the same company but rather excludable as it only benefits the workers of this particular firm. Finally, there are CSR practices that would qualify as purely private goods such as those related to the product that the firm produces resulting in better characteristics of the product that yield private benefits only to its consumers, such as food and beverages that are free of pesticides or energy efficient appliances.

Second, there is a large set of motivations behind firms' decisions to engage

in CSR. While the existence of social preferences<sup>18</sup> is a pre-requisite for a firm to engage in CSR, there are three sources of market imperfections that would qualify as CSR drivers: externalities and public goods, imperfect competition and incomplete contracts<sup>19</sup>. Firms could engage in CSR through the provision of public goods or the curtailment of public bads either to respond to pressure exerted by NGOs and activists (referred to as the private-politics argument for CSR) or to pre-empt public regulation or reduce the cost of complying. The second source of imperfection pertains to imperfect competition; firms would then engage in CSR as a means of product differentiation to attract the socially responsible consumers, to signal its credence goods attribute or to enhance its reputation. Third, firms may resort to CSR to overcome agency problems with its stakeholders - employees, shareholders and managers - based on internal (delegated or organizational) pressure from those shareholders.

Throughout the dissertation, we give coherency to the analysis by considering CSR activities that would qualify as (semi and/or pure) public goods. Hence, the only form of CSR that is not included here is those practices related to the product itself that only benefits its consumers. This paper thus studies a rather heterogeneous group of CSR practices. The term corporate provision of public goods should be understood in the rather broad sense. We use the term CSR in preference to the narrower idea of firms contributing to the public good, which suggests a specific form of practices. Social preferences are a pre-requisite for CSR activities in our setup which are mainly driven by incomplete competition. In Chapter 1, CSR is a means by which the producer extracts the maximum of the willingness to pay of the heterogeneous consumers for CSR. In Chapter 2, we rather view CSR as a signaling device used by firms to enhance their reputation.

The following sections briefly detail each chapter, motivate its setup choice, and provide background to contextualize contributions to the CSR literature, signaling games and incentives theory.

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<sup>18</sup>such that firm's CSR activities are positively valued and demanded by at least one type of stakeholder – consumers, employees, shareholders, regulators, managers..

<sup>19</sup>Here we refer to the classification of CSR motivations presented by Crifo and Forget (2015) for the ease of exposition. A detailed review on the CSR literature will be developed throughout the chapters.

## Should CSR activities be Tax Exempted?

As a starting point, Chapter 1 lays out a theoretical framework to illustrate our understanding of CSR as activities driven by consumers' demand. A monopoly setup is considered where the firm provides a public good alongside the private one it produces. Consumers are assumed to be homogeneous regarding their valuation for the private component of the product but have heterogeneous preferences regarding its public good aspect or CSR content. The pricing strategy of the CSR product is explained and the questions of both the feasibility (whether it is profitable for the producer) and desirability of CSR (whether it is welfare-improving) are explored.

Green or responsible products are found to be *over-priced*; that is, a dollar contributed to the public good through the purchase of the CSR product costs the consumers more than one dollar as the producer charges a premium for CSR. Furthermore, increasing the CSR content in our setup amounts to increasing the price as well and thus the pool of consumers purchasing the good narrows. CSR is welfare-improving only if the average social interest in such activities is sufficiently large, so that the gain in welfare of the green consumers more than offsets the loss of the excluded ones who can no longer consume the (unbundled) private product.

The model is then extended to allow for a consumption tax set by a regulator on the CSR good. It is shown that taxes may actually increase the CSR content of the good if the marginal profitability to the marginal cost ratio is larger for CSR activities than for the private good. We refer to this as the *make-up* effect; it is as if the firm has two businesses and the taxes affects not only their absolute profitabilities, but also their relative ones. Increased taxes thus induce the firm to reallocate its efforts from one business to the other. Furthermore, tax exemptions accorded to CSR products are socially optimal when the CSR investments in question substitute for the government provision of the public good, but not when both forms of investments are complements, unless the producer is highly inefficient so that his business does not generate much revenues to extract taxes from. For instance, a firm investing part of its revenues to construct a school for underprivileged children in a poor neighborhood should benefit from tax exemptions or subsidies on its product, whereas a firm paying its employees to share their professional expertise with children enrolled in public schools should rather have their products taxed. In the

latter case, taxing ethical behaviour - in the sense of taxing the product with a CSR content - can be seen as *a means of progressive tax*. If we assume consumers' social consciousness or altruism to be correlated with income, increased taxes amount to purchase of the good being restricted to wealthier consumers who would then be paying larger taxes to make the public good available for all. Part of the CSR investments would then be redirected towards the public one, necessary to enhance the productivity of the former.

Finally, different objectives of the regulator are contrasted. The tax rate is found to be the lowest under a benevolent regulator and the largest under a Leviathan-type government that aims at maximizing the tax revenues, with the tax rate set by a public-good maximizing regulator lying in between. The objective of tax revenues maximization aims at introducing the corruption aspect into the analysis. The choice of the public-good maximization objective explores whether taxing CSR products can be an effective tool in economies with an underprovided public goods, taking into account the nature of interdependence between the CSR investments and the public good provided through the government. We find that in economies with poor social as well as economic infrastructure, a good development strategy would be to tax CSR products such that funds are re-allocated from the CSR arena to the public investment, whether both forms of investment are complements or substitutes, provided the market conditions are good (that is, the producer is sufficiently efficient, his private good strongly demanded on the market and consumers have a large willingness to pay for CSR activities). Clearly, this would be at the cost of both reduced warm-glow utility for the responsible consumers and reduced profits for the firm.

Among the research paths suggested, the analysis of the case where the regulator is a business politician, that is, when the firms get to set the rules of the CSR game. Reputation being an important variable in this context, the analysis of the signaling content of CSR would then have to be included in the model. This research is the focus of Chapter 2.

## Is CSR necessarily stained when Political Benefits come along?

As pointed out earlier in the introduction, CSR may be driven by incomplete information, which is a form of market imperfection. Chapter 2 explores this particular aspect by rather assuming heterogeneity in *firms' types*. Precisely, firms vary along two dimensions: (i) their benevolence or culture; i.e. how well CSR is integrated into a corporation's long term maximizing strategy and (ii) their political opportunism or greed, assuming that engaging in CSR allows firms to reap some political benefits (a case that was extensively illustrated in the motivation of the dissertation). Firm's type being a private information, CSR becomes a strategic signal that will determine reputation, and therefore the demand.

Introducing politics into the sphere of business negatively affects the signaling power of CSR with respect to corporate prosocial orientation. The novel finding however is that this perverse effect of politics fades away as those political benefits become larger, for any given distribution of types. That is, the larger the political favors granted to businessmen in an economy, the less reputational sanction they get. For a particular set of distributions, the image-spoiling effect of politics disappears and may even be reversed. This is especially the case in economies where businessmen are, on average, eager politicians. Consumers in these economies are likely to accept the idea of firms having political ties more easily: even though engaging in CSR allows larger political benefits, firms get an increasing reputational return on their CSR investments, that is, consumers do not appreciate their CSR efforts any less. We refer to this result as that of *Corruption as a Social Norm*. It is shown that corruption is both a relative and contextual phenomenon, what is considered as *large* political benefits in one economy may be considered trivial in another.

The intuition is the following: as larger political rewards are offered to firms engaging in CSR, more firms decide to engage in those practices. The reputation of the new entrants should be assessed given both the direct non-reputational benefits of firms that counsel a given behaviour and the existing pool of firms exerting CSR. When benefits increase, the bad types are drawn in first, so after a certain number

of increases, one can be certain that the most opportunistic types are already in, so the new entrants do not incur any reputational loss by engaging in CSR because, in a way, they are not worse than the pool of firms already exerting CSR. This is due to the reputation in our model being interpreted as a Bayesian update of beliefs about firms types. The fact that consumers believe that businessmen in corrupt economies are more likely to abuse CSR actually reduces the reputational sanction when such abuse occurs. Thus in highly corrupt economies, reputation is not an effective disciplining tool to prevent the politicians from exploiting CSR activities for political ends<sup>20</sup>.

To analyze the extreme case of Business Politicians whereby the firms get to set the rules of the game, the model was extended to allow for a player called the Elite - which is a firm that wins a lottery - to decide on both the extent of political benefits that come along CSR and whether or not to engage in CSR activities. The identity of the Elite is assumed to be unknown to consumers, even though the outcome of his choice is observable. The idea behind this particular assumption is to reflect the reality in many economies where citizens do not know who has influence over public policy. In developed economies, this amounts to assuming that there are many firms with substantial political influence and conflicting interests, so each time the game is played only one firm - or an organized group of firms - succeeds. In the context of a developing economy, this would be interpreted as the business politicians, who are able to influence public policy, tending to hide their identity from their consumers, who are at the same time electors, so as not to reduce their chances of being re-elected. The key finding is that, in highly corrupt economies where the state is most prone to capture - or equivalently where the basic public goods are underprovided - business politicians can actually exploit their political influence to forge the public view of an opportunistic firm to their own benefit: they would introduce a large amount of political benefits into the CSR sphere so that consumers are sure that all the bad types are drawn in, opportunism becomes the norm and the reputation ceases to work as a disciplining tool.

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<sup>20</sup>which, at least partly, explains why the Business Politicians in Egypt, prior to the revolution, and in many corrupt economies are being re-elected and their businesses are going well.

## How does Corrupt Behaviour Spread from One Government Agency to the Other?

While Chapter 2 considers an extreme form of political influence, that of business politicians setting their own rules of the game, Chapter 3 develops a model that analyzes a different, less pronounced form of political influence, namely, *the bribery channel*. In this chapter, corruption refers to politicians and bureaucrats receiving bribery from a businessman which induces them to shirk in a given public project. Unlike the previous chapter where the spread of the culture of corruption was due to observers' update of beliefs, its spread here is due to strategic interaction. A game, involving moral hazard between a politician and a bureaucrat whose efforts are interdependent (either complements or substitutes) is considered. There is the possibility of a bribe being offered by a businessman to either the politician, in order to push public policy in a certain direction or obtain a particular legislation or divert public funds, or the bureaucrat, to direct his efforts to serving the businessman's interests. The novel result obtained is that, it is always easier to bribe a player in a team rather than a single player. Bribery offered to one player has a domino effect on the whole team in the sense that not only does it reduce the incentives to exert the effort for the player who receives it, but also those of the other players in his team.

This finding provides a strategic explanation to the *epidemic corruption* or *self-enforcing* corruption. It is thus possible that, within a given government, agencies have tendency to shirk not because they can accept bribery without being caught or because they are simply used to dealing with corrupt people that it became the norm, but simply because their efforts are interdependent with some other agencies who are known to be corrupt. So the rational strategic response would be to shirk, even without receiving bribery. Furthermore, this result holds whether efforts are complements or substitutes and for any prior beliefs each player may hold about his co-worker's propensity to accept bribery.

A potential corruptor, a businessman, is introduced into the model to endogenize the choice of bribery. The aim of this extension is to analyze the question of *political influence and public good*. Suppose for instance that if the Politician provides the low

level of public good, he can divert the public funds to serve the interests of a certain businessman, by constructing a highway that leads only to his factory. Furthermore, suppose that if the Administration shirks, it can direct all its effort to constructing this highway instead of contributing to the public good provision. It is then in the businessman's interest to corrupt both the Politician and the Bureaucrat to divert their efforts from the public good provision to the project that solely benefits him. Alternatively, in line with Chapter 2, one could think of the corruptor as being a firm wishing to influence the politician so as not to provide a certain public good, making its CSR activities more valuable. Finally both players' shirking may simply refer to not carrying out a public project that could have harmed the corruptor's private business, such as a certain legislation on taxes.

It is shown that the corruptor would tend to bribe the less-paid player when efforts are complements and the better-paid one when they are substitutes. The first part of the result is consistent with the idea that lower-paid agents are more vulnerable to bribery. Our interpretation however is different: bribing the player with the lower payoff induces a strong response from his co-worker who, on the other hand, has a large gain at stake from the complementarity and hence becomes even more likely to shirk, without being bribed. Back to our example, if the bureaucrat receives a bribe, the politician's probability of carrying on with the road construction falls as he know he cannot achieve the high outcome on his own, thus generating the strongest domino effect. In contrast, in the substitution case, it is in the corruptor's interest to bribe the better-paid agent because then he generates the lowest counter effect of bribery on the co-worker (whose probability of exerting the effort increases) and hence minimized the bribe that would have to be offered to the latter to have both players divert their efforts.

## **Main Findings and Contributions**

The three chapters of this dissertation tackle from various angles the question of the corporate provision of public good and political influence. Doing so, contributions were made to different fields of the literature.

Contributions to the CSR literature were made in Chapters 1 and 2. Chapter 1

introduced into the literature on CSR and regulation the idea of taxing – rather than exempting – the green products as a means of redistribution when the tax proceeds can be recycled in the form of government provision of a public good. This chapter thus highlighted the potentiality of exploiting consumers’ willingness to pay for CSR to further enhance the public good provision, once the nature of private and public investments into the latter are taken into account. In this sense, it shows how public policy can affect CSR investments. Chapter 2 examined the relation in the opposite direction, namely, how CSR investments of firms can affect the government provision of public good, in the context of politically connected firms.

Using the CSR and political benefits framework, Chapter 2 also contributed to signaling theory by showing that, for all distributions of extrinsic and intrinsic motives, the reputational sanction that comes along incentives fades away as larger incentives are offered. That is, in a problem of multidimensional signaling problem, observers cease to discount for the extrinsic part of motives for sufficiently large values of incentives, thus showing how information asymmetry can work for the most opportunistic types.

This dissertation finally contributes to the literature on Political influence and Corruption. While Chapter 2 considers the extreme case of Business Politicians in which firms set their own rules of the game, Chapter 3 considers a weaker form of political influence whereby firms try to affect public policy outcome through bribery. Theoretically, it provides a strategic explanation of corruption, shows who the corruptor would try to offer bribery to and derives corruption-proof incentives.

To sum up and put conclusions together to answer this dissertation research question, there is potentiality for CSR activities of firms to correct government failures in the public good provision, but also to be the source of it (through the political influence channel). Regulators can rely on firms to provide certain public goods and further promoting such practices by granting tax exemptions, this is especially the case when the corporate provision can substitute for the government provision. However, when the former can only complement the latter, there is room for government intervention to correct *CSR failures* through taxation. In a context of political influence, the government provision of the public good can be reduced to enhance the signaling value of CSR. Finally, political influence in the form of

bribery tends to be easier in economies where the efforts of the different agencies are too interdependent because then the tendency to accept bribery is strategically enhanced.

## Implications for Public Policy

The findings of this dissertation have some interesting policy implications pertaining to the tax exemptions granted to CSR activities, political influence and the public good and hedging against corruption in government agencies. First, the tax policy regarding CSR activities of firms should be reviewed in light of the public policy objectives. If a particular public good is underprovided in the economy and inequality of income prevails, taxing CSR goods that complement this good<sup>21</sup> could be an efficient public policy tool.

Since political influence that firms have over public policy leads to an under provision of public goods, reducing this influence seems like a core issue for regulators. On the one hand, the Business Politicians phenomenon should be limited. Legal restrictions should be imposed on business activities by public officials and politicians. This is actually the case in some economies; e.g. in the U.S., Congressmen are not allowed to conduct a private business during their tenure. Assuming businessmen run for office to avoid the cost of lobbying public officials, an alternative means to limit the phenomenon would be to enhance the institutions that hold elected officials accountable to voters – such as media freedom and government transparency – which then raise the cost of renegeing on campaign promises.

On the other hand, political influence through bribery given to public officials should be contained. The production process of the public projects or goods shouldn't be made highly dependent on the coordination between the different government agencies, such as in highly bureaucratic systems, especially in an economy with lenient rules and weak supervision. Having agencies that are only loosely connected to others (such as the Central Bank, the Environmental Protection Agency in the U.S. or other regulatory agencies in Europe) makes them less prone to the domino effect of corruption that results from the general atmosphere of mistrust.

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<sup>21</sup>and sometimes when they are substitutes

Hence, unless the public agencies have a very low tendency for corruption, (e.g. they have been appointed in this particular position for their reputation) , too much complementarity between the different agencies increases the potential for corruption, facilitates political influence and eventually reduces the public good provision.

## Limits and Further Research Paths

Now we take a step back to summarize what could not be tackled in this research and what was left open to explore for academics to understand interactions between CSR, political influence and the public good.

A first limit of this dissertation is that the choice of the public good provided by the firm through its CSR activities has not been analyzed. Precisely, do firms choose to provide the public good for the provision of which they can draw on their technical expertise or is it more of a marketing tool and thus its choice is rather influenced by the taste of their particular clientele? In each case, the corporate provision of public goods would clearly have different societal implications. A similar research could be conducted for multinational firms. Do they tend to target the needs of the communities in which they operate or their choice would rather be influenced by the CSR culture of their country of origin? The same mechanism we used to analyze the signal extraction problem in the controversial context of business politicians could be used to analyze the controversial question of CSR activities of sin industries (e.g. tobacco, gambling..). Finally, the role of media in reducing the impact of CSR on the public good provision, through the public influence channel, has not been discussed in this dissertation. And, if media is assumed to be under the control of business politicians as well, what role could social media have in such context? A lot of mechanisms and controversies are yet to be unveiled in the CSR domain, extensive research in this area seems like a promising avenue.

# Chapter 1

## Corporate Social Responsibility and Regulation: Taxing Ethical Behaviour

### Abstract

This paper analyzes the impact of Corporate Social Responsibility in a monopoly setup and the implications of government intervention through a consumption tax or subsidy. Assuming that consumers have heterogeneous preferences regarding the CSR content of the private good they purchase and that their degree of altruism is positively related to their income, the paper assesses whether taxing CSR products could be welfare improving, when the tax revenues are recycled in the form of government provision of a public good that either substitutes for or complements the firm's CSR investments. We show that, when private and public investments are perfect substitutes, CSR activities should benefit from tax exemptions. However, when they are complements, the CSR products should be taxed when there is a sufficiently large marginal willingness to pay for such activities. Taxing the CSR product can then be viewed as a form of progressive taxation whereby more taxes are levied on wealthier consumers to make the public good available to everyone. Finally, we assess whether taxes on CSR goods disfavour the efficient producers or rather the inefficient ones, given different objectives of the regulator.

*JEL classification:* M14, H41, D6, H11, L21

*Keywords:* Corporate Social Responsibility, Public Goods, Regulation, Progressive Tax.

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## 1.1 Introduction

The traditional view of how society should be organized has rested on two pillars. The invisible hand of the market harnesses consumers' and corporations' pursuit of self-interest to the pursuit of efficiency. The state corrects market failures whenever externalities stand in the way of efficiency and redistributes income and wealth, as the income and wealth distribution generated by markets has no reason to fit society's moral standards. From this perspective, it was only natural to think that the State is the sole provider of public goods as their provision is subject to free-riding problems and hence cannot be left in the hands of individuals. But recently, government failures have arisen and society's demands for individual and corporate social responsibility as an alternative response to market and redistributive failures have become more prominent. Government failures can find its origins in the capture by lobbies and other interest groups. Governments under influence may fail to optimally correct externalities, or bend to wealthy agents' opposition to redistributive policies. Governments may also fall due to inefficiency, high transaction costs or poor information. So citizens and corporations empower themselves and substitute for elected government. The movement is gaining momentum and the Private Provision of Public Goods is being revisited.

Many public goods are privately provided either through direct contributions by individuals or by firms as part of their marketing or business strategy (what we call "Corporate Social Responsibility" practices). Provision of public goods using direct contributions has been studied extensively. In contrast, there has been relatively little work on private provision by firms. The economics literature on private provision of public goods has focused on the direct contributions mechanism. The general assumption of theoretical research in this area is that individuals choose between consumption of a private good and contributions to a pure public good. Yet individuals increasingly face a third option: consumption of impure public goods that generate private and public goods as a joint product. Markets for "socially responsible" goods and services exemplify the increased availability of impure public goods in the economy. The distinguishing feature of these markets is availability of impure public goods (or "responsible" goods) that arise through joint production of a private good and an environmental or social public good.

For example, consider the growing market for fair trade coffee, which is coffee produced under high social and environmental standards. The producers of fair trade coffee are paid a higher price than standard coffee in order to promote healthier working conditions for farmers and farm workers and fair wages. Fair trade premiums are then invested

in community development projects like scholarship programs, healthcare services and quality improvement training. Consumers increasingly have the option to purchase fair trade coffee with a price premium. In return, production of fair trade coffee raises the living standards of farmers and farm workers and helps develop the community. Thus consumers of fair trade purchase a joint product—coffee consumption and community development. Another example is the growing market for premium-priced products which are linked to a social cause. This is the case of cause-related marketing (explicitly linking the sale of a company’s product to company contributions to worthy causes) and lump-sum corporate donations to or expenditures on worthy causes or green activities, which implicitly link the contribution to sales of the company’s products. Thus consumers of such products also purchase a joint product —consumption of the private good and investment in the social cause embraced by the firm. In all these examples, the joint product forms an impure public good — with private and public characteristics. Firms producing the impure public goods will be referred to as *socially responsibly* firms.

This paper has been motivated by the ongoing discussion among economists about the market and welfare implications of Corporate Social Responsibility (CSR hereafter) or “A concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholders on voluntary basis” (European Commission, 2001). This discussion was initiated by the rapid growth of firms whose products are strongly connected to social and ecological considerations. CSR activities being viewed as the corporate provision of a public good, it is a common practice in many economies that they enable tax exemptions. For instance, The Chilean government offers a variety of tax credits to corporations for charitable donations, most of which are oriented to support educational activities, such as schools, universities, and vocational institutions. Italy has introduced an ecolabelling scheme that provides the purchaser with a sales tax reduction on the purchase price of green products (Bell, 2002). In the U.S, tax exemptions are designed so as to promote the adoption of hybrid-electric vehicles (Diamond, 2009). The World Bank identifies those tax incentives as an effective means by which governments can fulfill their role in promoting CSR (Fox et al., 2002).

The present paper assesses whether these exemptions are necessarily optimal, given the nature of interdependence between the public good provided by the company and that provided through the government. For instance, should the same tax exemptions apply to a firm constructing a school for children in a poor neighbourhood and one that incorporates a number of billable hours for its employees to volunteer in public schools? Should the

tax policy distinguish between a company donating to build a hospital for cancer patients and one that donates to paint the walls or provide complementary equipment for a public hospital?

The understanding of CSR has matured among both scholars and practitioners. It is about time the focus of the analysis and debates shifts from the *desirability* and *feasibility* of CSR to the *regulation* of CSR, to get the most out of it. Firms' intervention on the market to correct government failures is sometimes necessary, but so is the government's intervention to correct CSR failures and capitalize on its benefits. In doing so, the regulator ought to draw a clear distinction between the different practices, according to whether they complement or substitute for the government provision of the public good. A priori, companies investing in clean energy resources, reducing carbon footprint or providing access to clean water in deprived areas and those enhancing work conditions for their employees or providing some paid staff time to charitable causes should receive a differential treatment, given the public policy objectives of course.

The objective of this study is then three-fold: (i) to understand the behaviour of both *responsible* consumers and producers, and what makes products associated with CSR *niche* products, (ii) to compare and analyze the effectiveness of tax (or subsidy) policies in promoting responsible products, and (iii) to provide guidelines for policy makers to determine the optimal way to intervene on a market with CSR activities, given the nature of interdependence between CSR and the public good provided through the government.

We consider a monopoly market for a final good where the firm engages in CSR activities in order to create a socially friendly image for its product. Building on the characteristics approach to consumers' behaviour, we assume that individuals derive utility from characteristics of goods rather than goods themselves. Individuals have the opportunity to consume a private good and make a contribution to a pure public good, with each activity generating its own characteristic, such that the same private and public characteristics are available jointly through consumption of an impure public good. Furthermore, we consider that consumers are homogeneous regarding the physical characteristics of the private good, but heterogeneous towards the valuation of the CSR aspects of the product. More socially conscious consumers have higher willingness to pay for the socially friendly good.

Consumers' *image concerns* behind such prosocial behaviour is also considered: the fewer the consumers that are purchasing the good, the higher the *prestige* from being one. Some socially responsible consumers then have a positive valuation for the product of the

firm that engages in CSR activities and are willing to pay a higher price for the *socially friendly* good as they derive a warm-glow utility from contributing to the public good. This is the rationale why consumers show strong preference for fair trade coffee, even though this product is more expensive than other conventional coffee. Hence CSR is viewed here as a profit-maximizing strategy undertaken by the firm when customers are willing to sacrifice money (yield purchasing power) so as to further social goals. Put differently, we consider that CSR is a profitable practice when consumers have some demand for corporations to engage in philanthropy on their behalf.

Under this assumption, we set up our benchmark model, the *unregulated* scenario, assuming that the economy consists only of a monopolist and a unit mass of consumers interacting in the market without any policy intervention. We identify conditions under which the monopolist engages in CSR as well as the conditions under which CSR is welfare-improving compared to the benchmark case without CSR activities. Then, we extend the model to allow for a welfare-maximizing regulator to intervene by imposing a consumption tax and then providing a certain amount of the public good using the collected taxes. We contrast the optimal tax rate that would be set when the public and private investments are substitutes and when they are complements.

Our main finding is that the regulator would always subsidize the monopolist if CSR investments and government provision are substitutes, whereas he would impose a positive tax, under certain conditions, when they are complements. Further, while efficient producers should be offered higher subsidies in the substitution case, they should be imposed larger taxes in the complementarity scenario. Comparing different objectives of the regulator, we find that the tax rate is the lowest under a benevolent regulator and the largest under a Leviathan-type government that aims at maximizing the tax revenues, with the tax rate set by a public-good maximizing regulator lying in between. Under all objectives of the regulator, efficient producers are disfavoured, in the sense that they are imposed larger taxes, when their CSR investments complement the public good provided by the government. However, when their investment substitutes for that of the government's, they are not necessarily worse off.

## Literature Review

Our research draws on the confluence of three diverse streams of literature: private provision of public goods, strategic CSR and market outcomes and finally CSR and regulation.

**Private Provision of Public Goods** The paper is related to the large literature on the private provision of public goods going back to the classic contributions by Bergstrom, Blume and Varian (1986). This examines when private action can lead to public goods provision even though there is an underlying free-rider problem. The standard pure public good model has only a private good and a pure public good. In the standard impure public good model, the characteristics of the impure public good are not available through any other means (Cornes and Sandler 1984, 1994). This setup has been extended in other models to enable provision of the public characteristic through direct donations (Vicary 1997, 2000), but the private characteristic of the impure public good remains otherwise unavailable. In contrast, Kotchen (2006) develops a model that applies when both characteristics of the impure public good are also available separately, so individuals typically have three relevant choices: a conventional pure private good, a direct donation to a pure public good, and a green or impure public version of the good that jointly provides characteristics of the other two choices.

In this paper, we use the standard impure public good model where the private good is linked to the provision of a pure public good and no direct donations are allowed. So, in a way, we view CSR here as a delegated philanthropy by the part of consumers. A question that seems to be in order here is: why people would want corporations to do good on their behalf, rather than doing it on their own or through charitable organizations, churches.. etc? Information and transaction costs are clearly important here. In theory, consumers could send money to directly supplement the income of workers in the coffee plantations supplying Starbucks. But they would have to be informed about the occurrence of individual trades and contracts and their financial transfers would involve enormous transaction costs. Somehow, philanthropy must thus be delegated. It could perhaps be entrusted to some charitable organization, but transaction costs are still likely to be much lower if delegation goes through the corporation, which already is involved in a financial relationship with the workers.

Another argument for asking corporations to behave pro-socially is that the desired actions are often not about transferring income to less-favored populations, but about refraining from specific behaviours, such as polluting the environment; here there is no substitute for asking the firm to behave well when the state does not impose constraining regulations. A related case is when a firm draws on its technical expertise or exploits complementarities to deliver goods and services to those in need more efficiently than the governments or other philanthropic intermediaries could. Examples include a giant

supermarket chain organizing relief convoys to a zone hit by a hurricane, or a large water-treatment utility setting up a program of digging water wells for poor, remote villages in a developing country.

**Strategic CSR** Our paper also contributes to the literature on strategic CSR, in the terminology of Baron (2001) and in the spirit of a “doing well by doing good” strategy (Bénabou and Tirole, 2010). Strategic CSR refers to the case where firms are assumed to be socially responsible because they anticipate a benefit from such a behaviour. In this sense, our work is related to the strand of theoretical literature that addresses conditions under which firms engage in CSR and its economics implications ( see Crifo and Forget, 2014; Kitzmueller and Shimshak, 2012). In particular, our contribution is more closely related to theoretical research where CSR is a business strategy in imperfect competition that generates product differentiation or ameliorates information asymmetries between consumers and producers.

Baron (2001, 2003) examines CSR under the prism of the strategic choice between *public and private politics*. His main finding is that private politics and CSR affect the strategic position of a firm in an industry under the existence of activist consumers, who can boycott firms with non-socially friendly behaviour. In the same vein, Calveras et al. (2006), assuming a perfectly competitive supply of inputs, compare the effects of formal regulation to firms’ incentives to provide socially friendly goods as a response to increased *activism* on behalf of consumers. McWilliams and Siegel (2001) model firms’ incentives to engage in CSR activities in oligopolistic markets with homogeneous goods as a means of product differentiation.

In the same vein, a few papers study the *impact of strategic CSR on market outcomes* and social welfare in an oligopoly setting. Bagnoli and Watts (2003) examine the case in which an oligopolistic firm links the provision of a public good (such as CSR activities) to the sale of their private product, in the context of unit demands and homogeneous socially responsible consumers. They find that the provision of CSR by firms is negatively related to the number of the firms in the market and positively related to the consumers’ willingness to pay for the supply of the public good. Another example of strategic CSR is the *cause-related marketing* analyzed by Polischuck and Firsov (2005), which is a business strategy whereby firms bundle their products and brands with contributions to designated charities. They find that such strategy can be used as a price-discrimination tool. Furthermore, it channels to charity significant resources that would not be available otherwise due to high transaction costs of individual donations and thus contributes to social welfare.

Besley and Ghatak (2007) model firms as competing for socially responsible consumers by linking the provision of a public good - environmentally friendly or socially responsible activities - to sales of their private goods. They find that, in many cases, too little of the public good is provided, but under certain conditions, competition leads to excessive provision. Further, they conclude that there is generally a trade-off between more efficient provision of the private and the public good. They study strategic CSR under both Cournot and Bertrand competition and conclude that the level of private provision of the public good varies inversely with the competitiveness of the private-good market. We assume a monopolistic market so as to capture the firm's incentives to engage in CSR disregarding the strategic effect arising from market competition and study conditions under which CSR is welfare-improving.

**CSR and Regulation** The Literature on CSR and regulation has evolved along two parallel lines: eco-labeling and green tax policies. *Eco-labeling* analyzes the value of certified or noncertified claims that the product meets the objectives of green consumers. The literature on eco-labeling makes the assumption that the "social responsibility" attribute of a product is a credence good in the sense that consumers cannot actually monitor the firm's CSR activities. Hence, in the absence of a credible information disclosure mechanism about social responsibility attributes of the firm's products to consumers, firms will fail to persuade consumers about their true commitment to social values, thus, a "market for lemons" problem arises. Mitrokostas and Petrakis (2007) analyze the case where the regulator intervenes to solve this problem by proposing a certain standard of CSR effort to the firms and providing certification to the firms that comply with the standard. They find that government intervention actually increases total welfare since it gives both firms incentives to engage in CSR activities. In Manasakis et al. (2013), the analysis is extended to allow for different objectives of the regulator. The authors investigate the impact of alternative certifying institutions on firms' incentives to engage in costly CSR activities as well as their relative market and societal implications. They find that the CSR certification standard is the lowest under for-profit private certifiers and the highest under a Non Governmental Organization (NGO), with the standard of a welfare-maximizing public certifier lying in between. In this paper however we assume that the firm can credibly inform consumers about their CSR effort by using labels on their products or by publishing reports about their CSR activities, but compare different objectives of the regulator when setting a consumption tax on CSR products.

Much research has focused on the effectiveness of regulatory policies that consist in

*imposing emission taxes* on some products and giving *subsidies to green products* to encourage environmentally responsible production. The public good in this context is the reduction of pollution. An interesting idea that emerges from the analysis of environmental taxes is that of the *double dividend* (Pearce, 1991; Goulder, 1995; Bovenberg and De Mooij, 1994): a green tax reform or a tax swap whereby an ecotax (a positive tax on carbon dioxide emissions) is levied and the proceeds are devoted to decrease some other distortionary tax while keeping government income constant, may achieve a so-called double dividend, that is, an increase in (i) environmental quality – the so-called green dividend – and (ii) an increase in welfare from private commodities – the so called blue dividend. The double dividend hypothesis has been tested taking into account the different impacts an environmental tax may have, precisely and most relevant to our analysis, the case where the *proceeds of taxation are used to finance a public good*, that is a public pollution abatement activity (John et al., 1995) and taking into account the heterogeneity in households income, which translates into the *degree of regressivity in the environmental tax* (Chiroleu-Assouline and Fodha, 2014).

Although we do not use a general equilibrium model where the tax proceeds are recycled to reduce some other distortionary tax, our analysis suggests the possibility of a double-dividend occurring from taxing products *with* a CSR content. The green dividend is then the higher public good that could be achieved through both the CSR investments and the public investment that the tax allows, and, by remote analogy to the double-dividend theory, the additional redistributive benefit that taxing the CSR product enables can be interpreted as the blue dividend. In some cases, taxing CSR products can serve as a means of redistribution: it narrows the pool of green consumers purchasing the good. If we assume altruistic motives to be correlated with income, the tax payers will then be the consumers at the higher end of the distribution of income who pay larger taxes to make the public good available for all. We extend the analysis to study the effect of different objectives of the regulator on the choice of the tax rate.

The paper is organized as follows. Section 2 introduces the basic model. The implications of a consumption tax imposed on the impure public good as well as the welfare maximizing tax are examined in Section 3. Section 4 presents the discussion of the model, which is extended to include alternative objectives of governments. Finally, Section 6 concludes.

## 1.2 Benchmark Model: the Unregulated Monopoly

In this section, we set up the benchmark model where the consumers care about the public good and the monopolist engages in CSR activities, we describe the mechanisms underlying the optimal choice of the producer and we conduct a simple comparative statics exercise to show how the equilibrium is affected by changes in the different parameters of the model.

### 1.2.1 Demand of the Heterogenous Consumers

We consider a market for a private good that consists of a a continuum of consumers and a monopolist that engages in CSR activities. CSR here is modelled as the private provision of a public good - environmentally friendly or socially responsible activities - such that the amount of public good provided is linked to consumer purchases of the private good.

**Consumers' preferences** On the demand side, there is a unit mass of consumers, each having a unit demand  $q \in \{0, 1\}$ . They have identical preferences regarding the physical characteristics of the good. They are, however, heterogeneous regarding their valuation of the CSR activities that are undertaken by the firm that produces the good and  $\theta \in [0, 1]$  is introduced to account for this heterogeneity: the more socially conscious a consumer is, the higher is his  $\theta$ . We further assume that the realization of  $\theta$  is private information of each consumer, it follows a cumulative distribution  $F(\theta)$  and density  $f(\theta)$  that are common knowledge. The utility function of a  $\theta$ -type consumer is given by:

$$U(\theta, q) = \begin{cases} \beta s - \frac{1}{2}(1 - \theta)s^2 + r(s, p) + \alpha - p + Y & \text{if } q = 1 \\ Y & \text{if } q = 0 \end{cases} \quad (1.1)$$

where  $s \geq 0$  is the CSR effort that the monopolist undertakes for each unit of the private good sold; so, for the consumer, it represents the monetary contribution to social causes or to the public good provision from buying the good. Consumers derive a baseline *warm glow* utility<sup>1</sup> of  $\beta s$  with utility functions that are concave in  $s$ , with the rate of decrease being dependent on consumer's social consciousness: the higher  $\theta$ , the lower the decrease in warm-glow due to a larger  $s$ . For a given level of CSR  $s$ , a consumer's utility from contributing to the public good ranges from  $\beta s - \frac{1}{2}s^2$ , if he does not value the firm's CSR activities at all, to  $\beta s$ , if he is of the most caring type.

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<sup>1</sup>A term that is extensively used in the litterature on the private provision of public goods and that refers to the *joy of giving*.

Beside the altruistic motives from purchasing the good, consumers derive a positive utility from being seen as responsible consumers that we refer to as the *prestige or distinction utility*,  $r$ . This can be interpreted as consumers caring about the opinion others have of them or simply their self-image. Following Bénabou and Tirole (2010), we assume that this reputational gain from belonging to the group of responsible consumers emerges endogenously as it will be determined by the characteristics of this particular group at equilibrium. Furthermore, in the terms of Besley and Ghatak (2007), all consumers are assumed to be *caring*, in the sense that they all care about the overall level of public good available in the economy  $Y$ . This particular utility however is independent of their purchase decisions since the weight attributed to each is too small to affect the outcome. Finally, the parameter  $\alpha$  represents the marginal utility from the private good consumption<sup>2</sup> and  $p$  the unit price set by the monopolist for the private-public good bundle he offers.

For the sake of simplicity, we assume that  $\theta$  is uniformly distributed. A  $\theta$ -type consumer decides to buy the good if

$$\theta \geq \frac{p - \alpha - \beta s + \frac{s^2}{2} - r}{\frac{s^2}{2}} \equiv \theta^*(s, p)$$

Hence, there exists a threshold type  $\theta^*$  above which consumers decide to purchase the good and below which they abstain. The prestige utility can now be formally defined: it is the expected value of the social consciousness of the group of responsible consumers compared to that of the most caring type:

$$r(s, p) = E(\theta|q = 1) - \theta^{max} = E(\theta|\theta \geq \theta^*) - 1$$

with  $E(\theta|\theta \geq \theta^*) = \frac{\int_{\theta^*(s,p)}^1 \theta f(\theta) d\theta}{1 - F(\theta^*)}$  being the conditional mean in the upper tail of the distribution of  $\theta$ . This utility takes into account both the value of  $\theta^*$  and the weight attributed to  $\theta \geq \theta^*$ , i.e. to which degree is the product in question is a niche product. In the uniform case, the prestige utility is then given by  $r(s, p) = \frac{(\theta^*(s,p)+1)}{2} - 1$ , which amounts to:

$$r(s, p) = \frac{1}{2}[1 - \theta^*(s, p)]$$

The prestige gain from being a *responsible consumer* thus increases as the pool of these consumers narrows, i.e. the more it becomes a *niche* good that only the highest types

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<sup>2</sup>The parameters  $\alpha$  and  $\beta$  are assumed to be strictly positive.

purchase. Plugging this term into the consumer's incentive constraint, the threshold type  $\theta^*$  can now be written as:

$$\theta^*(s, p) = \frac{2(p - \alpha - \beta s) + s^2 + 1}{s^2 + 1} \quad (1.2)$$

The individual demand of a  $\theta$ -type consumer now reduces to:

$$q(\theta, s, p) = \begin{cases} 1 & \text{if } \theta \geq \theta^*(s, p) \\ 0 & \text{otherwise} \end{cases} \quad (1.3)$$

which can be integrated over the interval  $[0, 1]$  to obtain the aggregate demand:

$$Q(s, p) = \int_0^1 q(\theta) f(\theta) d\theta = \int_{\theta^*(s, p)}^1 f(\theta) d\theta = 1 - \theta^*(s, p) = \frac{2(\beta s - p + \alpha)}{s^2 + 1} \quad (1.4)$$

which always decreases in the price set by the monopolist but may increase or decrease with the per unit contributions to social causes, depending on the CSR-price bundle offered on the market.

## 1.2.2 Choice of the CSR-price bundle

We assume the monopolist has a constant returns to scale production technology for the private good, he has a constant marginal cost of production given by  $0 \leq c < \alpha$ . Contribution to the public good amounts to an increase the marginal cost by  $s$ . The monopolist decides simultaneously on the per unit monetary contributions donated to social causes,  $s$ , and the price to be charged,  $p$ , so as to maximize his payoffs given by

$$\pi(s, p) = (p - s - c)Q(s, p)$$

**Proposition 1.** *The monopolist has incentives to engage in CSR only if  $\beta > 1$  and  $\alpha > c$ , the CSR-price bundle he offers on the market is then*

$$\left[ s = \frac{\beta - 1}{\alpha - c}, p = \frac{\beta + 1}{2}s + \frac{\alpha + c}{2} \right]$$

*Otherwise, the monopolist is better off offering  $(s = 0, p_m^0 = \frac{\alpha + c}{2})$ . (proof in the appendix)*

By engaging in corporate social responsibility, the monopolist makes his product more valuable to consumers. However, he also incurs a cost by doing CSR, the total monetary contributions donated to social causes. A necessary condition for the producer to engage

in CSR is that consumers' average marginal willingness to pay for a firm's social behaviour,  $\beta$ , must be higher than the marginal cost of increasing CSR to the firm, which is 1 dollar. Thus, only when consumers place a sufficiently high value on CSR will the firm practice it. Since offering a positive contribution to the public good alongside the private one requires raising the price, the firm cannot engage in CSR unless the willingness to pay for the private good itself covers marginal cost of production  $c$ , otherwise no one would be willing to buy the good.

**Choice of the CSR content** The above proposition shows that the optimal choice of social contributions is equal to the marginal profitability of CSR activities relative to that of the private good. Hence, any factor that decreases the profit from selling the private good induces the monopolist to invest more in CSR, and this is what we call the *make-up effect*, as if the producer had two businesses: selling the private good and investing in the public good, and he is trying to make up the lower profitability of the first by a higher investment in the second. For instance, CSR effort increases the lower the willingness to pay for the private good  $\alpha$  and the larger the marginal cost of its production  $c$ . That is, a producer may choose a high CSR content of the good just because he is inefficient in the production (as captured by a high  $c$ ) or the private good he sells is not strongly demanded on the market. The intuition behind this result is that the higher the cost of production, the more it pays for the firm to use CSR to expand the demand of its product and/or be able to charge a higher price for the CSR-private good bundle. This result relies on the assumption that both the public and private components of the good are substitutes in consumption.

**Pricing Strategy** To see the full picture, we need to take a closer look at the pricing strategy of the impure public good in this setup. From the first-order condition of the monopolist's maximization problem with respect to the price, it can be seen that the optimal price depends on the CSR content of the product such that:

$$p^*(s) = p_s s + p_m^0 = \frac{\beta + 1}{2} s + \frac{\alpha + c}{2} \quad (1.5)$$

where  $p_s s$  denotes the weight of CSR in the price the monopolist charges, so  $p_s$  can be seen as the unit price of the contributions to social causes and  $p_m^0$  is the part of the price imputed to the private good, that is the monopoly price absent any CSR efforts. The optimal price thus consists of the per unit investment in the public good weighted by the

premium he is able to charge for his CSR activities, and the average of the marginal utility and cost of the private good provision. Since  $\beta$  must be greater than 1 for the monopolist to engage in CSR, it is always the case that the premium on CSR exceeds 1.

**Lemma 2.** *In a monopoly setup, each dollar contributed to social causes via the purchase of the impure public good costs the consumer more than one dollar.*

Hence, unless the monopolist has a comparative advantage in providing this particular public good, this is perhaps not the most efficient means for the private provision of public goods.

### 1.2.3 Equilibrium Analysis

This part of the analysis addresses two main questions: *How do the values of the different parameters affect the choice of the CSR-price bundle? And is CSR always welfare-improving?*

**Comparative Statics** A simple comparative statics exercise allows us to discuss the impact of the different parameters on the optimal choice of the CSR-price bundle. For this part, we refer to the optimal value of CSR content given in proposition 1 and the pricing strategy given by equation (5). While a higher marginal cost  $c$  always increases the price, by increasing both the per unit contributions via the make-up effect and the price of the private component of the good<sup>3</sup>, a higher willingness to pay for the private good  $\alpha$  has an ambiguous effect on the price: on the one hand, it makes the monopolist more free-handed in charging a higher price for the private component, but on the other, reduces his incentives for offering CSR alongside his good, that is per unit contributions fall. Counterintuitively, if the latter effect is stronger, it may actually be optimal for the monopolist to charge a lower price even though the willingness to pay for his product has increased<sup>4</sup>.

In line with previous works on CSR, we find that CSR always increases with the average interest towards CSR as represented by the willingness to pay for the public good,  $\beta$ . Perhaps one possible explanation for this is that the increase in consumers' demand for firms to behave responsibly leads to more pressure exerted on firms by consumers, activists and NGOs and this, in turn, induces the firm to embrace CSR activities, and

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<sup>3</sup>Given a general form distribution  $F(\theta)$ , a more efficient monopolist may then yield a higher or a lower surplus to consumers.

<sup>4</sup>This is the case where the private good is sufficiently more profitable than CSR, precisely, when  $(\alpha - c)^2 > \beta^2 - 1$ .

this is the *private politics* argument for CSR (Baron, 2003). But we also find that the premium for CSR increases with this interest in CSR. As  $\beta$  increases, not only does the level of CSR undertaken by the firm increase, but also the weight of CSR in the price set by the monopolist increases. So the more consumers in the economy care about the public good, the higher the price they will be charged, not only because the per unit contributions to the public good increase but also because the producer now puts more weight on those increased contributions when determining his optimal price. Thus the impact of such increase on consumer surplus is a priori ambiguous. The following discussion gives conditions under which a higher demand for firms to behave responsibly is welfare improving for the consumers.

**Market Outcomes** Plugging the optimal price and CSR content into the demand and profits functions yields the equilibrium values  $Q(s^*, p^*) = \alpha - c$  and  $\pi(s^*, p^*) = \frac{(\alpha+c)^2}{2} + \frac{(\beta-1)^2}{2}$ . Consumers with  $\theta \geq 1 - (\alpha - c)$  purchase the good and those below this threshold abstain. Now we would like to assess the welfare impact of CSR. For this, we compare between the results obtained and the case where the monopolist does not engage in CSR ( $s = 0$ ). In the latter, the market outcomes coincide to the standard monopoly, where the producer maximizes profits  $\pi = (p - c)Q(p)$ . The equilibrium output, price and profits are, respectively,  $p_m^0 = \frac{\alpha+c}{2}$ ,  $Q^0 = \alpha - c$  and  $\pi^0 = \frac{(\alpha-c)^2}{2}$ .

**Lemma 3.** • *In the equilibrium of the benchmark case with CSR: (i)  $Q(s^*, p^*) = Q^0$ , (ii)  $p^*(s^*) > p^0$ , (iii)  $\pi(s^*, p^*) > \pi^0$ , and (iv)  $CS(s^*, p^*) \leq CS^0$ .*

• *CSR is welfare improving iff  $\beta > \frac{\sqrt{2}\sqrt{3(\alpha-c)+2+1}}{3}$  (proof in the appendix)*

This result shows that aggregate output will be the same whether the monopolist exerts CSR efforts or not, whereas the prices and profits will be higher in the case where he does CSR. In our model, consumers perceive that the product of the firm that engages in CSR is of a high "quality". The monopolist knows about this and uses CSR to expand consumer demand. But on the other hand, CSR means that he will have higher monetary costs. Thus only when consumers have sufficiently strong preferences for CSR -  $\beta > 1$  - will the monopolist have an incentive to engage in CSR so that he can be compensated for the increased cost he incurs. These higher prices weigh negatively on the demand and thus the total demand remains unchanged at equilibrium. The above lemma also shows that the firm's profits increase with CSR since the aggregate output remains the same and the higher equilibrium prices more than compensate the cost of CSR (recall that  $p_s > 1$ ). So the profits in the case of CSR are simply two additive terms  $\pi^0 + \frac{(\beta-1)^2}{2}$ .

Finally, introducing CSR on the market is welfare-improving for the consumers only if the average interest in CSR is sufficiently large relative to the marginal utility from the private good. Two explanations are behind this finding. First, in our setup, introducing a positive amount of CSR alongside each unit produced increases the price and excludes consumers with lower interest in CSR (i.e. lower  $\theta$ ). Thus the loss in both warm glow and prestige utility of the excluded group is only offset by the gain of the buyers if the latter put a large value on such activities. Second, we assume the government does not intervene on the market up to this point and hence the public good is solely provided through CSR activities of the firm such that  $Y = sQ = \beta - 1$ . Total amount of public good available thus increases in the average social interest in CSR,  $\beta$ . CSR is then welfare-improving for the consumers if  $\frac{(\beta-1)^2}{4} + (\beta - 1) > \frac{\alpha-c}{2}$  (proof in the appendix). Otherwise, consumers are better off consuming the private good with no CSR content. In sum, CSR is welfare improving if consumers have *sufficiently* strong preferences for such activities, that is  $\beta > \frac{\sqrt{2}\sqrt{3(\alpha-c)+2}+1}{3}$  because only then will the gains of both the monopolist and the consumers outweigh the loss of warm glow and prestige utility of the excluded buyers.

### 1.3 Regulated Scenario

To assess the impact of taxing CSR products, a game where the government first sets the tax rate then the monopolist decides on his CSR-price bundle is considered. The impact of the tax on the level of CSR efforts as well as the pool of consumers paying this tax are analyzed.

#### 1.3.1 Choice of the CSR-price bundle: Second-stage outcome

We introduce into the model a regulator that imposes an ad valorem tax, denoted by  $t$ , and uses the collected taxes to provide a certain amount of the public good, which can complement or substitute for the public good provided by the monopolist as we shall see. The timing of the game goes as follows. In the first stage, the government sets the tax rate  $t$  that maximizes its objective function. In the second stage, given the tax rate, the producer decides whether or not he will engage in CSR activities and chooses  $s$  and  $p$  simultaneously as to maximize his profits. Finally, each consumer, given his  $\theta$ , forms his demand taking into account the tax rate set by the government and the price and per unit contributions set by the producer. The game will be solved backwards. The point of

departure is thus the subgame played by firms and consumers in the final stage after the government has decided on the tax rate to be imposed. The  $\theta$ -type consumer chooses the quantity  $q(\theta)$  that maximizes his utility given by

$$U(\theta) = \begin{cases} \beta s - \frac{1}{2}(1 - \theta)s^2 + r(s, p) + \alpha - (t + 1)p + Y & \text{if } q = 1 \\ Y & \text{if } q = 0 \end{cases} \quad (1.6)$$

Using the same expression for the reputational gain, the individual demand of a  $\theta$ -type consumer will be given by

$$q(\theta, s, p) = \begin{cases} 1 & \text{if } \theta \geq \theta^*(s, p) \\ 0 & \text{otherwise} \end{cases}$$

where  $\theta^*(s, p) = \frac{2[(t+1)p - \alpha - \beta s] + s^2 + 1}{s^2 + 1}$ . By integration of the individual demands over the interval  $[0, 1]$ , we obtain the aggregate demand:

$$Q(s, p, t) = \frac{2[\beta s - (t + 1)p + \alpha]}{s^2 + 1} \quad (1.7)$$

The monopolist then maximizes his profits now given by

$$\pi(s, p, t) = (p - s - c) Q(s, p, t)$$

**Proposition 4.** *The optimal choice of the firm in the regulated scenario for the level of CSR per unit sold and for the overall price to be charged is:*

- if  $\beta > t + 1$  and  $\alpha > c(t + 1)$ ,

$$s^*(t) = \frac{\beta - (t + 1)}{\alpha - (t + 1)c} \quad (1.8)$$

and

$$p^*(t) = \frac{\beta^2 - (t + 1)^2 + \alpha^2 - (t + 1)^2 c^2}{2(t + 1)[\alpha - c(t + 1)]} \quad (1.9)$$

- Otherwise, the monopolist is better off offering  $s = 0$  and  $p = \frac{\alpha + c(t + 1)}{2(t + 1)}$ .

This proposition states that the firm will engage in CSR only if  $\beta > t + 1$  and  $\alpha > c(t + 1)$ <sup>5</sup>; that is CSR is feasible only if the average marginal willingness to pay for CSR

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<sup>5</sup>We refer the reader to the proof of proposition 1 given in the appendix to verify that  $s^*(t)$  and  $p^*(t)$  given in the above proposition yield a maximum under these conditions.

activities covers the *augmented* marginal cost of CSR and the marginal willingness to pay for the private good exceeds the taxed marginal cost of production. If the above conditions hold, the increase in firm's profits due to the higher price it can set for its CSR-private good bundle overcomes the increase in firm's costs due to CSR effort and taxes- compared to the regulated case without CSR activities, and therefore, the firm has an incentive to provide a positive level of CSR when complying to the tax rate set by the government. Otherwise, the firm will have no incentive to engage in CSR, it will pay the taxes imposed by the regulator and produce only the private good (if  $\alpha > c(t+1)$ ). Equilibrium aggregate demand, CSR investments and profits will then be

$$\begin{aligned}
 Q^*(t) &= \alpha - c(t+1) \\
 S^*(t) &= s(t)Q(t) = \beta - (t+1) \\
 \pi^*(t) &= \frac{[\beta - (t+1)]^2 + [\alpha - c(t+1)]^2}{2(t+1)} \tag{1.10}
 \end{aligned}$$

Before we plug the results obtained into stage 1 of the game where the government decides on the tax rate to impose, we analyze the mechanisms underlying both firm's and consumers' choices.

### 1.3.2 How do Consumers and the Monopolist react to an Ad Valorem Tax?

For this part of the analysis, we consider  $t$  to be exogenous and conduct a simple comparative statics exercise to assess its impact on the different choice variables of both the monopolist and the consumers. Two main questions are being discussed: *Can more taxes imply more CSR?* and *Who actually pays the tax?* Propositions 4.3 and 4.4 bring answers to these questions.

**Tax rate and CSR component of the good** One of the main findings of this paper is that a higher tax does not necessarily have a repressive effect on the CSR content of the product. The following proposition presents the conditions under which this result is valid.

**Proposition 5.** *Per unit contributions increase in the tax rate if  $\frac{\beta}{1} > \frac{\alpha}{c}$ , and decrease otherwise.*

This result is obtained by differentiating the optimal choice of CSR with respect to

the tax rate which yields

$$\frac{ds(t)}{dt} = \frac{\beta c - \alpha}{[\alpha - c(t + 1)]^2} \quad (1.11)$$

The consumption tax is imposed on the good the firm sells, and is perceived by the consumers as a price increase. So in a way, it increases the unit cost incurred by the firm since its price is now taxed. Furthermore, since the unit price consists of two parts, namely the marginal cost of the social contributions (1 dollar) and the marginal cost of the private good ( $c$ ), it is as if those two components have been taxed. *A priori* one would expect the increase in the tax rate to decrease the CSR effort of the producer who now incurs higher costs for both types of goods he sells. We find however that this is not necessarily the case.

It is possible that an increase in the tax rate set by the regulator increases the monopolist's incentives to raise the CSR component of his product, this is the case when the marginal utility to marginal cost ratio is higher for the CSR activities than for the private good; that is, if  $\frac{\beta}{1} > \frac{\alpha}{c}$ . As can be seen from (8), when the regulator increases the level of the consumption tax by  $\Delta t$ , he reduces the marginal profitabilities of both goods -CSR activities and the private good- but not necessarily proportionally. While the average marginal profitability of CSR ( $\beta - (t + 1)$ ) decreases by  $\Delta t$ , that of the private good ( $\alpha - c(t + 1)$ ) decreases by  $c\Delta t$ . So the tax will affect not only the absolute profitabilities, but also the relative ones, and hence it will affect the optimal level of CSR. Only if the CSR effort is *sufficiently* profitable will the increase in tax induce the producer to increase his level of CSR to compensate for his lower returns from selling the private good. This can be seen as the monopolist operating on two separate markets, and taxes make him redistribute his businesses according to the relative profitability of each. It should be noted however that total CSR efforts always decrease in the tax rate ( $\frac{dS(t)}{dt} = -1$ ).

**Effect of  $t$  on the price of the public-private bundle** Let us consider the price determination mechanism, which gives the following relation between the optimal price and CSR level undertaken by the firm, given the tax rate:

$$\begin{aligned} p^*(s, t) &= \frac{\beta + (t + 1)}{2(t + 1)} s(t) + \frac{\alpha + c(t + 1)}{2(t + 1)} \\ &= p_s(t) s(t) + p_m^0(t) \end{aligned} \quad (1.12)$$

with  $p_s(t)$  being the premium charged for CSR and  $p_m^0(t)$  the part of the price imputed to the private good that would have been charged by the monopolist in the absence of

CSR. Using this decomposition of the overall price, we analyze the effect of an increase in the tax rate on both the *quantity* and the *price* of the CSR component of the good, and consequently on the price of the private-public bundle on the market. Since CSR effort - as a component of the price- is taxed, an increase in the tax rate should restrict the monopolist's ability to charge a high price for the CSR component of his product,  $\frac{dp_s(t)}{dt}$  is always negative. Clearly, if a tax increase induces the monopolist to reduce his CSR activities, the part of the price imputed to CSR will decrease. And since the price of the private component also always decreases in the tax rate,  $\frac{dp_m^0(t)}{dt} < 0$ , increased taxes would lead to a lower price for the impure public good on the market. In the case where the tax increase leads to a higher CSR content of the product, the overall price may increase or decrease.

Finally observe the relation between  $\frac{dp(t)}{dt}$  and  $\frac{ds(t)}{dt}$ . A simple differentiation of eq.(12) shows that they can never be both null at the same time; meaning that, after a tax increase, the producer cannot keep both his level of per unit contributions *and* the price he charges unchanged. Note also that  $\frac{ds(t)}{dt}$  is always greater than  $\frac{dp(t)}{dt}$  if they are both positive, that is, the producer can never increase his price by more than he increases his CSR effort. However if they are both negative, then  $\frac{dp(t)}{dt}$  is necessarily greater than  $\frac{ds(t)}{dt}$  in absolute terms; meaning that if the producer reduces his CSR effort, he has to decrease the price by an even larger amount. This relation between  $\frac{dp(t)}{dt}$  and  $\frac{ds(t)}{dt}$  suggests the possibility that a tax increase may widen the pool of consumers purchasing the good. If it induces the producer to increase his per unit contributions - and the price weakly increases or even decreases - consumers with lower  $\theta$  would find the product more appealing as the warm glow utility from the purchase of the good increases. In the case where  $s'(t) < 0$ , the price reduction that accompanies the fall in the CSR content - and that is stronger in magnitude - makes the good more affordable for consumers with lower  $\theta$ . This point will be the focus of the following discussion.

**Who actually pays the tax?** Until now, we left unspecified the behaviour of the different *types* of consumers in the economy, having summarized it by the aggregate demand function. To see the whole picture, we need to be more specific on the impact of the tax on *who* buys the good and thus who actually contributes the most to the public good provision. This question is particularly important if we think of  $\theta$  as being correlated to income.

We find that, *regardless of the impact of the tax rate on the monopolist's choice of the CSR content and the price*, the pool of green consumers always narrows, at equilibrium,

as the tax increases. This result is due to the *prestige* component in the utility function of consumers  $\frac{1-\theta^*}{2}$ : even if after a tax increase consumers with lower  $\theta$  find the product more appealing (higher CSR content) or more affordable (lower price), they will be repelled from the lower prestige utility that results from everyone buying the good. Hence, by the means of the tax rate, the regulator can actually determine the pool of green consumers since, at equilibrium,

$$\theta^*(t) = 1 - [\alpha - c(t + 1)] \quad (1.13)$$

This also explains why the aggregate demand always decreases in the tax rate, as can be seen from (10), regardless of the monopolist's choices of  $s$  and  $p$ .

### 1.3.3 Choice of the Tax rate: A Benevolent Government

Now we turn to stage one of the taxation game where the regulator decides on the tax rate to be imposed given the behaviour of the different agents in the economy. This choice depends, on the one hand, on the production technology of the public good, and, on the other hand, on the political and social objectives of the regulator.

We begin by describing the government's objective in its simplest form, deferring discussions on the political and social objectives of the regulator until later. There is a single *welfare-maximizing* regulator, raising revenue only through taxes on products. The regulator adopts an ad valorem tax method, taxes will be imposed on the amount of sales. If the regulator sets a tax rate  $t$ , the tax revenue will be

$$G(t) = tp(t)Q(t) = \frac{t[\beta^2 - (t + 1)^2 + \alpha^2 - c^2(t + 1)^2]}{2(t + 1)} \quad (1.14)$$

We assume that tax revenues are meant for public good provision in order to benefit consumers. Unlike the unregulated scenario where the overall level of public good in the economy,  $Y$ , coincides with the total monopolist contributions to social causes, after the government intervention,  $Y(t) = Y(G(t), S(t))$  is a certain function of private provision - the total CSR efforts of the monopolist - and the public provision of the public good which coincides with the total tax revenues. Now a brief discussion on the functional form of  $Y(t)$  and consequently on its impact on the government's choice is necessary. We consider two scenarios : in the first, the private investment in the public good and the government provision of the public good are substitutes, and in the second, they are complements.

**Production Technology of the Public Good** A simple additive production function helps illustrate the case where the private and public investment in the public good are substitutes:

$$Y^{subs}(t) = G(t) + S(t)$$

Under this functional form, an increase in  $G$  by 1 dollar adds to the overall level of the public good the same amount that a dollar increase in  $S$  does. For instance, suppose that the public good provision consists in building public schools in a poor neighborhood. The additive production function assumed here means that a dollar that comes from firm's contributions to the public good through CSR will help finance the project the same way that a dollar that comes from the government would.

Second, we consider the *complementarity* scenario. To illustrate this case, a simple production function is considered:

$$Y^{comp}(t) = G(t)S(t)$$

Given this functional form, the government complements the provision of the public good by the firm. For instance, this could be the case of a firm providing access to drinking water and proper sanitation to students of a public school in a poor neighbourhood.

We consider a *benevolent Government* that aims at maximizing the social welfare given by the sum of the consumers' surplus - which includes the overall level of public good - and the firm's profits:

$$\max_t W^i(t) = CS_i(t) + \pi(t) = \frac{[\beta - (t + 1)]^2}{4} + Y_i(t) + \pi(t) \quad (1.15)$$

where  $i = \{subs, comp\}$  denotes the production technology of the public. It should be noted that producer's profits always fall in the tax rate for two reasons: the negative *net price effect* and the *demand reducing* effect. The former only considers the benefits and costs the monopolist incurs per unit sold due to a tax increase, regardless of the impact of such increase on the total quantity sold. On the one hand, the increase in the tax affects the level of CSR effort per unit sold chosen by the producer and this in turn will affect the price he charges. This net price effect ( $\frac{dp(t)}{dt} - \frac{ds(t)}{dt}$ ) is found to be *always* negative, that is, the unit price the monopolist obtains net of the CSR cost always decreases in the tax rate. Adding to this effect that the aggregate demand always decreases in the tax rate, profits always fall after a tax increase.

Furthermore, the tax reduces the responsible consumers' warm glow utility from pur-

chasing the good, even if it induces the monopolist to increase the CSR content of his product. This is mainly due to the exclusion of some consumers who no longer purchase the good. The firm sets the optimal price as to extract all consumers' surplus from the private good since consumers are not heterogenous in this dimension, but leaves some warm glow and prestige surplus to the responsible consumers. What ultimately determines the optimal tax rate to be imposed by the regulator is the resulting overall level of public good  $Y$  - given that it also reduces the firm's total CSR investments. Solving for the optimal tax rate yields the following result:

**Proposition 6.** *A welfare-maximizing regulator optimally sets:*

- *In the substitution case: A negative tax rate (subsidy) given by:*

$$t_W^{subs} = -\frac{\beta + 1}{2c^2 + 1}$$

- *In the Complementarity case: under the sufficient - but not necessary - condition*

$$c^2 < \frac{(3\beta - 4)(\alpha^2 + \beta^2)}{2} - 1$$

*the regulator optimally sets a positive tax rate  $t_W^{comp} > 0$ . (proof in the appendix)*

In the substitution scenario, both consumers' surplus and the monopolist's profits always decrease in the (positive) tax rate: it both narrows the pool of consumers and weighs negatively on the price; so the monopolist has disincentives to contribute to the public good. Furthermore, the amount of purchases that are being taxed decreases which weighs negatively on the tax revenues and hence the government provision of the public good,  $G$ , which is then insufficient to compensate for the monopolist's profits and the loss in consumers' surplus either. This suggests that a good public policy would be to subsidize the firm's product rather than tax it.

In contrast, when both forms of investments in the public good are complements, a benevolent regulator could optimally intervene on the market by setting a tax rate that allows it to finance a certain level of public investment,  $G$ , that is necessary for the firm's CSR investments to be beneficial for the consumers, that is, for the resulting public good,  $Y$ , to be sufficiently large to offset the losses of both the monopolist and the responsible consumers (from the warm glow utility).

Most interesting is the comparative statics on the values of  $t_W^{subs}$  and  $t_W^{comp}$ . We find that *more efficient producers receive higher subsidies if their CSR investments substitute*

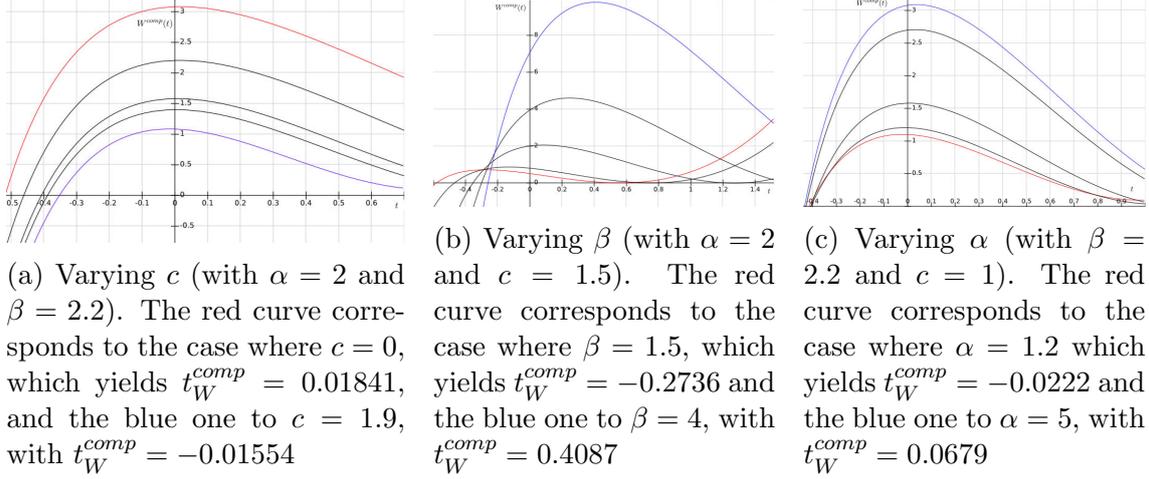


Figure 1.1: Comparative Statics on the value of  $t_W^{comp}$

for the government provision but higher taxes if they complement it. Efficient producers are then better off substituting for the benevolent government through their CSR activities. In the substitution case, a welfare maximizing regulator sets a higher subsidy the more consumers care about CSR activities of the firm (larger  $\beta$ ) and the lower his marginal cost in the private good production  $c$ . Intuitively, a larger social demand for CSR activities as represents by a larger  $\beta$  amounts to larger CSR investments at equilibrium which would give the regulator higher incentives to subsidize. However, a larger marginal cost gives the monopolist an opportunity to use the subsidy to compensate for his lack of profitability on the private good market rather than increase the CSR content of his product. A subsidy, as opposed to a positive tax, induces the monopolist to increase the CSR content of his product only if he is sufficiently efficient, because only then it would not be directed to subsidize his private activities.

In contrast, in the complementarity case, as illustrated in Figure 1, the socially optimal tax rate is also larger (smaller subsidy) the more CSR activities are demanded but the more efficient the producer is<sup>6</sup>. This result holds whether a higher tax induces the monopolist to increase or reduce the CSR content of his product ( $\frac{\beta}{1} \lesseqgtr \frac{\alpha}{c}$ ). The tax rate<sup>7</sup> thus increases in any factor that increases the producer's profit margin (higher  $\beta$  and/or  $\alpha$ , lower  $c$ ) because

<sup>6</sup>The values used in Figure 1A are  $\alpha = 2$ ,  $\beta = 2.2$ , and  $c \in \{0, 0.5, 1, 1.2, 1.9\}$  which yield optimal tax rates  $t_{W_2}$  of 0.01841, 0.01570, 0.0081, 0.0038 and -0.01554 respectively. In Figure 1B, they are  $\alpha = 2$ ,  $c = 1.2$ , and  $\beta \in \{1.5, 1.8, 2.5, 3.2, 4\}$ . In figure 1C, they are  $\beta = 2.2$ ,  $c = 1$ , and  $\alpha \in \{1.2, 1.5, 2, 3, 5\}$

<sup>7</sup>It can be easily verified in Figure 1 that, for the curves that are maximized with a negative tax rate, the parameters do not satisfy the condition given in Proposition 6. It should also be noted that as we vary the values of  $\beta$ ,  $\alpha$  and  $c$ , we vary the interval over which  $t$  satisfies the conditions  $\beta > (t+1)$  and  $\alpha > c(t+1)$ , it can also be verified that the ascending part of the welfare curves (in Figure 1) after achieving the maximum only occurs for values of  $t$  that do not satisfy the conditions and hence do not alter the results.

then the regulator can extract tax revenues to finance the public investment without hampering CSR activities and without causing a sharp decrease in both the monopolist's profits and the responsible consumers' surplus.

Recall that both marginal willingness to pay for the private and for the public components of the good have a positive effect on the price and hence on the monopolist's profits. Further, as the price increases, the proceeds from taxation increase and can be reinjected in the form of government provision of the public good which complements the CSR investments in this case and benefits both the responsible and irresponsible consumers. In contrast, as the marginal cost of the private good increases, the price of the private good increases but the monopolist reduces the CSR content, which has a negative effect on both the price and the responsible consumers' welfare. The tax revenues fall as well thus explaining the decrease in the social welfare. Nonetheless a higher tax needs to be imposed for the regulator to be able to extract a decent amount of tax revenues to finance the government provision of the public good, necessary to make the CSR investments useful.

This analysis suggests that, an economy where consumers have, on average, a high demand for firms to engage in CSR and value the private good to which CSR investments are linked, would benefit from government intervention through taxation. In that particular case, taxing CSR products *is* welfare improving and can serve as a *means of progressive taxation* or yields a *double dividend* as will be discussed further below, provided that the proceeds from taxation are used to enhance the productivity of such investments. Taxing those products becomes even more beneficial, in terms of a higher welfare, the more efficient the producers are in the production of the private good because then the crowding-out of private investment by the government provision will be minimized.

## 1.4 Alternative Objectives for the Regulator

So far we assumed that the regulator maximizes the social welfare. In this section, we extend the base model by assuming two alternative objectives for the regulator: maximization of overall level of public good and of tax revenues.

### 1.4.1 Maximizing Tax revenues

As the first alternative objective, consider a revenue-maximizing regulator. This is a reasonable assumption under most circumstances and can be justified by assuming a Leviathan-type government. Alternatively, revenue maximization objectives of the gov-

ernments can be justified when governments face severe revenue shortfalls; therefore, to them, their tax revenue becomes more important than private good consumption, warm glow utility and firm's profits. There is a single revenue-maximizing regulator, raising revenue only through taxes on products. His objective is then

$$\max_t G(t)$$

given by (14). The first-order condition of this maximization problem is given by<sup>8</sup>:

$$(2t^3 + 5t^2 + 4t + 1) = \frac{\alpha^2 + \beta^2}{1 + c^2} \quad (1.16)$$

From the implicit differentiation of (16), we find that *under a Leviathan-type government, inefficient producers are imposed lower taxes*. There are two points to consider when the objective is the tax revenues maximization: the per unit tax proceeds,  $t \times p(t)$ , and the tax base,  $Q(t)$ . The per unit tax proceeds clearly increases in all factors that make the monopolist more free-handed in increasing the price he sets for his product on which the tax is imposed. A higher marginal cost is one of these factors: a larger  $c$  increases the price by increasing the price he charges for the private component of the good, but also increases the CSR content of the product - through the *make-up effect* discussed in section 3 - and hence increases the part of the price attributed to CSR. This higher price however reduces the demand and hence the tax base (recall that  $\frac{dQ(t)}{dt} = -c$ ). Hence the revenue-maximizing regulator sets his tax  $t_{TR}$  at a value before the latter effect dominates and drags down the total tax revenues. This maximal value being smaller the larger the marginal cost  $c$  (as the reduction in demand is then stronger for lower values of  $t$ ), a lower tax rate is imposed on inefficient producers.

On the other hand, both marginal willingness to pay for the private good and for CSR have a positive effect on  $t_{TR}$  as they both increase the price, and hence the per unit tax proceeds, without reducing the tax base.

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<sup>8</sup>which yields a maximum whenever  $t \geq 0$  - which is always true for the maximization of tax revenues - since the second derivative:

$$-\frac{(1 + c^2)(t^3 + 3t^2 + 3t + 1) + (\alpha^2 + \beta^2)}{(t + 1)^3} < 0$$

is then negative

## 1.4.2 Maximizing Overall Level of Public Good

As the second alternative objective, assume a regulator who aims at maximizing the available level of public good, taking into account the nature of interdependence between the CSR investments and the public good provided through the government, that is

$$\max_t Y_i(t)$$

**The Substitution Scenario** The tax rate, denoted  $t_Y^{subs}$ , maximizes  $Y^{subs}(t) = G(t) + S(t)$  and thus solves the first-order condition<sup>9</sup>:

$$(2t^3 + 5t^2 + 4t + 1)(c^2 + 1) + 2(t + 1)^2 = \alpha^2 + \beta^2 \quad (1.17)$$

A necessary condition for a subsidy (negative  $t_Y^{subs}$ )<sup>10</sup> is that  $t < -\frac{1}{1+c^2} - \frac{1}{2}$ . From the first-order condition, it can be seen that it is more likely that  $t_Y^{subs} < 0$  the smaller the gap between  $(\alpha^2 + \beta^2)$  and  $(1 + c^2)$ - because only then can the positive effect that a subsidy may have on the monopolist's private investment in CSR offset its negative effect on the government's public investment, as will be discussed.

The comparative statics of  $t_Y^{subs}$  with respect to  $c$ ,  $\beta$  and  $\alpha$  respectively are illustrated in Figure 2. While a public-good maximizing regulator sets a lower tax rate (a higher subsidy) the more inefficient the producer is in the production of the private good, both a higher willingness to pay for the private good and for CSR activities induce the regulator to impose a lower subsidy ( a larger tax rate), as opposed to the socially optimal case. These comparative statics<sup>11</sup> suggest that a public-good maximizing regulator sympathises with inefficient producers and crowds out the CSR activities of the efficient ones.

**Lemma 7.** *In the substitution case, from a welfare maximization perspective, inefficient producers should be given lower subsidies, however from a public-good maximization perspective, they should be given larger subsidies (or imposed smaller taxes).*

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<sup>9</sup>which is also a maximum for all positive values of  $t$  since the second derivative is

$$-\frac{(c^2 + 1)(t^3 + 3t^2 + 3t + 1) + (\alpha^2 + \beta^2)}{(t + 1)^3} < 0$$

<sup>10</sup>and for the LHS in (17) to remain positive.

<sup>11</sup>The values used in Figure 2A are  $\alpha = 2$ ,  $\beta = 1.5$ , and  $c \in \{0, 0.5, 1, 1.5, 1.9\}$ . In Figure 2B, they are  $\alpha = 2$ ,  $c = 1.5$ , and  $\beta \in \{1.02, 1.1, 1.3, 1.5, 1.8\}$ . In Figure 2C, they are  $\beta = 1.5$ ,  $c = 1.2$ , and  $\alpha \in \{1.2, 1.5, 1.8, 2.2, 2.63\}$

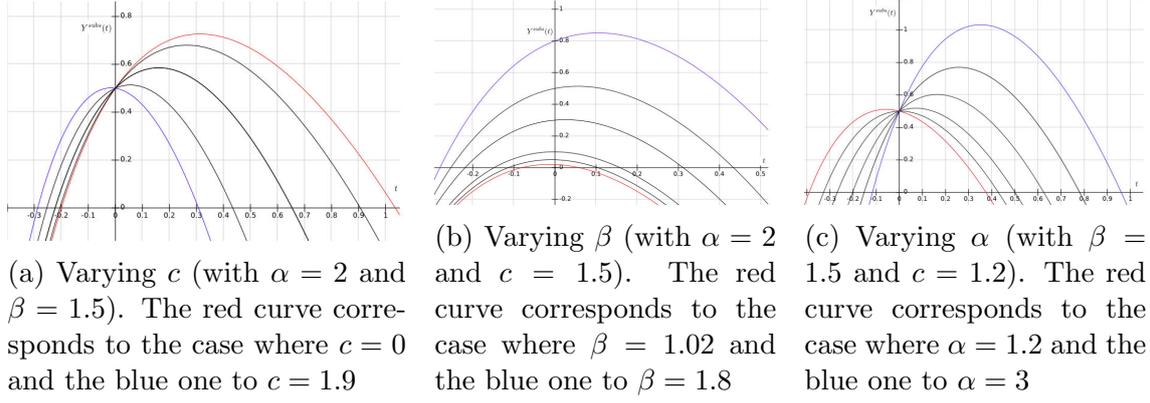


Figure 1.2: Comparative Statics on the value of  $t_Y^{subs}$

The idea behind this finding is that, to maximize welfare, the regulator takes into account the impact of the subsidy on the CSR content of the product as it affects the warm glow utility of the responsible consumers; inefficient producers are given less subsidies because the subsidy is likely to be absorbed to compensate for their lack of profitability on the private market rather than enhance the CSR content of the product. For the public good maximization purpose however, the regulator is more tolerant with inefficient producers: the profit margin of those producers being smaller, it is harder to extract tax revenues to finance a decent amount of public investment that is sufficient to offset the crowding-out effect of the tax. The regulator then has less incentives to tax. Furthermore, to increase their private investment in the public good, the regulator would have to bear the cost of their lack of profitability on the private market *and* offer them incentives to increase their CSR investment. They are then offered larger subsidies.

Once the objective is shifted towards maximizing the overall public good, the main point to consider is whether the monopolist's business is going well and hence whether there is room for government intervention. If the monopolist's business is *not* going well -either because he faces a high cost or a low demand for his product and CSR activities- the regulator is likely to offer a subsidy because then there is not much to tax and the government cannot extract enough revenues to substitute for the private provision of the public good through CSR, so having one public good provider is better than none. Only when the market's conditions are favorable for the producer (low  $c$  and/or high  $\beta$  and  $\alpha$ ), will the regulator consider taxing his product to generate revenues and finance the government provision.

**Proposition 8.** *In the substitution case, comparing the tax rate chosen by the regulator under different objectives,  $t_W^{subs} < t_Y^{subs} < t_{TR}$  always. (proof in the appendix)*

In the substitution case, a lower tax rate is needed when the objective is to maximize the overall level of public good rather than the tax revenues. This is because the public-good maximizing tax takes into account the crowding-out effect, that is the negative effect of the tax on the total CSR efforts exerted by the monopolist while the revenue-maximizing tax does not. Further, since the tax has a negative effect on both the monopolist's profits and the responsible consumers' welfare, the tax that takes those effects into account,  $t_W^{subs}$ , is even smaller.

Consider a monopolist who directs his CSR investments towards improving the living conditions for people in a remote village by providing safe drinking water for the disadvantaged homes for instance. If the aim of the regulator is to maximize tax proceeds, he would set a positive tax rate that leads to a reduction in the CSR investments and hence the services that would have been provided to that village are reduced. This could be the case of a government that faces a severe revenue shortfall that so forcefully led it to reduce the CSR investments of the firm to the benefit of some other public expenditures, or it could simply be the case by a Leviathan-type government.

On the other hand, if improving living conditions for disadvantaged homes is a national project, the regulator ought to either (i) tax the product of the firm engaging in CSR (if it is generating large revenues and hence there is room for government intervention) at a lower rate than in the previous scenario so as to leave the producer some incentives to engage in CSR, or (ii) to subsidize his product if he does not generate large revenues because in this case the government would not be able to generate enough tax proceeds to finance an amount of public good that compensates for the part of CSR investments it crowds out. If the product is taxed, this could be seen as a means of redistribution as discussed earlier. If it is subsidized, this means the government supports the producer to step in this particular area as taxing him would simply amount to less services being provided to the remote villages.

Finally, a welfare-maximizing regulator would always subsidize the monopolist and will not try to crowd out his investments, even if the tax proceeds could be recycled to finance the government provision and result in better access to safe drinking water, so as not to reduce neither the responsible consumers' warm-glow from contributing to helping the disadvantaged people, their prestige utility from buying the good, nor the profits that those activities enable for the monopolist.

**The Complementarity Case** The objective here is to maximize  $Y^{comp} = G(t)S(t)$  which yields the first-order condition:

$$\frac{(3t^4 + 10t^3 + 12t^2 + 6t + 1) - \beta(2t^3 + 5t^2 + 4t + 1)}{(t + 1)^2 - \beta} = \frac{\alpha^2 + \beta^2}{1 + c^2} \quad (1.18)$$

Let  $t_Y^{comp}$  denote the tax rate imposed in this case. The second-order condition is given by setting  $\frac{\partial Y^{comp2}}{\partial t^2} + (\frac{\partial Y^{comp}}{\partial t})|_{t=t^*} < 0$ , which yields

$$(t + 1)^2[(c^2 + 1)(3(2t + 1)(t + 1) - \beta(3t + 2)) - (\alpha^2 + \beta^2)] < 0$$

Intuitively, it makes no economic sense to have a subsidy in this case as it yields a negative overall level of public good<sup>12</sup>. The comparative statics are similar - not in the magnitude however - to the optimal  $t_W^{comp}$  - as shown in Figure 3<sup>13</sup>. A higher willingness to pay for the private component of the good raises both the total quantity purchased by consumers and the price the monopolist can charge for his good thus increasing the collected tax revenues. A higher social interest in CSR activities,  $\beta$ , increases both the per unit contributions of the monopolist and the premium he charges for CSR activities without affecting the demand, thus enhancing the public provision of the public good as well. A larger marginal cost,  $c$ , however reduces the public-good maximizing tax rate: it always reduces the tax revenues without affecting the total private investment and thus drags down the overall level of public good. Hence, it is also the case in the complementarity scenario that more inefficient producers should be imposed a lower tax rate to maximize the overall level of public good in the complementarity case. Here it is pointless to collect large tax revenues to finance the government provision if it will not be complemented by a proportional private investment in CSR.

**Proposition 9.** *In the complementarity case, comparing the tax rate chosen by the regulator under different objectives,  $t_W^{comp} < t_Y^{comp} < t_{TR}$  always. (proof in the appendix)*

The socially optimal tax rate is always below the public good maximizing tax for the same reason as in the substitution case, that is, it takes into account the negative effect

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<sup>12</sup>We thus only consider the cases where either  $\beta > 3$  or  $c^2 < \frac{(3\beta^2 - 2\beta + 3) + 8(\alpha^2 + \beta^2)}{3(3 - \beta)^2} - 1$  which are necessary conditions for  $t_Y^{comp}$  to be positive. Note that the SOC is satisfied for  $t_1 < t_Y^{comp} < t_2$  such that  $t_1 = \frac{\beta - 3}{4} - \frac{\sqrt{3}\sqrt{(c^2 + 1)[(3\beta^2 - 2\beta + 3) + 8(\alpha^2 + \beta^2)]}}{12(c^2 + 1)}$  and  $t_2 = \frac{\beta - 3}{4} + \frac{\sqrt{3}\sqrt{(c^2 + 1)[(3\beta^2 - 2\beta + 3) + 8(\alpha^2 + \beta^2)]}}{12(c^2 + 1)}$ . These conditions are necessary for  $t_2 > 0$

<sup>13</sup>The values used in Figure 3A are  $\alpha = 2$ ,  $\beta = 3$ , and  $c \in \{0, 0.8, 1, 1.5, 1.9\}$ . In Figure 3B, they are  $\alpha = 2$ ,  $c = 1$ , and  $\beta \in \{1.05, 1.5, 2.2, 3, 3.5\}$ . In Figure 3C, they are  $\beta = 2$ ,  $c = 1$ , and  $\alpha \in \{1.05, 1.5, 2.2, 3, 3.5\}$

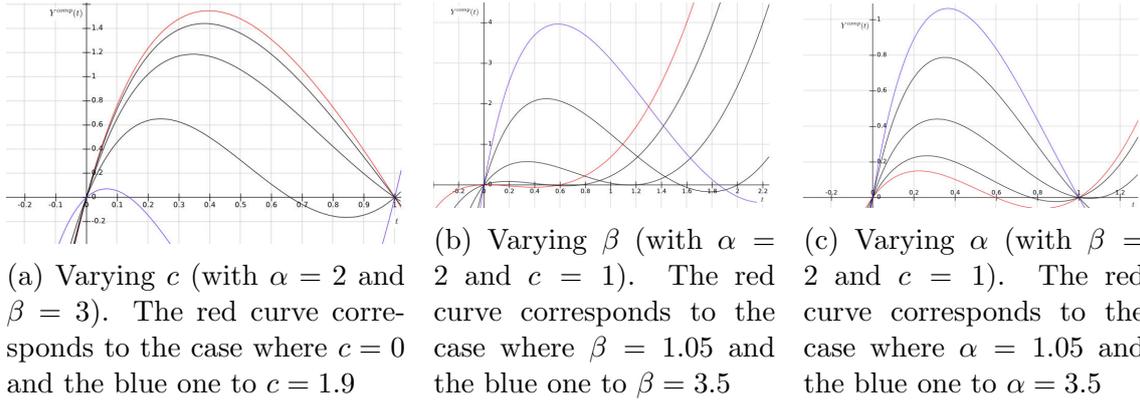


Figure 1.3: Comparative Statics on the value of  $t_Y^{comp}$

of the tax on both the monopolist's profits and the responsible consumers' utility (both from the prestige of being a responsible consumer and from warm glow). The public good maximizing tax falls below the revenue maximizing one. While  $t_{TR}$  aims at maximizing the tax revenues per se,  $t_Y^{comp}$  aims at achieving the highest level of public investment that can still be complemented by the monopolist's CSR activities. And since the productivity of the public investment is enhanced by the firm's CSR activities, the need to tax is lower;  $t_Y^{comp} < t_{TR}$  always holds.

Figure 4 summarizes the main findings of this section. It contrasts the optimal way a regulator intervenes on a market with CSR activities as well as the main criteria that determine the optimal tax rate, given different objectives and under different production technologies of the public good.

### 1.4.3 Discussion

Gathering the pieces of the puzzle together, we try to answer the question: *when should CSR products be taxed and when should they be exempted?* We argue that tax exemption is not always the best strategy to promoting CSR and enhancing the public good in the economy. Several factors should be considered, such as who are the actual tax payers and who are the main beneficiaries? What will the proceeds of taxation be used for? And finally, what is the social, economic and political context in which the regulator intervenes?

**Taxing CSR as a means of redistribution** Consider the case of a monopolist producing a private good for which consumers have a high willingness to pay and engaging, alongside its production, in CSR activities for which there is a large social demand - that is large  $\alpha$  and/or  $\beta$ . Imposing a consumption tax would lead him to reduce the price he charges for the impure public good he offers on the market, this decrease however is limited

		Production Technology of the Public Good	
		Substitution	Complementarity
The Variable the Regulator seeks to Maximize	Tax Revenues	<p>The tax increases in all factors that either increase the monopolist's unit price (per unit tax proceeds) and/or the total quantity purchased (the tax base)</p> <p>→ <i>Efficient producers are imposed larger taxes</i> because the demand-reducing effect of the taxes is then lower.</p>	
	Public Good	<p>How well is the producer's business going? Can the regulator extract sufficient tax revenues to offset the part of private investment he crowds out?</p> <p>→ <i>Inefficient producers are imposed lower taxes (or offered higher subsidies) -</i> because they are both harder to extract tax revenues from and need higher incentives to increase their CSR investments.</p> <p>→ <i>Progressive tax and possibility of a double dividend when <math>t &gt; 0</math>: higher income consumers are taxed to allow for the government to crowd out the private investment thus maximizing the level of public good</i></p>	<p>How well is the producer's business going? How much of the public investment is needed, given that its productivity is enhanced by the CSR investments?</p> <p>→ <i>Efficient producers are imposed larger taxes</i></p> <p>→ <i>Progressive tax and possibility of double dividend: higher income consumers are taxed to maximize the level of public good while exploiting complementarities between private and public investments.</i></p>
	Social Welfare	<p>Will the subsidy be absorbed in compensating the lack of profitability of the producer on the private market or will it help increase the CSR content of the product and/or the total CSR investments?</p> <p>→ <i>Efficient producers are given larger subsidies</i></p>	<p>Can the regulator increase the taxes without hampering the private investment? To which extent will the producer's profits and the consumers' welfare from warm glow be reduced?</p> <p>→ <i>Efficient producers are imposed larger taxes (lower subsidies)</i></p> <p>→ <i>Progressive tax and possibility of a double dividend when <math>t &gt; 0</math>: higher income consumers are taxed to increase total welfare.</i></p>

Figure 1.4: The tax rate under Different Scenarios: Summary of the Main Results

since he can always exploit the strong interest in his product. In the complementarity case, the government intervention through a consumption tax can actually be welfare-improving: purchase of the good would be restricted to a narrower group of green consumers, and if we admit social consciousness to be correlated with income, this means that the tax would be paid by the wealthier. While the responsible consumers, who still buy the good after it has been taxed, gain some surplus from both the now higher prestige of being a responsible consumer and from warm glow (if the CSR content per unit increases), their gain is always offset by the loss of consumers with  $\theta < \theta^*$  who can no longer purchase the good, and thus the effect on consumer surplus from participation is always negative. However, the overall level of public good available in the economy would increase. The monopolist clearly loses some of his profits. This scenario can be seen as a means for *taxing the richest*, where the wealthier pay more to make the public good available for the poorer. The intuition is close to taxing luxury goods, the mechanism behind however is different, and it is only valid when the firm is sufficiently efficient in the production of its private good, when that good is strongly demanded on the market and when the average social interest in CSR in the economy is sufficiently large.

Our findings suggest that, among producers engaging in CSR, only the efficient ones in the private production should be taxed if the private and public investments are complements. This is because for the inefficient ones, the regulator is unable to extract an amount of tax revenues that would make it worthwhile to tax them. In that case, the tax causes a sharp decrease both in the monopolist's price and total quantities purchased. The resulting tax revenues are then insufficient to finance a decent amount of the government provision of public good to make taxation justifiable. So when the government provision is necessary for the CSR activities to be productive, and when the producer is sufficiently efficient so that his profit margin is sufficiently large for the government to extract revenues from it without causing sharp distortions, he may choose to tax the good to enhance the overall public good in the economy. A subsidy in the complementarity scenario, when the producer is sufficiently inefficient, means the regulator chooses to yield surplus to both the responsible consumers (whose pool would then widen) and the monopolist at the cost of an underprovided public good in the economy. In the substitution case, a welfare maximizing regulator would always resort to a subsidy and rather rely on the private provision of the public good<sup>14</sup>. Perhaps if one allows for the productivity of public and private investments in the public good to be imperfect substitutes, the idea of

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<sup>14</sup>When both the government and CSR investments are equally productive in the public good production.

taxing CSR as a means of progressive taxation could appear in the substitution scenario, but under this setup, it does not.

**Complements or Substitutes?** The regulator should set different tax rates that depend on whether the CSR activity in question complements or substitutes for the government efforts. A *welfare-maximizing* regulator always chooses a lower tax rate (a subsidy) when the CSR activities of the monopolist can substitute for the government provision of the public good than when both forms of investments are complements. This is because a higher degree of government intervention is needed in the case of complementarity, which requires the regulator to raise the taxes.

However, if the objective is to *maximize the overall level of public good* in the economy, we do not have such clearcut answers to which tax rate should be higher, that is, it is not straightforward whether  $t_Y^{comp}$  is larger or smaller than  $t_Y^{subs}$ . This question is of particular importance when the aim of the regulator is to enhance the provision of a certain public good, either because it is underprovided in the economy and/or it is on the national agenda. For instance, if the aim is to maximize the provision of the public good *children education*, should a firm investing in establishing schools and developing training programs for teachers face the same taxes as another one that finances awareness campaigns about the topic? A priori, one would expect the regulator to grant larger tax privileges to the first. The answer however is not straightforward and different factors are into play.

On the one hand, the government ought to be more free-handed to increase the tax rate and crowd out the private investment in the public good which is always decreasing in the tax rate in the substitution scenario since a reduction in CSR, even though is not desirable, does not reduce the productivity of the government provision of the public good. Whereas the choice of  $t^{comp}$  takes into account both the negative effect of a high tax rate on the private investment, and the positive effect of the high tax rate on the public investment up to the point where it is complemented by the former. So a high tax rate would, not only harm the private investment (CSR efforts), but also hampers the public investment due to the existence of complementarity. The government is not able to *surpass* the monopolist in a way. It is then more likely that  $t_Y^{subs} > t_Y^{comp}$ . But on the other hand, it is useless to reduce the tax in the complementarity case if it still induces the price to fall and hence reduces the tax revenues that are necessary for the government to undertake the public investment which complements the CSR efforts that the tax reduction aims to encourage in the first place. A priori, one would expect  $t^{comp}$  to be greater than  $t^{subs}$  if it induces the monopolist to increase the CSR content of his product and hence the resulting fall

in the unit price would not be sharp, which in turn reduces the fall in the tax revenues. Since his part of the model is difficult to solve analytically, to demonstrate our main argument as simply as possible, we present numerical examples. In table 1, we consider consumers receiving moderate benefits from both the private and CSR components of the good,  $\beta = \alpha = 2$ , and facing a monopolist who is more or less efficient -  $c$  ranges from 0.3 to 1.9.

	c=0.3	c=0.5	c=1	c=1.5	c=1.9
$t_Y^{subs}$	0.4151	0.3801	0.2599	0.1398	0.0581
$t_Y^{comp}$	0.3584	0.3489	0.3007	0.2179	0.1385

Table 1.1:  $t_Y^{subs}$  vs.  $t_Y^{comp}$  for different values of  $c$ , with  $\beta = \alpha = 2$

We then assess the impact of varying  $\alpha$  and  $\beta$  on the respective values of  $t_Y^{subs}$  and  $t_Y^{comp}$  in tables 2 and 3.

	$\alpha = 1.3$	$\alpha = 1.5$	$\alpha = 2.5$	$\alpha = 3.5$	$\alpha = 4$
$t_Y^{subs}$	0.1247	0.1604	0.3684	0.5956	0.7010
$t_Y^{comp}$	0.2464	0.2631	0.3924	0.3646	0.3826

Table 1.2:  $t_Y^{subs}$  vs.  $t_Y^{comp}$  for different values of  $\alpha$ , with  $\beta = 2$  and  $c = 1$

	$\beta = 1.1$	$\beta = 1.3$	$\beta = 2.5$	$\beta = 3$	$\beta = 3.5$	$\beta = 4$
$t_Y^{subs}$	0.0921	0.1247	0.3684	0.4812	0.5956	0.7010
$t_Y^{comp}$	0.0471	0.1247	0.3990	0.4920	0.5826	0.6705

Table 1.3:  $t_Y^{subs}$  vs.  $t_Y^{comp}$  for different values of  $\beta$ , with  $\alpha = 2$  and  $c = 1$

The question that arises is: *When the main concern is the amount of public good provided, that is when the public policy aims at maximizing the overall level of public good in the economy, should producers be imposed larger taxes when their CSR investments complement or substitute for the government provision?* A higher tax should be imposed on producers who provide a CSR investment that complements the public investment rather than substitute for it when (i) they are relatively inefficient, (ii) their private good is weakly demanded on the market and (iii) consumers' interest in CSR activities is not too low and not too high.

Tables 1 and 2 show that the public good maximizing tax rate tends to be larger in the case of complementarity when the marginal cost is relatively large ( $c \geq 0.8$ ) and the marginal

willingness to pay for the private good is relatively low ( $\alpha \leq 3.5$ ), that is, when the monopolist is likely to increase the CSR content of his product to generate the make-up effect discussed in section 3. In this case, a higher  $t_Y^{comp}$  does not cause a sharp decrease in the price and hence the negative effect of a higher tax rate on the total tax revenues is limited *and* so is its negative effect on CSR investments. In the substitution case, this translates into the trade-off between the private and public investment being in favor of the former and hence  $t_Y^{subs}$  is smaller to avoid crowding-out.

The effect of  $\beta$  on this comparison, as can be seen from table 3, is not so direct. For  $\beta$  close to 1 (which is the marginal cost of CSR), it is not worthwhile for the regulator to tax the monopolist in the complementarity case since, on the one hand, there is not much to tax and, on the other, there is not much CSR investment to complement. In the substitution case however the regulator has more incentives to step in and substitute for the monopolist's provision which is very low for this range of values of  $\beta$ . As  $\beta$  increases, not only does the monopolist's total private investment in the public good increase, but also the fall in the price due to taxation is reduced since consumers now have a higher willingness to pay for the CSR activities. This leads to a higher  $t_Y^{comp}$  since the regulator can now extract a decent amount of tax revenues *and* has the motive to do so, as the private investment he seeks to complement increases. For this range of values, in the substitution case, the regulator's incentives to crowd out the private provision are weak and hence  $t_Y^{subs} < t_Y^{comp}$ . For large values of  $\beta$  (precisely for  $\beta > 3.3$ ), the private investment in CSR is quite large, which increases the productivity of the public investment as well if they are complements, thus reducing the need to collect large tax revenues. However in the substitution scenario, the large CSR investments do not enhance the government's productivity and there is a large profit margin so a decent amount of tax revenues can be extracted to finance the public provision, so  $t_Y^{subs} > t_Y^{comp}$ . *For sufficiently low and sufficiently large social interest in CSR, to maximize the overall level of public good, the regulator sets a smaller tax rate in the complementarity case:* in the first case, there is not much to tax nor much CSR investment to complement, and in the second, there is no need for high taxes since the large CSR investments enhance the productivity of the public investment.

Hence, a firm investing in establishing schools for children should face lower taxes than one investing in awareness campaigns about education if consumers have a moderately large interest in CSR activities and a low willingness to pay for the firm's private good, and when the firm has a relatively high marginal cost of production.

## 1.5 Conclusion

With the widespread of CSR activities and the multiplying number of tax exemptions they are accorded in many economies, questions arise about the positive and normative consequences of these practices as well as the adequate public policy. These questions become even more interesting once the nature of interdependence between the firms' CSR investments and the public good provided through the government - namely whether they are complements or substitutes - is taken into account.

Our first conclusion pertains to the *desirability of CSR*. When examining the pricing strategy of the CSR product, we find that, for each dollar donated to social causes via the purchase of the good, consumers actually pay more than one dollar. That is, the firm always finds it optimal to charge a price premium for the CSR content of its good. This finding raises questions about the desirability of CSR in a monopoly setup. It is perhaps not the best form of private provision of public goods, unless there are complementarities between the production of the private good and the CSR effort of the monopolist (e.g. a large water-treatment utility setting up a program of digging water wells for poor, remote villages). We also find that CSR is welfare-improving only when the social interest in such activities or the average willingness to pay for CSR is sufficiently large relative to the willingness to pay for the private good. The impact of a consumption tax imposed on the impure public good is then introduced. The most interesting - and seemingly counterintuitive - result obtained is that a higher tax *increases* the CSR content of the product if the marginal willingness to pay to the marginal cost ratio is higher for CSR activities than for the private good that the monopolist produces, this is referred to as the *make-up effect*: it is as if the producer has two businesses and the tax, reducing the profitabilities of both, disproportionately, induces him to reallocate his resources so as to focus on the most profitable one.

The choice of the tax rate by a welfare-maximizing regulator is analyzed, assuming that the tax revenues are then recycled in the form of the government provision of a public good, which can either complement or substitute for the CSR investments of the monopolist. While it is always optimal in the case of substitution to subsidize the monopolist, it is optimal to tax him in the complementarity scenario so long as his business is not going so badly, that is if the demand he faces for both his CSR activities and his private good is not too weak and/or he is not too inefficient in the private production. In the latter case, *taxing ethical behaviour*, i.e. the impure public good, may be welfare-improving. The wealthier, those who can afford to purchase the CSR niche product, are then taxed

to make the public good available for everyone, in this sense, taxing CSR can be a form of redistribution. Following the same reasoning, in an economy where the public good is underprovided, a good public policy would be to impose a consumption tax on CSR products, whether the private and public investments are complements or substitutes. The public good provision can then be enhanced at the cost of reduced surplus for the responsible consumers and lower profits for the monopolist.

We conclude by pointing out a future research direction that we think is crucial when addressing *CSR and regulation in the context of developing countries*, which is the regulator's ties with businessmen in the economy, referred to as cases of *elite capture*, which is a widespread phenomenon in many developing, but also developed, economies. The case where businessmen use their political connections to enhance both their economic and political stance requires more sophisticated objective functions for the regulator. A corrupt government is usually modeled as a regulator that tries to maximize a weighted sum of the social welfare and a bribe or that tries to enhance its image in order to be re-elected. However corruption goes beyond these specifications in developing countries where the government itself consists of the most important businessmen in the economy. So, in a way, the producers themselves decide on the tax rate that they have to pay. This conflict of interests that occurs in the case of *Business Politicians* will be the topic of the next chapter. Instead of deciding on the tax rate, the business elite will be deciding on the political benefits that come alongside their CSR activities.



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## 1.6 Appendix

### Proof of Proposition 1

*Proof.* • From the first derivative  $\frac{\partial \pi(s,p)}{\partial p}$ , we obtain that  $p^*(s) = \frac{\beta+1}{2}s + \frac{\alpha+c}{2}$ . Setting  $\frac{\partial \pi(s,p)}{\partial s} = 0$  and substituting for  $p^*(s)$  yields  $s^* = \frac{\beta-1}{\alpha-c}$  that we plug into the foc with respect to  $p$  to obtain the optimal price  $p^*$ . Checking the second-order conditions:

$$\begin{aligned}\pi_{pp}|_{s^*,p^*} &= -\frac{4(\alpha-c)^2}{[(\alpha-c)^2 + (\beta-1)^2]} < 0 \\ \pi_{ss}|_{s^*,p^*} &= -\frac{(\alpha-c)^2[(\alpha-c)^2 + (\beta+1)^2]}{(\alpha-c)^2 + (\beta-1)^2} < 0 \\ \pi_{ps}|_{s^*,p^*} &= \frac{2(\beta+1)(\alpha-c)^2}{(\alpha-c)^2 + (\beta-1)^2}\end{aligned}$$

The determinant of the corresponding Hessian matrix is then

$$D|_{s^*,p^*} = \frac{4(\alpha-c)^6}{[(\alpha-c)^2 + (\beta-1)^2]^2} > 0$$

Hence  $(s^*, p^*)$  is clearly a maximum. Another value that obtains from the FOCs is  $s = \frac{\alpha-c}{1-\beta}$ , however it is a saddle point as the determinant of the corresponding Hessian matrix is equal to  $-\frac{4(\beta-1)^6}{[(\alpha-c)^2 + (\beta-1)^2]^2}$  which is always negative.

- For  $s$  to be positive, it has to be that  $\alpha > c$  and  $\beta > 1$ . To see this, we substitute the optimal values into the aggregate demand which yields  $Q^* = \alpha - c$ , which is positive only if  $\alpha > c$ ; and hence  $s^* = \frac{\beta-1}{\alpha-c} > 0$  only if  $\beta > 1$  as well.

If  $\alpha > c$  but  $\beta < 1$ , the monopolist abstains from CSR and sets the price so as to maximize  $\pi(p) = 2(p-c)(\alpha-p)$  which yields  $p^*|_{s=0} = \frac{\alpha+c}{2}$ .

□

### Proof of Lemma 3

*Proof.* In the absence of CSR activities, consumers' surplus is simply given by  $CS^0 = \int_0^1 \alpha - pf(\theta)d\theta + Y = \frac{\alpha-c}{2} + 0$ , assuming in this scenario that the overall level of public good is null since there is no government intervention. In the CSR case, total consumer surplus is

$$CS(s, p) = \int_{\theta=0}^1 [\beta s - (1-\theta)\frac{s^2}{2} + \frac{\theta^*(s,p)-1}{2} + \alpha - p + Y]f(\theta)d\theta$$

Substituting for the value of  $p^*(s)$  given by (5):

$$\begin{aligned} CS(s^*, p^*) &= \left[ \frac{\beta-1}{2}s - \frac{s^2}{2} \right] \int_{\theta^*}^1 f(\theta) d\theta + \frac{s^2}{2} \int_{\theta^*}^1 \theta f(\theta) d\theta + Y = \frac{(\beta-1)^2}{4} + Y \\ &= \left[ \frac{\beta-1}{2}s - \frac{s^2}{2} \right] (1 - \theta^*) + \frac{s^2}{2} \left( \frac{1}{2} - \frac{(\theta^*)^2}{2} \right) + Y \end{aligned}$$

Finally plugging in the equilibrium value of  $\theta^*$  and using the relation  $Y = sQ = \beta - 1$ , this expression reduces to:

$$CS(s^*, p^*) = \frac{(\beta-1)^2}{4} + \beta - 1$$

Total welfare in the benchmark model with CSR activities is thus greater than in the absence of CSR iff:

$$\begin{aligned} \pi(s^*, p^*) + CS(s^*, p^*) &> \pi^0 + CS^0 \\ \frac{(\beta-1)^2}{2} + \frac{(\beta-1)^2}{4} + (\beta-1) &> \frac{\alpha-c}{2} \end{aligned}$$

Solving the above inequality for  $(\beta-1)$  yields  $W(s^*, p^*) > W^0$  if  $(\beta-1) < -\frac{\sqrt{2}\sqrt{3(\alpha-c)+2}+2}{3}$  - which is always negative and hence there are no CSR activities in this case - or  $(\beta-1) > \frac{\sqrt{2}\sqrt{3(\alpha-c)+2}-2}{3}$ .  $\square$

## Proof of Proposition 6

*Proof.* • The optimal value of  $t_{W_1}$  is obtained from the first-order condition. It is always a maximum as the second derivative yields

$$-\frac{2c^2+1}{2} < 0$$

- Let  $x = (t+1)$ , the optimal value  $t_{W_2}$  that maximizes welfare in the complementarity scenario solves the first order condition given by:

$$3(c^2+1)x^4 - [(2\beta+1)(c^2+1)+c^2]x^3 + [(c^2+1) - (\beta^2+\alpha^2) + \beta c^2]x^2 + (\beta^2+\alpha^2)(\beta-1) = 0$$

Since  $\frac{dW_1}{dt} = 0$  at the optimum, the second order condition can be written as:

$$\frac{dW_1^2}{d^2t} = \frac{dW_1^2}{d^2t} - \frac{dW_1}{dt} < 0$$

which gives the condition for a maximum:

$$(3t^4 + 12t^3 + 17t^2 + 10t + 2)(1 + c^2) + (t^2 + 2t + 4)(\alpha^2 + \beta^2) < \beta c^2(2t + 1) + 3\beta(\alpha^2 + \beta^2) \quad (1.19)$$

with both the LHS and the RHS of the above inequality being strictly increasing functions in  $t$ . If the slope of the LHS( $t$ ) is greater than that of RHS( $t$ ), a sufficient condition for the above inequality to hold, for positive values of  $t$ , is that, at  $t = 0$ , the curve representing the LHS( $t$ ) be below that of the RHS( $t$ ). Setting  $LHS(0) = RHS(0)$  we obtain

$$2(c^2 + 1) + (4 - 3\beta)(\alpha^2 + \beta^2) < \beta c^2$$

that we rearrange to obtain the condition in the proposition. This condition is however unnecessary if  $LHS'(t) < RHS'(t)$  in (21).

□

## Proof of Proposition 8

*Proof.* • We first show that the value of  $t^*$  obtained from the FOC of  $t_Y^{subs}$  in (18) always yields a maximum. To see this, rewrite (18) as:

$$(t + 1)^2(2t + 1)(c^2 + 1) + 2(t + 1)^2 = \alpha^2 + \beta^2$$

Since the RHS of the above equality is always positive, for  $t < 0$  it has to be the case that

$$t < -\frac{1}{c^2 + 1} - \frac{1}{2} \quad (1.20)$$

Now we show that the SOC in (19) is always satisfied  $\forall t^* \leq 0$  obtained from the FOC. The SOC being given by:

$$-\frac{(c^2 + 1)(t + 1)^3 + (\alpha^2 + \beta^2)}{(t + 1)^3} < 0$$

It is clearly satisfied for both positive values of  $t^*$  and for  $t > -1$  (such that  $(t + 1) > 0$ ). Now consider the case where  $t < -1$  (which requires that  $c^2 < 1$  as can be seen from (22)), the SOC then reduces to

$$(c^2 + 1)(t + 1)^3 < \alpha^2 + \beta^2$$

Subtracting from the above inequality ( $\frac{1}{2} \times FOC|_{t=t^*}$ ) yields  $(1 - c^2)(t + 1)^2 < 3(\alpha^2 + \beta^2)$ , which is always satisfied given the constraints for the monopolist to engage in CSR  $\alpha > (t + 1)$  and  $\beta > (t + 1)$  and hence  $\alpha^2 + \beta^2 > (1 + c^2)(t + 1)^2$  always holds, and given that  $\forall c^2 < 1$ ,  $(1 + c^2) > (1 - c^2)$ .

- Now we compare between  $t_W^{subs}$  given in Proposition 6 and (negative values of)  $t_Y^{subs}$ . For the welfare-maximizing tax to satisfy the FOC in (18), it has to satisfy (22) as well, that is  $\beta < \frac{(3+c^2)(2c^2+1)}{2(c^2+1)}$ . Substituting the value of  $t_W^{subs}$  into (18) yields a LHS that is smaller than  $\alpha^2 + \beta^2$  under the above constraint on the value of  $\beta$ , implying that the welfare maximizing tax rate is always smaller (i.e. the subsidy is larger) than the public good maximizing rate  $t_Y^{subs}$ .
- To see the second part of the inequality given in the proposition, compare the first-order conditions (16) and (18) for  $t_{TR}$  and  $t_Y^{subs}$  respectively, which always yield a maximum for positive values of  $t$  as demonstrated by the respective second-order conditions (17) and (19). Since the LHS of (18) is simply the sum of the LHS of (16), which is an increasing function of  $t$ , and another positive function  $(t + 1)^2$ ,  $t_Y^{subs} < t_{TR}$  clearly holds  $\forall t_Y^{subs} > 0$  (and evidently  $\forall t_Y^{subs} < 0$  in the case of a subsidy since  $t_{TR}$  can never be negative).

□

## Proof of Proposition 10

*Proof.* Here we only compare positive values of  $t_{TR}$ ,  $t_Y^{comp}$ , and  $t_W^{comp}$  since both a negative  $t_{TR}$  and a negative  $t_Y^{comp}$  make no economic sense in our setup and a negative  $t_W^{comp}$  is clearly smaller than any other tax rate.

- We begin by comparing  $t_Y^{comp}$  and  $t_W^{comp}$ , the FOCs of which can be respectively re-written as:

$$[(3t^4 + 10t^3 + 12t^2 + 6t + 1) - \beta(2t^3 + 5t^2 + 4t + 1)](1 + c^2) + (\alpha^2 + \beta^2)[\beta - (t + 1)^2] = 0 \quad (1.21)$$

and

$$\begin{aligned} & [(3t^4 + 10t^3 + 12t^2 + 6t + 1) - \beta(2t^3 + 5t^2 + 4t + 1)](1 + c^2) + (\alpha^2 + \beta^2)[\beta - (t + 1)^2] \\ & = (\alpha^2 + \beta^2) + (t + 1)^2[\beta - (t + 1) - (c^2 + 1)] \end{aligned} \quad (1.22)$$

The LHS of both equations being decreasing functions of  $t$  (from the second order condition of  $t_Y^{comp}$ ),  $t_Y^{comp} < t_W^{comp}$  whenever  $RHS(22) > RHS(23)$ , that is

$$(t+1)^2(c^2+1) > (\alpha^2 + \beta^2) + (t+1)^2[\beta - (t+1)] \quad (1.23)$$

Recall that, for the monopolist to engage in CSR, it has to be that  $\alpha > c(t+1)$  and  $\beta > (t+1)$ , so the inequality  $(\alpha^2 + \beta^2) > (t+1)^2(c^2+1)$  always holds in our model and thus (24) can never be satisfied given the constraints on the parameters, it is always the case that  $t_Y^{comp} > t_W^{comp}$ .

- Now we compare  $t_{TR}$  and  $t_Y^{comp}$  with respective FOCs:

$$(2t^3 + 5t^2 + 4t + 1) = \frac{\alpha^2 + \beta^2}{c^2 + 1} \quad (1.24)$$

and

$$(2t^3 + 5t^2 + 4t + 1) = \frac{\alpha^2 + \beta^2}{c^2 + 1} \frac{[\beta - (t+1)^2]}{\beta} + \frac{(t+1)^3(3t+1)}{\beta} \quad (1.25)$$

The LHS of both equations being increasing in  $t$ ,  $t^{TR} > t_Y^{comp}$  whenever  $RHS(26) > RHS(27)$ , that is,  $3t^2 + 4t + 1 < \frac{\alpha^2 + \beta^2}{c^2 + 1}$ , which is always true at the revenue maximizing tax resulting from (26).

Adding those two results together yields the ordering of the different tax rates given in the proposition.

□

## Chapter 2

# Corporate Social Responsibility, Political Benefits and Reputation

### Abstract

We develop a model to explain stylized facts about CSR in different economies. The basic set up consists of a game, involving adverse selection, between firms that are heterogeneous in both their moral motivation and political opportunism on the one hand, and consumers on the other. Demand is solely based on firm's reputation in a perfect Bayesian equilibrium and Corporate Social Responsibility (CSR) is used as a signalling device. The focus is then on one feature that is crucial for understanding many political economy problems in developing countries: the fading effect of reputational sanction that comes along political benefits. We then extend the model to study the case of *Elite capture* where a group of business politicians determine the extent of political favors conferred to businessmen in the economy. Allowing firms to vary only in their prosocial motivation, the model helps explain the interdependence between their choices to engage in CSR and how such practices are perceived in a given economy.

*JEL classification:* D11, D21, D64, P16, P48, L21, H11, M14

*Keywords:* political economy, elite capture, oligarch, reputation, cause-related marketing, private provision of public good, corruption.

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## 2.1 Introduction

The aim of this paper is to lay out a theoretical framework to explain the use of CSR in different economies. It is mainly motivated by the situation in Egypt prior to the 2011 revolution. The rise to power of prominent businessmen in the ruling National Democratic Party (NDP), in the government, and in the People's Assembly (Egyptian Parliament) led to waves of anger during the tenure of Prime Minister's Ahmed Nazif's government. To the untrained eye, Egypt's Parliament list could easily be mistaken for a who's who of big business. To stay in one of the two clubs, you need to be a member of the other, a clear incestuous relationship between politics and money persisted in Egypt. According to varying estimates, up to a fifth of the People's Assembly were wealthy businessmen and the role of opposition was limited to that of a "ruling oligarchy" task. What is most interesting about this phenomenon is that those *business politicians* owned the firms that invested the most in public good provision through CSR.

For instance, the ex secretary general of Hosni Mubarak National Democratic Party (NDP), Ahmed Ezz, the steel magnate, was chairman of the budget committee at the Parliament at the same time. As part of his business CSR efforts, he would grant each of the 30,000 beneficiaries of the "build your house" project (which are mainly low-income youth) with one ton of free steel. The Chairman of Mansour Group, Egypt's leading private sector conglomerate (it has distribution, sales and service businesses for autos, retail goods and industrial equipment, distributes audiovisual and household products; it sells office equipment; and distributes marine, mining, and construction equipment) was transport minister under Mubarak's regime. Following the same trend, "Mansour Foundation for Development" engages in several CSR projects such as eradicating illiteracy, funding orphanages... etc. For instance, the water company *Hayat*, which is part of the Mansour Group, donates 8,000  $m^3$  of water daily to the locals for agricultural use. The company also donates electric power -100 kW/hr - that it generates in house and is used to power the village's school, main clinic, social services building, and the Mosque, free of charge (Al Mansour Sustainability Report, 2013). Another example is the ex Committee chairman of Industry and Energy in the People's Assembly, Abou El Enein, who is also chairman of Ceramica Group, one of the largest investment groups in Egypt. In 2001, he established "Abou El Enein Organization for Social Activities and Charity" that undertakes literacy, improving healthcare services, supporting SMEs and female-headed households.

If that was the whole story, having business politicians in the economy would have been unarguably a lever for economic growth. The flipside of the phenomenon needs however

to be considered. The state became weak and unable to provide the basic public goods, with a set of powerful firms dominating their respective markets, this was the first flame that triggered the revolution. Furthermore, all of the business politicians mentioned above and others faced corruption-related charges after the revolution including profiteering, squandering public funds, illegally allocating pieces of public land to businessmen among other charges. How is CSR viewed in Egypt? Some consider the elite to be the engine of economic growth as they are the unique constituency that is both able and willing to step in areas where the state fails to deliver. To others, this elite has weakened the economy by reaping the largest part of resources. In addition, there is an ongoing debate about whether the elite has deliberately weakened the democratic institutions through their capture of state politics. According to this opinion, it is in the elite's best interest to keep a weak state so that they can fill this gap, appear as the economy *saviors* and hence gain further political and economic powers.

A key variable that can clearly be read between the lines is *reputation*. CSR is mainly a game of reputation-building or signaling in such context. Business politicians may engage in CSR so as to appear prosocial, gain more public approval, get re-elected, keep their political stance which in turns guarantees their hegemony on the economy. But in doing so, do they reduce the provision of public good through the government? Back to the classic dichotomy, is there a trade-off between CSR and public provision? Assuming that consumers/electors are rational and take into account the political benefits that come along CSR when forming their beliefs about the true motives for which good deeds are performed, does the fear of appearing greedy or opportunistic (and hence not being re-elected) discipline the business elite and prevent them from exploiting CSR for political ends? In other words, are reputational concerns underlying CSR sufficient to discipline the business politicians and restrict their ability to abuse their powers?

These questions are of particular importance to any developing country ruled by an *elite* that cumulates both economic and political powers. A case in point is the russian business *oligarch* that control the decision-making in the political sphere or the ruling indian *panchayati*. We build a model that may explain those mixed signals that CSR sends in the context of a business elite.

As is increasingly standard, *reputation* here refers to beliefs about firm's type that are affected by actions - rather than trust building over a long lasting relationship. Based on this mere mechanism of reputation, the model also allows to explain why CSR is viewed differently from one developed country to the other, aside from politics. For instance,

why are CSR activities in the U.S. considered as an act that only large reputable firms would do, whereas in most European countries, firms that do not engage in CSR are so negatively viewed that they constantly face boycotts and protests from consumers and NGOs?

Building on these stylized facts and using the tools of information economics, we answer two main questions: *How different levels of participation in CSR emerge in different economies?* and *How are CSR activities viewed by consumers in each configuration?* The paper is organized as follows. Section 2 lays out the benchmark model with a general form distribution and heterogeneity in both firms' benevolence and political greed. The aim is to study the reputational sanction brought about by political benefits that come along CSR to assess the impact of the amount of those benefits - and hence of the existing ties between politics and business - on firms' reputation. Section 3 provides two variants of the model, each followed by a short discussion. First, the choice of the amount of political benefits is endogenised by one of the firms, in an attempt to explain why a given level of political benefits would prevail, thus explaining the reputational mechanism in cases of *Elite capture*. Second, we present the Bénabou and Tirole (2006) analysis where firms are assumed to be heterogenous only in their public spiritedness, to study how different CSR configurations could emerge, disregarding the political factor, from the mere distribution of firms' types which gives rise to either a configuration where CSR is a common practice or one where it is a heroic act. Those results are then mobilized to explain the differences in CSR practices in European versus American companies. Section 4 concludes.

## Related Literature

Our work is related to and contributes to three strands of recent research in economics and political science: the recent works on 'political CSR', the 'business politicians' literature and the literature on 'intrinsic versus extrinsic motivations'.

**Political CSR and Corporate Political Activities** Recent discussions in the field of corporate social responsibility (CSR) have highlighted that CSR should be understood politically, because firms increasingly provide public goods and engage in business regulation, thus assuming state-like obligations (Scherer and Palazzo, 2007, 2011; Whelan, 2012). Yet, many firms also operate *politically* in a more traditional sense, interacting with governmental decision-makers in an attempt to control their external environment by

protecting and advancing their political interests, for instance, by lobbying policy makers, forming coalitions, and making contributions to political campaigns (Baron, 2003; Getz, 1997; Hillman, Keim, Schuler, 2004). The first approach, what Rasche (2015) calls the ‘Political CSR’, emerges from the presence of regulatory gaps, and hence challenges the traditional division of labor between business and government (Scherer and Palazzo, 2011).

The second approach, referred to as the ‘Corporate Political Activity’ (CPA), rests on the assumption that the governments still set the rules of the game, so firms want to protect themselves from perceived environmental threats or they want to leverage opportunities in their relationship with the government. Although both approaches differ, they complement each other in explaining real-life corporate behaviour. So far, little attention has been given to this matter, particularly when a firm’s provision of public goods through their CSR efforts (political CSR) enables it to widen its political network (CPA). Perhaps the paper that addresses a somehow similar question, from a managerial perspective, is Don Hond et al.(2014). We thus contribute to this literature by providing an economic analysis to how firms jointly manage their political and CSR activities, as well as the reputational impact thereof.

**Business Politicians** Our work also relates to the literature on ‘politically connected firms’ (Faccio, 2006). A firm’s political ties can be the result of politicians moving from the political arena to the business environment or vice versa - referred to in the political economy literature as *revolving door* (Chen et al., 2011; Boubakri et al., 2012; Duchin and Sosyura, 2012). The first direction in this literature is to identify the factors that favor links between politicians and businesses (and, at extreme, a mix of types). First, an economy with high levels of corruption and weak legal systems presents fertile grounds for strong political connections (Chen et al., 2011). Second, the presence of dominant owners facilitates the exchange of favors with political elites, as the concentration of ownership offers the necessary stability to negotiate favors with politicians (Morck et al., 2004). Finally, the presence of family owners fosters firm’s political ties since, as a result of their position, they tend to maintain long-term control of a company and thus provide the necessary stability for political ties to emerge (Morck and Yeung, 2004). In the absence of legal compliance, to protect the company wealth, to which a large part of the family elites’ wealth itself is linked, they can also obtain political status.

The second direction is to take the presence of political ties as given and assess its impact on various questions such as the relationship between the judiciary and the political class in Italy (Della porta and Vanucci, 2007) or the role of Russia’s *oligarch* in the

country's transition to capitalism (Guriev and Rachinsky, 2005). Our paper bridges the gap, in a way, between those two research directions: rather than taking political connections as given, we endogenise their formation and assess their impact on public policy. A similar intuition can be found in Gehlbach et al.(2010) who find that the *underlying institutional environment rather than political connections per se may determine whether policy is biased toward the preferences of politically connected businessmen*. Yet the analysis here differs from Gehlbach et al.(2010) in that, rather than the democratic institutions, it is the public policy - precisely, the amount of public good in the economy that will be chosen by the Elite - that determines the extent of political favors and at the same time is influenced by it.

**Crowding-out of intrinsic vs. extrinsic incentives** Aside from the political economy aspect, our model builds on the extensive economic literature of crowding out of intrinsic incentives (firm's culture or prosocial orientation) by extrinsic ones (the political gains that come along business). When incentives - in the form of political benefits offered alongside CSR activities - are designed to induce a certain behaviour, crowding may explain counterintuitive outcomes. For instance, a fine imposed on parents for picking up their children late from daycare resulted in more parents picking up their children late; the intrinsic incentive - feel of shame or guilt - has been replaced by an extrinsic one - the monetary cost - thus justifying the adverse behaviour (Gneezy and Rustichini, 2000). Crowding out of intrinsic incentives by monetary or extrinsic ones has been extensively analyzed (see Frey and Jegen, 2001, Frey and Stutzer, 2006).

Bénabou and Tirole (2003) provide a theoretical analysis for the adverse effect of incentives. The authors take the analysis one step further in Bénabou and Tirole (2006) by adding a third type of utility - to the intrinsic and extrinsic ones - that is, the *indirect intrinsic incentives* or the *reputational concerns* (Johanesson and Ellingson, 2008). Reputation is a crucial strategic variable that fits well the firm's objective of profit maximization as will be shown in the analysis. The key innovation of this class of models is to assume that each agent (firm) has an action - that is, either to participate in CSR or abstain - that is optimal for her to take on moral or ethical grounds and for political reasons, and receives an additional payoff from taking this action. Moreover, what is the *ethical* and what is the *opportunistic* thing to do for each firm is not predetermined, but is instead endogenously derived as an equilibrium outcome of a game.

The present model is inspired by Bénabou and Tirole (2006) but varies in several aspects. First, they focus mainly on the image-spoiling effect of politics in a normal dis-

tribution of types setup without considering that this effect fades away as larger extrinsic incentives are offered. Our focus is particularly on the *fading nature* of this effect as we study the threshold above which reputational sanction ceases to work; i.e. extrinsic incentives cease to crowd out the intrinsic ones, and for some distributions, there may even be a crowding in effect. The main difference between our paper and Bénabou and Tirole's is thus the question considered. Second, in the benchmark model, instead of limiting the analysis to normal distributions, we assume *general form distributions* of types to derive the basic insights. Third, while they consider a continuous choice variable (i.e. firms can invest different amounts in CSR activities), we consider a *binary choice* of CSR participation to make the notions of honor and stigma in both participation and abstention clear. Finally, we *endogenise the choice of extrinsic incentives, by one of the agents*, to analyze questions of corruption and elite capture.

In line with the previous chapter, we view Corporate Social Responsibility (CSR) as the corporate provision of public goods. Beside firms investing in community development projects and donating to social causes, we also view enhancing work conditions for employees, the avoidance of child labor and the reduction of carbon emissions as corporate provision of public goods (or equivalently a curtailment of public bads). The only form of CSR that is not considered here is those practices related to the product that the firm produces resulting in better characteristics of the product that yield private benefits only to its consumers, such as food and beverages that are free of pesticides or energy efficient appliances. Simply put, this paper studies a rather heterogenous group of CSR practices. Thus the term Corporate provision of public goods should be understood in a rather broad sense. We use the term CSR in preference to the narrower idea of firms contributing to the public good, which suggests a specific form of practices.

This definition of CSR suggests that it is a means by which firms intervene on the market to correct government failure in providing the public good. However, the government always intervenes on CSR markets: either directly through regulation (taxes, legislations, public policy,..) or *indirectly* in the case of business politicians. Both forms of intervention suggest that the dichotomy, i.e. the trade off between market provision of public goods via CSR and its public counterpart via the government, is always there. The direct more *classic* form has been extensively analyzed in the previous chapter as well as its welfare implications. The indirect form will be the focus of the analysis here. It ranges from simple political benefits conferred to businessmen engaging in CSR projects such as

a more lenient regulation or the access to wider political networks to help maintain and enhance their political and economic stance, to the extreme case of a ruling elite that determines the rules of the game. With this view of CSR in mind, we set up our basic model.

## 2.2 The Benchmark Model

In this section, we present a general model of CSR as a signaling device. We discuss the model as if the extrinsic motive behind CSR activities is political benefits and the firm cares about its reputation as it determines its consumers' demand. However, the model applies to any setup where firms' - as well as individuals' - extrinsic incentives crowd out their intrinsic ones via a feedback loop to reputational signaling concerns. We show that, above a certain threshold, this *disciplining effect* of reputation is reversed and extrinsic incentives come to strengthen the intrinsic ones.

### 2.2.1 The Signaling Game

The main idea is that firms have various motivations for exerting CSR. Those motivations being private information, consumers face a signal extraction problem.

#### Firms

The basic set up consists of a game between a continuum of firms, where  $i$  denotes a generic firm. Firms are heterogenous in both their moral motivation,  $x$ , and their political opportunism,  $y$ , as will be discussed below. Let  $(x_i, y_i)$ , the type of a firm  $i$ , be the realization of the joint distribution  $f(x_i, y_i)$ . For simplicity, we assume  $x$  and  $y$  to be drawn independently from two independent continuous distributions with respective densities  $f(x)$  and  $g(y)$  on the common support  $[0, V]$  and means  $\bar{x}$  and  $\bar{y}$ . The realization of  $(x_i, y_i)$  is private information, known to firm  $i$  but not observable by others. Alongside the private good, a firm can choose to contribute to the public good provision through CSR. Each firm faces a binary participation choice,  $s_i \in \{0; 1\}$ . Participation entails a cost  $C(s) = cs$ . Engaging in CSR activities allows the firm to reap both the intrinsic and extrinsic benefits - the level of which will be determined by the political multiplier in the economy  $k$ . Firm's  $i$  net *direct payoffs* from engaging in CSR are given by:

$$x_i + ky_i - cs_i$$

**Moral Motivation or Intrinsic Incentives** CSR can be intrinsically motivated by altruistic motives. Companies may have a culture of benevolence, in which helping their communities is an important value. A key variable in the analysis is then the firm's intrinsic valuation for contributing to the public good - denoted  $x$  hereafter - usually referred to in the economic literature as the *corporate culture*. Corporate culture here refers to how integrated CSR is in the firm's strategy. A higher  $x$  reflects the idea that CSR is intimately related to firm's conduct of business, which is a firm specific variable. In terms of payoffs, the moral motivation enables the firm to reap benefits if shareholders have social preferences,  $x$  then reflects direct utility from providing the public good and acts as a substitute for monetary gains.

Alternatively, intrinsic motivations may simply relate to prosocially held values and beliefs of executives that lead the company. While empirical evidence supports the view that CEOs tend to establish the ethical norms for corporations (Graafland and Smid, 2012), middle managers also play an important role in acting as socially responsible change agents and are able to exhibit their personal values through the exercise of managerial discretion. Employees can make a difference in an organization without a formally adopted CSR policy and contribute to the adoption of a CSR organizational culture. Examples are people in the company who are concerned about social problems and want to help, and the fact that it makes people in the company feel good to work on social problems. These reasons can be interpreted as intrinsic motives. That means that CSR is perceived as an end in itself because companies are concerned about social problems and derive meaning from CSR. In our setup, the moral motivation  $x$  refers to the degree to which the provision of the public good is an integrated objective of the corporation. It is a plausible assumption to consider that  $x$  varies across firms, this may be partly explained by different determinants such as company history, nature of business, preferences of the owner... etc.

**Political Benefits or Extrinsic Motives** Apart from the moral incentives, a firm that contributes to the public good is assumed to gain some political benefits, denoted  $k$ . A firm that contributes to the public good through CSR has access to wider political networks and hence faces a more lenient regulation - so CSR can be seen here as a form of lobbying - and/or obtains some sort of hedging against political risks that may arise. At extreme, if the firm owner is a business politician, contributing to the public good allows him to gain more popularity and hence enhances his chances in being elected in the government;  $k$  can hence be seen as the rate of return on CSR in terms of political gains. It should be noted that more political power grants more business gains and a

higher business stance allows wider political networks... etc. So  $k$  has a multiplying effect in terms of gains for the politically-oriented firm, that is why we denote it by *multiplier* and assume its value to be positive. The most important determinant of  $k$  is the existing level of public good in the economy as will be elaborated further. For the first part of the analysis, we consider  $k$  to be set by a principal and firms take it as given.

Although the political multiplier is the same for all firms, as it is economy-specific, firms vary in the degree to which they value these political benefits, what we call their *political opportunism* denoted  $y$  hereafter. It is likely that political greed increases with factors that foster political ties of the firm. For instance, the concentration of ownership in the corporation facilitates the exchange of favors with political elites and makes it more likely that the firm is keen on the political benefits it reaps from CSR. The presence of family owners increases the firm's valuation for political connections as to protect the company wealth. The presence of business politicians among the company's executives clearly has a similar effect. The type of sector in which the company operates plays an important role as well, for instance firms engaging in construction or other sectors involving bidding for public projects would be keen on having a wide political network.

## Demand

The firm's CSR choice is observable by its stakeholders: consumers, investors, employees, but also NGOs, government... etc. Upon observing the firm's choice  $s_i$ , stakeholders update their prior and form a belief about the firm's true type. This expectation translates into reputation for the firm that forms the demand of its consumers given by:

$$E(x_i|s_i) - E(y_i|s_i)$$

Consumers are assumed to care about, not only CSR exerted by firms, but also their underlying motives is that a firm that values its contribution to the public good (high  $x$ ) is assumed to provide it to the groups that need it the most and also continue to provide it in the future should any unforeseen contingencies take place. That is, CSR that is compatible with firm culture is more sustainable and more valuable. On the other hand, CSR that aims at obtaining political benefits lacks those two characteristics. When making their inferences, consumers thus take into account the value of  $k$  to discount for the political motives behind firms' choices.

**Firm's Image or Reputational Effect of CSR** In addition to the direct payoffs, firm's decision to engage in CSR carry reputational costs and benefits, reflecting the judgements of its stakeholders. A firm can have strategic monetary benefits from CSR on all labor, public, financial, social and product markets if it contributes to enhancing its image as being *prosocial*. A company with good reputation is able to attract morally motivated employees (Brekke and Nyborg, 2004), to avoid future laws and regulations (Calveras et al., 2007), to attract socially responsible investments (Geczy et al., 2005), to avoid social pressure and threats by activists (Baron, 2009) and finally to increase the demand for its product. For the ease of exposition, we assume that reputation for the firm represents the demand. This assumption is quite plausible in real-world situations and has various interpretations.

First, a firm deviating from a social norm like environmental protection, sound personnel policy or avoidance of child labor may risk punishment by consumers through boycotts, hence a reduction in demand. Examples of such punishments are numerous. Nestlé suffered from lost reputation after selling inappropriate breast milk substitute to pregnant mothers in developing countries. The plan of the firm producing the British condiment HP sauce to move production to the Netherlands caused a consumers' boycott in Britain (Glazer et al., 2009). Second, CSR can be a means of product differentiation. When competing firms producing identical products choose to engage in CSR, they enhance their corporate image which in turn affects the demand. CSR is thus seen as a signal for product quality especially if the product in question is a credence good. Equivalently, firm's reputation can be thought of as the consumer's willingness to pay for its product. As many customer surveys show, consumers willingness to pay increases in firm's reputation for doing good. Finally, firms known as *responsible* or *green firms* are more likely to attract investors. A plausible explanation for why stakeholders would rely on reputation is that, unlike costly information, reputation does not require sophisticated data or complex calculations.

## Timing and Information Structure

Summing up the *direct* and *indirect* payoffs, a firm of type  $(x_i, y_i)$  has an expected payoff:

$$\pi(x_i, y_i) = \begin{cases} (x_i + ky_i)s + [E(x_i|s = 1) - E(y_i|s = 1)] - c & \text{if } s = 1 \\ [E(x_i|s = 0) - E(y_i|s = 0)] & \text{if } s = 0 \end{cases} \quad (2.1)$$

We consider a simple two-stage game. Consumers do not know the firm's type  $(x_i, y_i)$  at any stage of the game, the political multiplier,  $k$ , however is common knowledge.

- First, each firm privately learns its type  $(x_i, y_i)$  and chooses whether or not to engage in CSR given the value of the political multiplier  $k$ .
- Upon observing  $s_i$ , the representative stakeholder (consumer, NGO, observer, employee, investor..) updates his beliefs about firm's identity that translates into a reputational return for the firm; which can be seen as the willingness to pay of the uninformed consumer.

## 2.2.2 Bayesian Equilibrium of the Game

Since firms' types are private information, the representative observer makes inferences about true types from observed behavior. The firm's choice of  $s_i$  reveals two underlying motivations: its culture or the intrinsic motivation and its valuation for political benefits from CSR or the extrinsic one. Since both vary across firms, a signal-extraction problem arises when an observer wants to learn about  $x_i$  or  $y_i$ . We now analyze the perfect Bayesian equilibrium of the game.

The incentive compatibility constraint of the above problem states that firm  $i$  engages in CSR if:

$$x_i + ky_i \geq c - \Delta_i(k) \quad (2.2)$$

where

$$\Delta_i(k) = [E(x_i|s_i = 1; k) - E(x_i|s_i = 0; k)] - [E(y_i|s_i = 1; k) - E(y_i|s_i = 0; k)] \quad (2.3)$$

is the *net* reputational return from engaging in CSR, after accounting for any stigma conveyed by the political benefits alongside CSR.

In the second stage, upon observing  $s_i$ , the posterior assessment of firm's type will solely depend on its participation/abstention decision and will be constant across firms making the same choice ( $\Delta_i(k) = \Delta(k)$ ). The above inequality can thus be represented graphically by the bold line in Figure 1A, along which firms are indifferent between participation and abstention, below that line firms (in A) choose  $s = 0$  and above it they prefer to participate  $s = 1$ .

Defining the variable

$$\eta(k) = c - \Delta(k) \quad (2.4)$$

the  $x$  and  $y$ -intercepts of the separating line can be re-written as:

$$\tilde{x} = \eta(k)$$

and

$$\tilde{y} = \frac{\eta(k)}{k}$$

An equilibrium of the game is a pair of cutoffs  $(\tilde{x}(k), \tilde{y}(k))$  which satisfies firms' participation constraints and is consistent with consumers' update of beliefs. Equivalently, equilibrium can be represented by the function  $\eta(k)$  as it determines both cutoffs and hence defines the equilibrium separating line between the participating and the abstaining firms, in Figure 1A, that yields a configuration where consumers' beliefs are consistent with firms' strategies.

**Lemma 10.** *The Bayesian equilibrium of the game is defined by the function  $\eta(k)$  that solves:*

$$\eta(k) = c - \frac{(\bar{x} - \bar{y}) - [\mu^-(\eta(k)) - \mu^-(\frac{\eta(k)}{k})]}{1 - I^A} \quad (2.5)$$

where  $\mu^-(\eta(k)) = E(x|x \leq \eta(k)) = \frac{\int_0^{\eta(k)} xf(x)dx}{1-F(\eta(k))}$  and  $\mu^-(\frac{\eta(k)}{k}) = E(y|y \leq \frac{\eta(k)}{k}) = \frac{\int_0^{\frac{\eta(k)}{k}} yg(y)dy}{1-G(\frac{\eta(k)}{k})}$  and  $I^A = \int_0^{\eta(k)} \int_0^{\frac{\eta(k)-x}{k}} f(x,y)dydx$ . This function then determines both participation cutoffs  $\tilde{x}$  and  $\tilde{y}$ . (proof in the appendix)

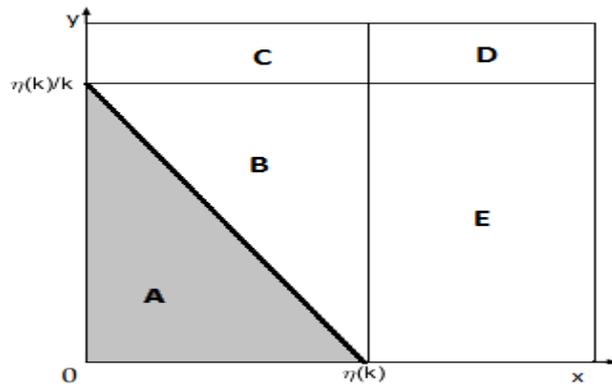
The function  $\eta(k)$  then defines the separating locus in Figure 1A such that firms engage in CSR whenever their type  $(x, y)$  falls in either B, C, D or E and abstain if it falls in A. From a given distribution of types  $f(x_i, y_i)$  and for a given value of  $k$  thus emerges a particular configuration of participation/ abstention which ultimately defines the *signaling content of CSR*.

### 2.2.3 Political Benefits and the Signaling Content of CSR

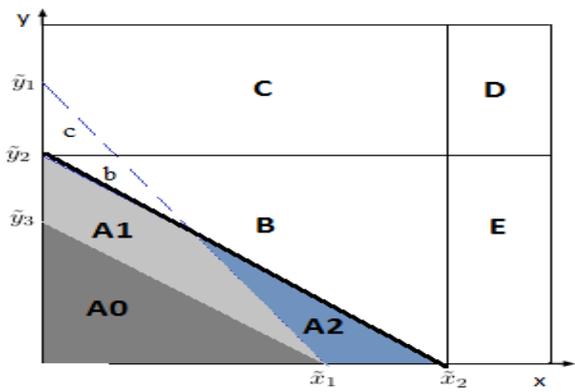
The main question we try to answer is: *does an increase in political benefits conferred to businesses spoil their reputation? And does this effect vary with the initial level of  $k$  and/or the distribution of firms' types?*

#### Main Results

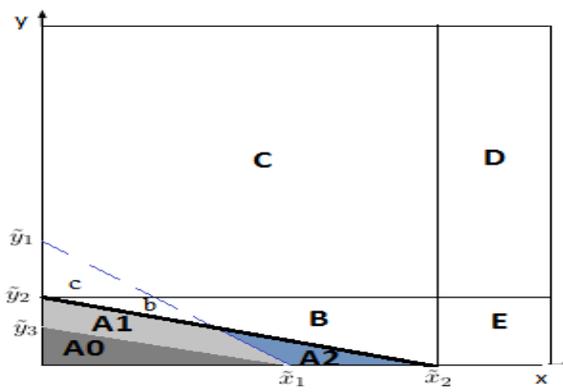
Differentiating the reputational return with respect to the political multiplier, we find that  $\Delta'(k) < 0$  (up to a given threshold,  $k^C$ , that will be defined further below), meaning



(a) Honor and Stigma from Participation and Abstention



(b) Effects of an increase in  $k$



(c) Honor and Stigma for large values of  $k$

Figure 2.1: The notions of Honor and Stigma when varying the Value of  $k$

that as more political benefits are offered to businessmen to reward them for their CSR projects, in the corruptive sense, the stigma from engaging in CSR increases faster than the honor attached to it and the reputational return is reduced. This is a generalization of the image-spoiling effect of extrinsic incentives that Bénabou and Tirole (2006) obtain in a normal distribution setup. Hence reputation can be seen as a disciplining tool. Two results however deserve further analysis: the *clean economies* result and that of *corruption as a social norm*.

**Lemma 11.** *In clean economies ( $k = 0$ ), a marginal increase in political benefits conferred to businessmen causes a sharp decline in CSR supplied by firms. That is:*

$$\lim_{k \rightarrow 0} \Delta'(k) = -\infty$$

*And thus both thresholds for participation tend to their maximal value,  $V$ . (Proof in the appendix)*

The signaling content of CSR is reversed at this specific point because it is where CSR turns from being a "good deed" to a politically beneficial activity and thus comes to be interpreted as a signal of opportunism rather than benevolence. In other words, the political rents are small relative to reputational loss. As the political multiplier increases, political returns will eventually outweigh the reputational effects and again act as an incentive to increase CSR. This result is consistent with what is frequently observed in developed versus developing countries. In the latter, political rents that come along CSR are quite important (in some cases it reaches the point of enabling the businessman to occupy positions in the government), resulting in an excessively large political multiplier. Reputational loss is also important, but since many firms engage in CSR however, consumers give them what we refer to as *the benefit of the doubt* as will be discussed further below. Whereas in developed countries, the political multiplier is bound to remain relatively low due to transparency, governance and regulatory issues. In this case, a small increase in  $k$  backfires; it is sure to attract the firms with the highest  $y$  and repel those with the highest  $x$  causing a large increase in the honor from abstention and a sharp increase in the stigma from participation. Therefore the smallest increase in  $k$  reduces CSR investments by firms in fear of appearing greedy.

**Proposition 12.** *(Corruption as a Social Norm)*

- *For any given distributions  $f(x)$  and  $g(y)$ , the reputational sanction that comes*

along political benefits fades away as  $k$  increases so that

$$\lim_{k \rightarrow \infty} \Delta'(k) = 0$$

- When the density of  $g(y)$  is increasing, a positive real value  $k^C$  exists such that, for  $k \geq k^C$  corruption becomes socially acceptable, in the sense that an increase in  $k$  does not spoil firms' image ( $\Delta'(k) \geq 0$ ), and thus reputation ceases to work as a disciplining tool.  $k^C$  is specific to each economy and is defined by:

$$k^C = \frac{-\Delta_1(k^C)I(k^C)}{y^C \frac{d\mu^-(y^C)}{dy^C}} \quad (2.6)$$

where  $x^C = \eta(k^C)$ ,  $y^C = \frac{\eta(k^C)}{k^C}$ ,  $\Delta_1(k^C) = E(x|s = 1; k^C) - E(y|s = 1; k^C)$ ,  $I(k^C) = \int_0^{x^C} (x^C - x)f(x)g(\frac{x^C - x}{k^C})$  and  $\frac{d\mu^-(y^C)}{dy^C} = \frac{dE(y|y \leq y^C)}{dy^C}$ .

The above proposition states that, for relatively *large* values of  $k$ , the disciplining effect of reputation disappears as the stigma that comes from engaging in CSR fades, regardless of the distributions of  $x$  and  $y$ . Only for some distributions however, there exists a level of political multiplier,  $k^C$ , above which the image-spoiling effect of politics is *reversed* in the sense that higher political benefits convey higher reputational return for the firms engaging in CSR. Assuming a positive value of  $k^C$ , as defined by (6), exists<sup>1</sup>, its value is likely to be lower when the distribution for political opportunism  $g(y)$  is increasing. Mathematically, if the density of  $g(y)$  is increasing, an increase in  $y$  will more likely increase the conditional mean in the lower tail  $\mu^-(y)$  since the weight reallocated at the margin is then relatively larger in that tail. As can be seen from (6), a larger  $\frac{d\mu^-(y)}{dy}$  implies a smaller  $k^C$ . In other words, economies consisting of businessmen that are, on average, eager politicians, are likely to accept the idea of firms having political ties more easily.

## Graphical Analysis

We now refer to Figure 1 to illustrate how the amount of political benefits conveyed to firms affects the reputation of both firms engaging in and abstaining from CSR and how the particular distribution of types in the economy comes to weaken or strengthen this effect.

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<sup>1</sup>which implies  $\Delta_1(k^C) < 0$  since all other terms are positive

**The notions of Honor and Stigma** To discuss the signaling content of CSR, we use the notions of *honor* and *stigma* to refer to the part of incentives behind the firm's choice that can be imputed to prosocial orientation and its counterpart for political greediness respectively. The honor from participation is then  $E(x|x \in B \cup C \cup D \cup E)$ , whereas that from abstention is  $E(x|x \in A)$ . In contrast, the stigma from participation refers to  $E(y|y \in B \cup C \cup D \cup E)$  and for the abstaining firms it is  $E(y|y \in A)$ . What renders the analysis complicated is that there are stigma and honor from both participation and abstention. Figure 1B better illustrates these notions *for the participating firms*:

- Area E represents the net honor from engaging in CSR; firms in E have a prosocial orientation that is at least as high as the most benevolent firm in the abstaining group *and* they are at most as greedy as their abstaining counterparts in A<sup>2</sup>. Those two effects combined enhance the image of firms engaging in CSR.
- In contrast, firms in C drag down the reputation of firms engaging in CSR; for the same expected value of benevolence, those firms have a level of political opportunism that is at least as high as the greediest abstaining firm<sup>3</sup>.

The three graphs in Figure 1 show how the notions of honor and stigma change as the value of political benefits increase. For low levels of  $k$ , the reputation of firms engaging in CSR is glittering as the honor from participation (E) is quite large relative to the shame caused by political benefits (C). However, as  $k$  increases, the signaling content of  $C$  varies: while firms in  $C$  originally drag down the responsible firms' reputation, for large values of  $k$ , they cease to do so. Firms in  $C$  still have a level of political opportunism that is at least as high as that of the abstainers. However for large values of  $k$  (in Figure 1C for instance), this level tends to  $\bar{y}$ ; and thus having the average degree of greed in the economy cannot be referred to as stigma. Firms in  $C$  now are on average as benevolent as the average firm in the economy as  $\mu^-(\tilde{x})$  tends to  $\bar{x}$ . The stigma from participation is thus dulled. This positive effect of larger values of  $k$  have on the reputation of the CSR firms will be further emphasized by an increasing density  $f(x)$  then the weight attributed to goodwill for firms in  $C$  will be larger and/or an increasing  $g(y)$  so that the stigma from belonging to  $C$  fades away after a few increases in  $k$ .

Analyzing the honor and stigma from abstention requires further dividing the abstainers into three subgroups: the sincere abstainers (those in  $A_0$ ), those who abstain from fear

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<sup>2</sup>Precisely, their reputation is given by  $E(x - y|(x_i, y_i) \in E) = \frac{[1-F(\tilde{x})]G(\tilde{y})}{1-I_A} [\mu^+(\tilde{x}) - \mu^-(\tilde{y})]$ .

<sup>3</sup>That is,  $E(x - y|(x_i, y_i) \in C) = \frac{F(\tilde{x})[1-G(\tilde{y})]}{1-I_A} [\mu^-(\tilde{x}) - \mu^+(y)]$

of reputational loss ( $A_1$ ) and those who abstain in the pursuit of honor ( $A_2$ ). Figure 1B explains the behaviour of each subgroup.

Our starting point is the dashed line on the graph with  $x$  and  $y$ -intercepts respectively given by  $\tilde{x}_1$  and  $\tilde{y}_1$ <sup>4</sup>, and slope  $-\frac{1}{k}$ . Now consider the effect of increasing political gains conferred to businessmen  $k$ , disregarding any reputational effect (i.e. assuming  $\frac{d\eta(k)}{dk} = 0$ ). This translates into a simple rotation to the left of the dashed line so that the  $x$ -intercept remains unchanged while the  $y$ -intercept falls to  $\tilde{y}_3$ <sup>5</sup>. The participation line thus becomes flatter: the set of responsible firms expands as the types in  $A_1 + b + c$  are drawn in. Once the reputational aspect is taken into account by firms, as represented by the bold line with  $x$  and  $y$ -intercepts  $\tilde{x}_2$  and  $\tilde{y}_2$ <sup>6</sup>, three effects occur at equilibrium: (i) some firms who would contribute before the increase in political benefits now don't - those who pursue the honor from abstention in  $A_2$ , (ii) others should have been dragged in but still prefer to stay out because they fear the reputational loss, those in  $A_1$  and (iii) others, those in  $b + c$ , are drawn in. The sincere abstainers however, those in  $A_0$ , stay out with or without reputational considerations. Now the notions of *honor and stigma for the abstaining firms* can be represented as:

- Firms in  $A_1$  raise the stigma from participation; the sum of their political and prosocial motives would induce them to contribute hadn't it been for the reputational concerns, they create doubts about the true motives behind abstention.
- The abstainers in  $A_2$  however raise the honor from abstention; they are of the highly public-spirited type and have a political opportunism that is relatively low, hence they enhance the image of the abstaining firms<sup>7</sup>.

As more political benefits are granted to firms engaging in CSR (comparing Figures 1B and 1C), the honor from abstention is emphasized: the expected goodwill of firms in  $A_2$  increases and their political opportunism further decreases. The stigma from abstention is not necessarily dulled as firms in  $A_1$  continue to have a considerable weight. A decreasing density  $g(y)$  strengthens the positive effect of larger political benefits on the reputation of abstaining firms<sup>8</sup> as it both dulls the stigma and raises the honor from abstention.

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<sup>4</sup>such that  $\tilde{x}_1 = \eta(k)$  and  $\tilde{y}_1 = \frac{\eta(k)}{k}$ .

<sup>5</sup> $\tilde{y}_3 = \frac{\eta(k)}{k} - \frac{1}{k^2}$ .

<sup>6</sup>where  $\tilde{x}_2 = \eta(k) + \eta'(k)$  and  $\tilde{y}_2 = \frac{\eta(k)}{k} + \frac{k\eta'(k) - \eta(k)}{k^2}$ .

<sup>7</sup>Firms in  $A_0$  however have no effect on reputation as they truly reveal their type, they do not affect consumers' inferences.

<sup>8</sup>or attenuates its negative effect, depending on the relative weights attributed to  $A_1$  and  $A_2$ .

**Initial Value and Distribution Effects** From the previous discussion, we can distinguish between two effects of the political benefits,  $k$ , on honor and stigma from participation and abstention. First, the *initial value effect* whereby larger values of  $k$  always dampen the disciplining effect of reputation: the stigma from participation is dulled and the honor from abstention is emphasized so that the gap between the reputation of the participating and abstaining firms is narrowing, CSR ceases to be interpreted by consumers an act of greed. While the value of  $k$  determines the *areas* of  $C$ ,  $E$ ,  $A_1$  and  $A_2$ , the distributions of  $x$  and  $y$  determine the *weight* attributed to each. The *distribution effect* refers to the idea whereby an increasing density  $g(y)$  increases the rate at which reputational sanction that comes along larger values of  $k$  fades away.

A priori, one would expect some economies to be susceptible to accepting corruption at some point (i.e. to have a fading reputational sanction) while others that have, for instance, a very low average political opportunism to be immune to that. However, we find that the initial value effect applies to all distributions. From the expression of  $\frac{d\eta(k)}{dk}$  (given in the appendix), we find that it is a function of  $\eta(k)$ ; meaning that the effect on the reputation of the new participants and abstainers has to be considered in light of the characteristics of the existing pool of participants. If businessmen in the economy already get large political gains for their CSR activities, one would expect the pool of participants to be already containing the firms with the highest political opportunism.

The Distribution Effect however is density-specific; if businessmen in the economy are on average eager politicians, they will be drawn in for small values of  $k$ . Hence small political benefits are sufficient to attract the relatively more opportunistic politicians. The new participants are therefore not so negatively viewed because consumers are aware that the bad types are already in. Stigma from engaging in CSR then fades faster than honor from abstention increases; firms being politically rewarded for their CSR activities becomes more easily accepted<sup>9</sup>. There is a large literature on how corruption can become a social norm<sup>10</sup>, this is not a novel finding, perhaps it is the Bayesian interpretation behind that is.

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<sup>9</sup>For the uniform distribution for instance as will be seen in the next section, the fading nature of the reputational sanction is present,  $\Delta'(k) < 0$ , so long as the political multiplier exceeds the marginal cost of CSR  $k > c$ , a positive threshold above which the image-spoiling effect is reversed  $k^C$  however is never attained (that is  $k^C \rightarrow \infty$ ) because  $\mu^{-1}(y) = 0$ .

<sup>10</sup>An extensive review for the literature on *Corruption as a Social Norm* will be given in the next chapter.

## 2.2.4 Discussion: When corruption becomes a social norm

To see the intuition behind the initial value and the distribution effect, we turn to a more thorough examination of how reputation,  $\Delta$ , and political payoffs,  $k$ , interact. The initial level of political benefits conveyed to businessmen in the economy defines both (i) the non-reputational payoffs and (ii) the pre-existing reputation. To illustrate that, we focus on the developing countries experience with corrupt behaviour versus that of a developed country where corruption is more restricted. In our set up, this amounts to comparing between two economies: a developing one, denoted A, and developed one, denoted B, such that  $k_A > k_B$ . Evidently, consumers' expectations of businessmen's motives behind CSR is not the same in A and B, given that in the former they get much larger political benefits for such activities.

First, we would expect the developing country's economic circumstances to be considerably different, as well as the boundaries between politics and business. It is very common that businessmen in economies like A are granted political favors as a reward for their CSR activities. The incentive to engage in CSR for political ends would be considerably higher in A than in B which is more strictly controlled. These incentives, and the fact that they are known to consumers, lead to a reduced expectation of firms in A doing CSR for strictly prosocial reasons. That is, the direct payoffs conveyed to businessmen counsel the use of CSR for political ends. Second, the preexisting reputation of businessmen in A for being politically disinterested is likely not glittering; i.e.  $\Delta(k_A)$  is likely to be originally low. In other words, consumers would think it more likely that firms in A, compared to B, would exert CSR efforts mainly to pursue political goals. This pre-existing reputation has the same impact as public knowledge of the high political rewards: following an increase in  $k$ , firms engaging in CSR in A will not suffer the same reputational loss that those in B would (i.e.  $|\Delta'_A(k)| < |\Delta'_B(k)|$ ). More generally, *in order to determine whether firms' actions will affect their reputation, it is necessary to know something about both reputational and nonreputational payoffs.*

**Non-Reputational Payoffs** When the nonreputational payoffs generate sufficiently strong incentives to use CSR for political gains, a decision to take advantage of that may not lead to any change in reputation. This could be so, for example, if a firm faced high political payoffs  $k$  that so forcefully called on it to engage in CSR for political ends that existing beliefs about firms and their reputation lead observers to expect political abuse of

CSR. Similarly, if an economy's nonreputational payoffs provide an incentive to do CSR mainly for prosocial reasons (very low  $k$ ), the decision to abstain after an increase in  $k$  will not lead to a reputational gain. Assuming that an economy behaves consistently with the expectations of observers, no change in the beliefs about businessmen in that economy will be warranted. Thus, perhaps counterintuitively, the fact that everyone believes that businessmen in corrupt economies are more likely to abuse CSR actually reduces the reputational sanction when such abuse occurs.

**Pre-existing Reputation and the Value of  $k$**  In addition to nonreputational payoffs, the impact of a decision on reputation depends on the reputation of firms already engaging in CSR in that specific economy. This perhaps better explains why in *clean economies*, the smallest increase in  $k$  induces a large reputational loss for the CSR firms. Consider for example an economy with very low  $k$  ( $k \rightarrow 0$ ). Firms engaging in CSR do so for strictly moral reasons. A slight increase in  $k$  would then counsel a group of firms - precisely, those at the high end of the distribution of  $y$  - to engage in CSR to benefit from the political rewards that come along. As the economy has a very strong reputation for goodwill prior to that increase in  $k$ , the decision of firms to abstain from CSR would reaffirm that good reputation, but may not increase it. On the other hand, the new entrants will be negatively viewed as they worsen the pool of participants which was very clean to start with. The reputational sanction is then very high.

**Pre-existing Reputation and the Distribution of Types** Now suppose the economy's nonreputational payoffs suggest using CSR for political ends ( $k$  very large), but its reputation is strong enough that observers anticipate firms not to take advantage of that. This could be the case of an economy with a distribution of firms' political opportunism,  $g(y)$ , that is skewed to the left; i.e. with a relatively small weight attributed to greedy firms. If businessmen decide to undertake CSR projects after an increase in  $k$  either way, observers will revise downward their estimate of political greed,  $y$ , of the new pool of participants, which causes a reputational loss. However, if the economy is highly corrupt with little reputation to start with (i.e.  $g(y)$  is skewed to the right so that the bad types are drawn in for small values of  $k$ ), the new entrant will not face any change in its reputation because its actions simply confirm existing perceptions.

To summarize, we can predict that the participation decision of businessmen in a given economy will enhance its reputation for political greed when its nonreputational payoffs

counsel taking advantage of CSR ( $k$  is large) and the preexisting reputation of firms engaging in CSR is insufficient to cause observers to expect abstention, which depends on both the value of  $k$ , but also on the particular forms of the distributions  $f(x)$  and  $g(y)$ . New participants will worsen the pool's reputation when the nonreputational payoffs, combined with the economy's existing reputation, predict abstention. The foregoing is really just a claim that observers engage in a Bayesian updating of their estimates of businessmen's true motives. The reputation of a given pool - participants or abstainers - is determined by that estimate, which can change over time, as  $k$  changes.

## 2.3 Explaining Different CSR Standards

In this section, we extend the model in two directions to explain different CSR configurations. First, assuming a uniform distribution of types, we endogenise the choice of the political multiplier, by one of the firms, to study the case of *Elite capture*. Second, we consider heterogeneity only in firms' moral motivation and thus set all firms' political opportunism to one to see how firms' decisions to engage in CSR will be interdependent and explain *why, apart from the political factor, in some economies most firms engage in CSR, while in others, only a few do.*

### 2.3.1 Model with Endogenous Political Multiplier

Consider a game with the players, strategies, and payoffs described in Section 2 and Figure 1. We extend the previous model by adding a first stage to the game where the value of  $k$  is determined.

#### Timing and Information Structure

For the sake of simplicity, we assume  $f(x, y)$  to be the joint distribution of two independent *uniform* random variables on the common support  $[0, V]$ . Furthermore, we fix a value for the marginal cost of CSR,  $c = \frac{1}{2}$ . The game proceeds as follows:

- Nature determines a type  $(x_i, y_i)$  for each firm that is only observable by the firm.
- In the first stage, a particular firm, wins a lottery and gets to determine the value of the political multiplier, alongside its choice of whether or not to exert CSR. This firm will be referred to as the *Elite* and denoted by  $E$  hereafter.

- Firms and consumers in later stages observe the choice of  $k$  but not the identity of the firm  $E$  that sets it.
- In the second stage, firms take the resulting value of the political multiplier as given and decide whether or not to exert CSR.
- Finally, consumers observe each firm's choice of CSR but not the underlying motivations -  $x_i$  and  $y_i$  - and decide on the demand which is simply their expectations of the firm's goodwill discounted for its political opportunism based on the mere participation or abstention decision.

The idea behind the particular assumption of the identity of the Elite being unobservable to consumers is to reflect the reality in many developing countries where citizens do not know who has influence over public policy. There are many businessmen with substantial political influence and each tries to divert public policy outcomes - the choice of the amount of public good in our setup - so as to maximize his own private benefits. Since these business politicians may have conflicting interests, it is assumed that, each time the game is played, only one firm - or an organized group of firms - succeeds. Upon observing the outcome, consumers are aware that its choice has been influenced by one of the businessmen, but because they are numerous, they cannot identify him. Another interpretation behind this assumption is that the business politicians who are able to influence public policy tends to hide their identity from their consumers, who are at the same time *electors*, so as not to reduce their chances of being re-elected. In the context of a more developed country, one could think of the business politicians as being the different industrial lobbies that try to influence public policy. The identity of the winning lobby remains unknown since they are numerous<sup>11</sup>. In other words, due to the presence of multiple business politicians or lobbies, the one that actually succeeds in influencing public policy gets the benefit of the doubt.

### **Bayesian Equilibrium of the Reputation Game in the Uniform Case**

The game is solved for a perfect Bayesian equilibrium in the sense that player  $E$  takes into account firms' and consumers' beliefs and best responses when making his choices. To solve this game we work backwards, starting from the last stage. A firm  $i$  chooses to exert CSR efforts if its direct payoffs and the reputational return on CSR exceed its cost;

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<sup>11</sup>However consumers/electors can speculate given that these lobbies have divergent interests.

that is:

$$x_i + ky_i > \frac{1}{2} - \Delta(k)$$

Following a signal  $s_i$ , consumers update their beliefs about firm  $i$ 's true type in a way that is consistent with the above constraint. Then, by Bayes' rule, the posterior is given by:

$$\Delta_1(k) = E(x|s = 1) - E(y|s = 1) = \frac{\eta(k)^3(k-1)}{2k[\eta(k)^2 - 2k]} \quad (2.7)$$

for firms engaging in CSR, and for the abstaining firms:

$$\Delta_0(k) = E(x|s = 0) - E(y|s = 0) = \frac{\eta(k)(k-1)}{2k} \quad (2.8)$$

which yields a reputational return on CSR of:

$$\Delta(k) = \Delta_1(k) - \Delta_0(k) = \frac{\eta(k)(k-1)}{\eta(k)^2 - 2k} \quad (2.9)$$

An equilibrium of the subgame is a pair of cutoffs  $(\tilde{x}(k), \tilde{y}(k))$  which satisfies firms' participation constraints and their perception of consumers' beliefs. Equivalently, we could define the equilibrium of the game as  $\eta(k)$  which solves the above equation. Substituting  $\Delta(k)$  by  $\frac{1}{2} - \eta(k)$  and rearranging, we find the *inverse* reputation function:

$$k = \frac{2\eta(k)^3 - \eta(k)^2 - 2\eta(k)}{2(\eta(k) - 1)} \quad (2.10)$$

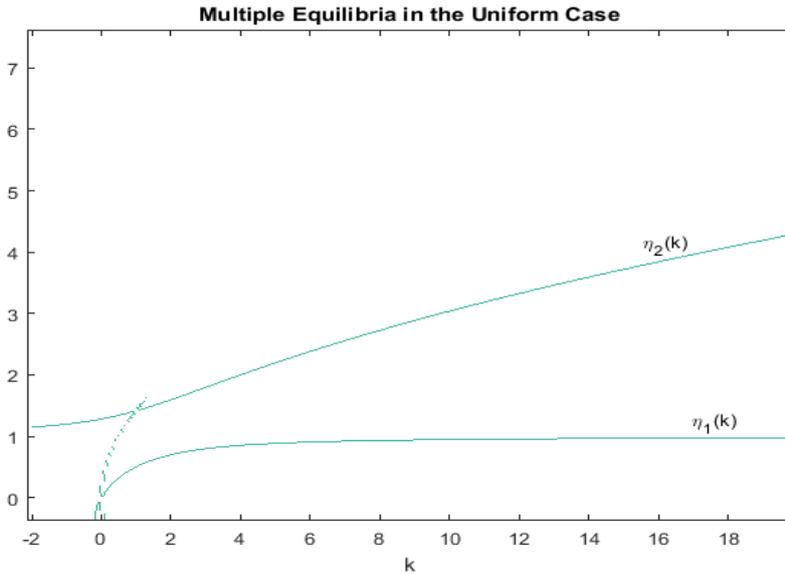


Figure 2.2: Reputation as a Function of Political Benefits

Figure 2 depicts the above relation. We refer to  $\eta(k)$  as the *signal extraction curve* or SEC. It simply illustrates, for every value of  $k$ , the Bayesian equilibrium rule  $\eta(k)$  that determines the threshold values for both prosocial valuation and political greed above which firms engage in CSR. For a large set of parameter values the reputation game has two equilibria<sup>12</sup>. We assume that, whenever multiple equilibria exist, the one with higher participation - i.e. lower  $\eta(k)$  - prevails. That is, we only consider the equilibrium defined by  $\eta_1(k)$  in Figure 2. The idea of corruption becoming a social norm is illustrated by the concavity of the SEC curves<sup>13</sup> implying that reputation worsens at a decreasing rate as political benefits offered to CSR firms increase. It should be noted that, for the considered equilibrium,  $\eta(k)$  approaches 1 as  $k \rightarrow \infty$ .

### The Elite's Choice

Now we return to the first stage of the game. Let  $(x_E, y_E)$  denote the type of the lottery winner. Firm E chooses, not only whether or not to engage in CSR  $s_E \in \{0, 1\}$ , but also the amount of political benefits over a continuous choice set  $K \subset \mathbb{R}^+$  at a cost  $C(k) = \theta k$ . The marginal cost of increasing the political privileges conveyed to businessmen  $\theta \in [0; 1]$  is assumed to be higher in economies where the state is less prone to capture. This parameter is crucial for the analysis as it can alter the outcome of the game as we will see. The Elite thus tries to maximize its profits given by:

$$\max_{s,k} \pi = (x_E + ky_E)s + [E(x|s, k) - E(y|s, k)] - \frac{1}{2}s - \theta k \quad (2.11)$$

Firm  $E$  can either choose to exert CSR and set the optimal level of  $k_1$  that least stains the image of firms exerting CSR while maximizing its payoffs from participation or abstain from CSR activities and choose  $k$  that enhances the image of abstaining firms. That is, the Elite chooses between two bundles  $(s = 1, k_1)$  and  $(s = 0, k_0)$  where

$$k_1 = \operatorname{argmax}_{k \in K} [\pi_1 = (x_E + ky_E) + \Delta_1(k) - \frac{1}{2} - \theta k]$$

and

$$k_0 = \operatorname{argmax}_{k \in K} [\pi_0 = \Delta_0(k) - \theta k]$$

While a closed form expression for  $k_1$  and  $k_0$  as a function of the parameters cannot be

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<sup>12</sup>whether those equilibria imply a positive or zero-participation depends on the maximal value  $V$  that  $\eta$  can take.

<sup>13</sup>which is more pronounced for  $\eta_1(k)$  but only appears for larger values of  $\eta_2(k)$ .

derived, their values can easily be computed numerically for different values of the elite's political greed  $y_E$  and the cost of influencing public policy<sup>14</sup>,  $\theta$ . We first discuss the choice of  $k$  in each bundle then derive conditions, through simulations, for the Elite to choose one bundle over the other.

**Lemma 13.** *While a low cost of influencing public policy,  $\theta$ , tempts even the least opportunistic of Elites to increase the political benefits,  $k_1$  at the cost of a negative reputational return on their CSR activities, a high cost disciplines even the greediest of types.*

Should the lottery winner decide to engage in CSR, he sets a level of political benefits to be conveyed to firms engaging in such practices,  $k_1$ , that increases in both his political opportunism (the marginal direct benefit from  $k$ ) and the degree of vulnerability of the state towards capture (a lower marginal cost,  $\theta$ ) as shown in Table 1<sup>15</sup>.

$y_E$	0	0.01	0.02	0.05	0.4	0.5	0.6	0.9	0.95	1
$\theta = 0.01$	0.2471	0.2834	$\infty$							
$\theta = 0.02$	0.2187	0.2481	0.2834	$\infty$						
$\theta = 0.6$	0	0	0	0	0.0258	0.1033	0.2834	$\infty$	$\infty$	$\infty$
$\theta = 1$	0	0	0	0	0	0	0	0.0948	0.1720	0.2834

Table 2.1: Choice of  $k_1$ , the Political Multiplier in the Participation Bundle, for Different Values of the Elite's Opportunism,  $y_E$ , and the Cost of influencing Public Policy,  $\theta$

The results in the table imply that, in economies that are highly prone to capture, all but the politically disinterested business politicians set substantially large values for the political multiplier should they engage in CSR. For instance, for  $\theta = 0.01$ , all business politicians or lobbies with  $y_E \geq 0.02$  set  $k_1 \rightarrow \infty$ . In that case, the Elite chooses to forgo the reputational return on CSR - as can be seen from Figure 3<sup>16</sup>,  $\Delta_1(k)$  is then negative - and prefers to reap the direct political benefits.

On the other hand, the economy being immune to capture - i.e. for large values of  $\theta$  - makes the business politicians less free-handed in doing so. Only the greediest can set a

<sup>14</sup>Rewriting all expressions in terms of  $\eta(k)$  using equation (10), and maximizing  $\pi_1(k)$  and  $\pi_0(k)$  with respect to  $\eta(k)$ , we obtain the following first-order conditions for  $\eta(k_1)$  and  $\eta(k_0)$  denoted  $z_1$  and  $z_0$  respectively:

$$16az_1^9 + z_1^8(36 - 44a) - z_1^7(24a - 164) + z_1^6(153a + 233) + z_1^5(4 - 50a) - z_1^4(164a + 303) + z_1^3(84a + 238) + z_1^2(76az^2 + 4) - z_1(32a + 68) + (20 - 16a) = 0$$

and

$$48\theta z_0^8 + 4z_0^7(2 - 33\theta) + 24z_0^6(\theta - 1) + z_0^5(195\theta - 14) + 2z_0^4(58 - 51\theta) - 2z_0^3(51\theta + 65) + 24z_0^2(2\theta + 1) + 12z_0(2\theta + 3) - 16 \quad (2.12)$$

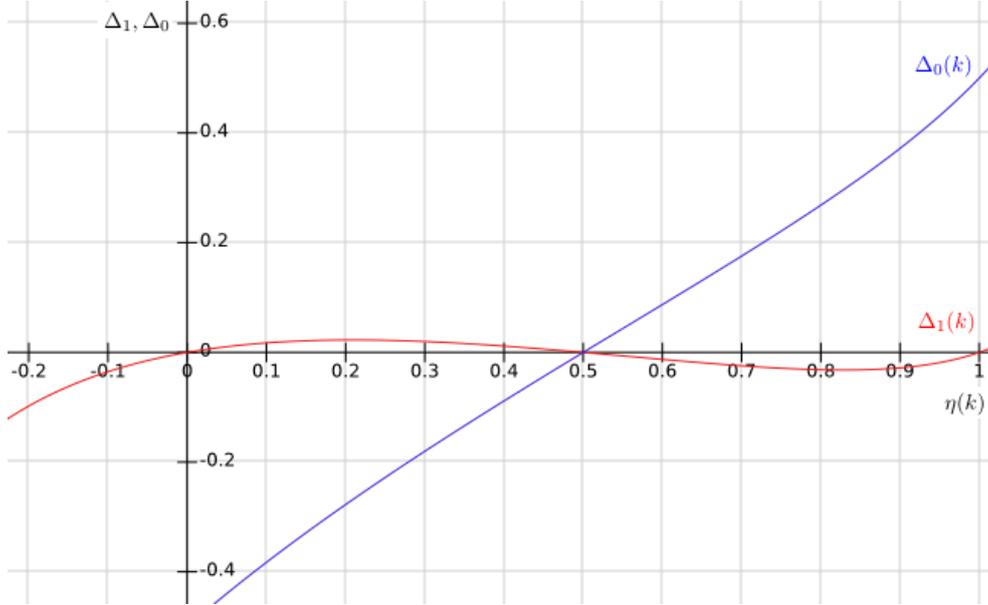


Figure 2.3: Reputation of the Participating vs. the Abstaining Firms as a Function of the Cutoff Equilibrium Rule  $\eta(k)$

For  $\eta < c$ , while  $\Delta_0(k)$  takes on negative values,  $\Delta_1(k)$  is positive; firms that do not exert CSR are seen as the bad types with low prosocial motivation whereas larger political benefits do not stain the reputation of participating firms as firms whose prosocial orientation alone does not cover the cost of CSR ( $x < c$ ) would need such benefits to allow them to participate. So even if some firms make use of the existing political benefits, such behavior is, in a way, justified. For  $\eta > c$ ,  $\Delta_0(k)$  is positive while  $\Delta_1(k)$  is negative; only the highly public-spirited of firms would abstain from CSR activities even though they become attached to considerably large political benefits. Participation, on the other hand, ought to be translated as an act of greed; firms that need those large amounts of political benefits to cover the costs of CSR must have a very low prosocial orientation, and those who participate in order to exploit those large benefits are of the opportunistic type. For relatively large values of the political multiplier however, precisely for  $k > 3.5238$ , both the non-reputational payoffs and the pre-existing reputation effects dominate. On the one hand, firms get large payoffs from engaging in CSR so participation would be the decision of any rational profit-maximizing firm. On the other, the pool of firms practicing CSR at such large values of  $k$  already contains the most opportunistic types, so new entrants can hardly stain the participating firms' reputation further. For sufficiently large values of  $k$  (as  $\eta(k)$  approaches 1), participating firms do not incur any reputational loss.

non-null value for the political multiplier, which will also be quite low. That is, for  $\theta = 1$ , a firm with  $y_E \leq 0.6$  would set  $k_1 = 0$ . Even if the firm is sufficiently greedy ( $y_E \geq 0.9$ ), it sets relatively low values for the political multiplier,  $k_1 \leq 0.2834$ . In this scenario, increasing political benefits that come along with business is too costly, the best an elite can do then is to enhance his image as a firm engaging in CSR. In Figure 3, this amounts to setting the political benefits at a level  $k_1$  such that the corresponding  $\eta(k_1) \in [0; 0.5[$  to get a positive reputational return. That is, the Elite rather chooses to reap a positive reputational return on his CSR investments. Now we turn to the choice of an Elite who abstains from CSR activities.

**Lemma 14.** *An Elite who abstains from CSR activities sets the highest possible value for the political multiplier,  $k_0$ , which decreases in the cost of influencing public policy,  $\theta$ .*

It can be readily seen from Figure 3 that, should the Elite choose to abstain from CSR activities, he would set  $k_0 > 1$  ( $\eta > 0.5$ ) because, only then, can he earn positive payoffs. In other words, the lottery winner ought to set a high level of political benefits alongside CSR activities, should he choose not to engage in such activities and hence not to directly benefit from those political rewards, only to render abstention from CSR an act of Elite and thus enhance his reputation as an abstaining firm. Table 2 shows, for different values of  $\theta$ , the optimal political multiplier that would be set by the lottery winner,  $k_0$ , and the resulting payoffs,  $\pi_0$ . The interesting result is that, *only when the cost of influencing public policy is sufficiently low,  $\theta \leq 0.09$ , will the abstention bundle yield positive payoffs for the business politician.* For  $0.01 \leq \theta \leq 0.09$ , the Elite who chooses to abstain from CSR activities optimally sets the political multiplier of the economy at  $k_0$  which is always greater than 1. This yields a relatively high participation threshold,  $\eta(k_0)$ , that ranges from 0.9498 to 0.7575: abstention is then a heroic act that only the highly benevolent firms do. In other words, only in economies that are highly prone to capture is it worthwhile for a firm or lobby that does not exert CSR to influence public policy.

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with  $a = y_E - \theta$ . Conditions for the resulting values to be maximal points will be given in the text.

<sup>15</sup>where the value of  $k_1$  increases as we move to the right and upwards in the table.

<sup>16</sup>which contrasts the evolution of the reputation of the abstaining firms,  $\Delta_0(k)$ , and that of the participating ones,  $\Delta_1(k)$ , as the threshold value  $\eta(k)$  increases - which simply reflects increases in the political benefits,  $k$ .

$\theta$	0.01	0.02	0.05	0.09	0.1
$k_0$	10.8372	6.22286	3.8785	2.5144	2.2462
$\pi_0$	0.3228	0.2566	0.1199	0.0054	-0.0222

Table 2.2: Choice of  $k_0$ , the Political Multiplier in the Abstention Bundle, for Different Values of the Cost of influencing Public Policy,  $\theta$

Finally, it should be noted that the Elite would choose abstention over participation in CSR when the cost of influencing public policy is negligible and when his moral<sup>17</sup> and/or political motivation are considerably low. Otherwise, if  $\theta > 0.1$ , it is too costly for the Elite to set the political multiplier at a level that enhances his image as an abstaining firm on the CSR market and if  $x_E$  and/or  $y_E$  is large, he is better off engaging in CSR and reaping its direct benefits<sup>18</sup>. Hence, only in economies where the state is quite prone to capture, and only when the Elite is politically disinterested and/or not so prosocial will he choose to set  $k_0$  and abstain from CSR activities. However, this is no good news for the economy, because then the political multiplier that would be set is quite large.

### 2.3.2 Discussion: Business Politicians

The main conclusion to be drawn from the above analysis is that *reputation is an effective disciplining tool only in economies that are immune to capture* (with high levels of  $\theta$ ): only the greediest of business politicians find it profitable to set a positive amount of political benefits alongside CSR *and* at a level that is relatively low. The threshold for corruption becoming a social norm and hence for the reputational channel to cease to discipline the opportunistic businessmen is not attained. The problem with economies that are prone to capture is that business politicians are tempted to increase the political multiplier indefinitely as it allows them to reap large direct benefits without having to incur an important reputational loss on the CSR market since they drag the bad types into CSR activities so abuse of CSR for political ends ought to be the norm. The elite would be thus free-handed to serve its private benefits, which is clearly bad news for economies with a high degree of state capture.

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<sup>17</sup>The Elite's prosocial preferences,  $x_E$ , even though they have no effect on the elite's optimal choice of  $k_1$ , have a level effect on his payoffs and hence will affect the arbitrage between the participation and abstention bundles.

<sup>18</sup>In the foregoing discussion, we assume that the elite's prosocial motivation  $x_E$  is sufficiently large to allow for positive payoffs from the participation bundle; otherwise the trade off between the two bundles for  $\theta \geq 0.1$  would amount to choosing the one with the smallest negative payoffs.

**State Capture and the Public Good** Now we take a closer look at the question of influencing public policy. So far we have assumed that the Elite tries to direct public policy in a way that serves his interests to obtain large political benefits. One interpretation in the CSR context would be that the Elite tries to reduce the public good<sup>19</sup> provided through the government. The link is simple: by reducing the government provision of the public good, and assuming the CSR investments of firms come to substitute for that particular public good, firms engaging in CSR would get a more lenient regulation, access to political networks,.. In the case of a business politician, this would make his CSR contributions more valuable and hence his chances of getting elected increase. For instance, think of a developing economy with high illiteracy rates -i.e. the supply of the public good *education* is scarce - a firm exerting efforts to eradicate illiteracy substitutes for the government provision and gains more political power since its intervention in this area is, in a way, indispensable, and the more illiteracy there is the more valuable firm's intervention is and hence the less costly it is to gain political benefits. Assuming the Elite can influence the public good provision through the government, it is not surprising that only large values of the political multiplier would emerge. This is the scenario encountered in economies ruled by an *elite* that cumulates both economic and political powers. In countries where businessmen are not allowed to hold political status, this reflects the case where a business lobby has substantial influence on the policy-making through bribes or any other mechanism.

This extension of the model explains real life configurations where the elite can increase its CSR investments and the political benefits that come along without staining its reputation on the economic market. Factors such as the degree of development or corruption in the economy, the actual system of regulation, the financial or human resources invested in lobbying, the number of businessmen that occupy political positions and the degree of concentration of political and economic powers, which affect the cost of influencing public policy, can impede or facilitate the emergence of this phenomenon. For instance, in the Egyptian economy prior to the revolution, the reputational mechanism would have been the following: the business tycoons that were at the same time the most prominent politicians had substantial influence and were able to reduce the public good provided through the government, thus increasing the political returns that came along CSR investments

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<sup>19</sup>By public good we mean electricity, water, transportation (roads, railways, buses, ports, airports,..), which are referred to as *economic infrastructure* but also the so-called *social infrastructures* such as education and health and the even more *luxurious* forms public good such as air quality and protection of the environment.

as those investments were precisely targetting the areas where the government failed to deliver. Their reputation on the political market was not glittering, they were seen as incompetent politicians who failed to provide the basic public goods (and this was not easy to see due to transparency problems and strong restrictions on the media). However, to the vast majority of the people, they were public-spirited businessmen with goodwill. This is because, due to the substantial political benefits that came along CSR, most of the companies investing in CSR were already of the highly opportunistic type, that it became the *norm* in a way. So as further political benefits were offered to businessmen, people stopped discounting for the political greed part of the businessmen's motivations, thus explaining why their reputation as businessmen was not stained.

Having assessed the impact of introducing politics into the sphere of CSR, we now restrict our attention to the heterogeneity in the benevolence of firms to study factors, other than the political one, behind CSR activities being differently viewed from one economy to another. The focus in the next variant of the model will be the *distributional factor* which helps explain why in some economies firms engaging in CSR enjoy large reputational returns, whereas in others such activities are not rewarded.

### 2.3.3 The One-Dimensional Uncertainty Model

Here we consider firms to be heterogenous only in one dimension, that is, their corporate culture. Once the political aspect is taken out of the reputation game, different configurations for the CSR participation game may emerge from the mere distribution of firms' types.

**Distribution of types and Equilibrium Cutoff** Consider the benchmark model in section (3). For this part of the analysis, we return to the general form distribution of types. Let  $y_i = 1 \forall i$ . Intrinsic valuations in the economy  $x_i$  follow a cumulative (general form) distribution  $F(x)$  and a density  $f(x)$  on  $[0, V]$ .  $F$  and  $f$  are common knowledge, but each firm privately observes the realization of its type. In addition to firm's intrinsic gain from CSR, a firm may value CSR because it allows it to reap some material benefits  $k$ , that all firms value  $k$  equivalently. Again, a firm only faces a binary participation choice  $s_i \in \{0, 1\}$ . Participation entails a cost  $C(s) = cs$ . Firm's reputation (demand) is now

represented by the expected value of its moral drive  $E(x|s)$ . Its payoff is now given by:

$$\pi(x_i, s) = \begin{cases} x_i + k + E(x|s = 1) - c, \\ E(x|s = 0), \end{cases} \quad (2.13)$$

The incentive constraint of the firm is simply to engage in CSR whenever:

$$x_i \geq c - k - \Delta(x) \quad (2.14)$$

with  $\Delta(x) = E(x|s = 1) - E(x|s = 0)$ . Consequently, all the Bayesian equilibria of the game have a cutoff structure: firm  $i$  engages in CSR if its type  $x_i$  is equal to or above a certain threshold value  $\tilde{x}$ . Given a Bayesian update of beliefs,  $\tilde{x}$  solves:

$$\tilde{x} = c - k - \Delta(\tilde{x}) \quad (2.15)$$

where

$$\Delta(\tilde{x}) = \mu^+(\tilde{x}) - \mu^-(\tilde{x})$$

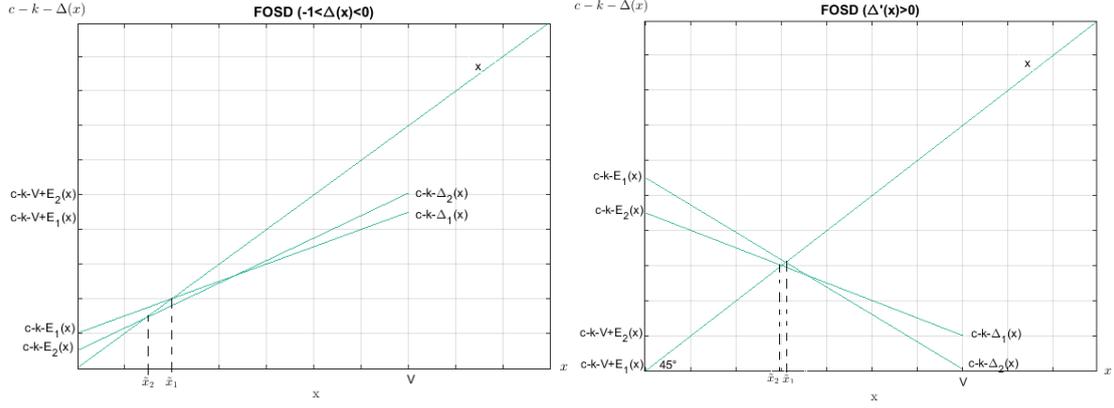
with  $\mu^+(x)$  and  $\mu^-(x)$  denoting the conditional means in the upper and lower tails of the distribution and thus defining the *honor* from participation and the *stigma* from abstention respectively. In the two-dimensional uncertainty model presented earlier, honor referred to the part of firm's motives that can be imputed to its public spiritedness and stigma to that related to political greed; and hence there were honor and stigma from both abstention and participation. In the present refinement of the model, participation has only positive connotations, whereas abstention means that the firm belongs to the group with *lower* prosocial orientation. Now the question is: *how will the prior beliefs about  $x$  affect the equilibrium threshold? And how will the latter define how consumers view firms engaging in CSR?*

Figure 4 illustrates the equilibrium condition given by (15) for both the scenarios where reputation increases or decreases in the threshold value (that is for  $\Delta \leq 0$ )<sup>20</sup>. A simple comparative statics exercise yields the following result:

**Lemma 15.** *In the case of a unique equilibrium, overall participation increases as the average public-spiritedness of firms increases.*

Consider two economies 1 and 2, characterized by two CDFs for the distribution of firms' prosocial orientations,  $F_1(x)$  and  $F_2(x)$ . If  $F_1$  is first-order stochastic dominant over

<sup>20</sup>and assuming this rate of increase or decrease is constant ( $\Delta'(x)$  is independent of  $x$ )



(a) FOSD shifts when CSR is driven by Stigma Avoidance

(b) FOSD shifts when CSR is driven by Pursuit of Honor

Figure 2.4: Representation of Equilibrium and FOSD shifts: As the mean increases from  $E_1(x)$  to  $E_2(x)$ , the participation threshold falls from  $\tilde{x}_1$  to  $\tilde{x}_2$

$F_2$ , that is  $F_1(x) < F_2(x)$  for all  $x \in [0; V]$ , this implies that  $E_1(x) > E_2(x)$ . As can be seen from Figure 4, whether reputation increases or decreases in the threshold value (that is  $\Delta \leq 0$ ), a higher average prosocial orientation implies a larger overall participation ( $\tilde{x}_2 < \tilde{x}_1$ ). This result is consistent with the findings of Bénabou and Tirole (2006). In what follows, we present the authors' interpretation of the *distribution mechanism* and then use the main insights to illustrate how this mechanism can help explain the difference in CSR configurations as well as the reputation of CSR firms in Europe versus the United States.

**The Bénabou and Tirole (2006) Analysis** The authors study the mechanism that leads to a particular threshold equilibrium. To summarize, it is the form of the distribution  $f(x)$  that induces either a complementarity or substitution mechanism among firms' decisions to engage in CSR, which ultimately leads to the endogenous CSR standards, specific to each economy. A key variable in the analysis is

$$\frac{d\Delta(x)}{dx} = \frac{d\mu^+(\tilde{x})}{dx} - \frac{d\mu^-(\tilde{x})}{dx}$$

namely whether it is honor or stigma that is more responsive to participation levels. They distinguish between two scenarios. First, the case where *prosocial behavior - or CSR activities in our setup - is a common practice*. When  $\Delta'(x) < 0$ , as overall participation increases ( $x$  falls), honor from engaging in CSR activities fades faster than stigma from abstention increases. This occurs when the distribution of  $x$  has a density that is increasing

(Jewitt, 2004)<sup>21</sup>. The mechanism behind is simple: each firm that engages in CSR reduces the honor from CSR - as it becomes a common practice - but enhances the shame from abstention since only the bad types abstain. Since  $f(x)$  is increasing, the reputational loss that comes along abstention is so strong that the marginal firm that preferred to stay out now is obliged to participate, and drags the neighbouring ones and so on. Hence, there exists *strategic complementarity* between firms' decisions to engage in CSR. In this case, multiple equilibrium thresholds may obtain. Precisely, when  $\Delta'(v) < -1$ , complementarity is so strong that each company that engages in CSR drags the other by the same mechanism described above, this effect is always in motion so any interior equilibrium is unstable: the threshold types are indifferent between participation and abstention and the slightest 'tremble' in the threshold level will cause the equilibrium to unravel. This leads to corner solutions with full participation as the only stable equilibria.

However, when  $-1 \leq \Delta'(x) \leq 0$ , complementarity is weak enough that a unique stable interior equilibrium may obtain: for a given threshold, the marginal firm may still prefer to stay out. This last condition is satisfied when  $x$  is, not only increasing, but also when it does not increase too fast. The intuition behind this result is that, having a density that is smoothly increasing makes it less likely to have a rupture of the strategic complementarity at one type  $\tilde{x}$ . Otherwise, this particular  $\tilde{x}$ , the interplay between honor and stigma will change (magnitude of stigma relative to the fading honor will weaken) and then the firms with  $x < \tilde{x}$  will not have to comply either by the same mechanism<sup>22</sup>.

Second, the case where *prosocial behavior - CSR - is seen as a heroic act* is considered. In contrast to the previous scenario, firms' decisions may be strategic substitutes. This occurs when the distribution of  $x$  has a density that is decreasing, and thus  $\Delta'(x) > 0$ . As fewer firms participate ( $x$  increases), the *niche* firms that engage in CSR are very positively viewed. Furthermore, they create a positive externality for the non-participating firms as the stigma from abstention fades. CSR is just not a common practice so abstention ought to be the norm. Consequently, equilibrium payoffs of all firms increase with this belief, whether they engage in CSR or not. This is identical to the *free-riding effect* discussed in Fleckinger et al. (2015). Firms' decisions to engage in CSR are then strategic substitutes.

This effect yields a dynamic adjustment that is not smooth: a downward deviation

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<sup>21</sup>Mathematically, if the density  $f(x)$  is increasing, an increase in  $x$  will more likely increase the conditional mean in the lower tail more than that in the upper tail since the weight reallocated at the margin is relatively larger in the lower tail.

<sup>22</sup>Bénabou and Tirole (2006) find that a sufficient - but not necessary - condition for this is that  $f(x)$  be log concave.

from a certain cutoff equilibrium  $x$  increases stigma more than it decreases honor, while an upward deviation dulls stigma. So while the first leads to an equilibrium with more participation, the other gives rise to an equilibrium with less participation. This kind of adjustment completely differs from the complementarity case where stigma always increases in participation and the *one company drags the other* effect was always in motion for both upward and downward deviations. Hence, interior equilibria of the game here are unique and stable. There is a unique equilibrium with participation increasing in  $k$ .

These basic insights suggest that if the average firm in the economy is public-spirited, the other firms have to *conform* to the mainstream. Whereas when firms on the average are not prosocial, there is no rule of conformity and hence the Bayesian expectation of the goodwill of firms exerting CSR will be quite large. A notion that inevitably appears is that of *CSR standards* that emerge endogenously from the specific characteristics of firms' distribution in the economy.

### 2.3.4 Discussion: All on Board or Restricted Access?

In sum, when we have a few bad apples in the economy with low prosocial orientation, complementarity between firms' choices occur. More and more firms engage in CSR thus spoiling the image of the *irresponsible* firms. The latter then find themselves compelled to practice CSR to avoid stigma and this further increases participation and confines abstention to an even worse pool and so on, this is the *all on board* scenario. Whereas, in the presence of a distinguished elite with high valuation for CSR, abstention is not negatively viewed and the main reputational concern is the pursuit of honor. Equilibria with partial participation may obtain in both cases, however in the complementarity case it is only stable when complementarity is weak, that is, when there is a large variety of firms' types. This last result is perhaps closer to real-world situation if one feels that the full participation scenario is too much of a theoretical or ideal example.

**CSR in Europe vs. the U.S.** We now exploit the results obtained from the model to explain why CSR is viewed differently, even among developed countries. Consider how CSR practices are viewed in Europe versus in the U.S. While in most European countries firms that do not engage in CSR are so negatively viewed that they constantly face boycotts and protests from consumers and NGOs (Doh and Guay, 2006), in the U.S. CSR activities are carried out by a few large companies that are highly reputable (Maignan and Ferrell, 2003). The CEO and the chairman tend to play a major role in the public view of the

company in the U.S. and those *leaders* are known for the largest CSR projects in their country. To see this, think of the big American corporations; Bill Gates is Microsoft, Steve Jobs was Apple, Howard Schultz is Starbucks. Whereas European firms typically consist of a small number of large investors that usually do not have resounding names.

CSR reporting is more important in Europe than in the United States. US companies have been slow to implement the internationally accepted accountability standards. For instance, of the 3490 facilities certified by SA8000<sup>23</sup> only 2 (0.06%) are from the US, compared with 1447 (41%) from the EU, 1081 of which are from Italy, 40 from Spain and 12 from the UK (SA8000 Certified Facilities, 2015). Of the 18,000 company reports prepared the Global Reporting Initiative (GRI) guidelines<sup>24</sup> only 10 % are from the US, compared to 45 % from Europe, and once reporting is calculated as a function of GDP, Sweden comes out on top whereas the USA drops down to the bottom (GRI Sustainability Reporting Statistics, 2010). Finally, of the 223,149 companies that follow the ISO 14001 reporting standard<sup>25</sup>, 5,225 (2.3 %) are American companies and 89,237 (40%) are European, precisely, 16,527 are Spanish, 14,542 Italian and 10,912 British (ISO Survey of Certifications, 2009). This provides some evidence that corporate environmental and social responsibility is taken more seriously by EU companies, or equivalently indicates a *higher participation* in CSR among European firms.

We argue that these differences are, at least partly, due to differences in the distributions of firms' types in each economy. Most European firms have CSR embedded in their culture, either for historical, cultural or religious reasons (Berthoin Antal and Sobczack, 2007). While U.S. companies would tend to communicate about and justify CSR using economic or bottom-line terms and arguments, European companies would rely more heavily on language or theories of citizenship, corporate accountability, or moral commitment (Hartman et al., 2007). Participation in CSR is widespread as can be seen from the scope of the company philanthropic activities through the *Mécénat* in France that benefits from sponsoring of 159 000 companies, 19% of which are small to medium enterprises (Admical report, 2014), suggesting that large prosocial orientation ought to be the norm and further emphasizing the strategic complementarity mechanism. Whereas in the American context,

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<sup>23</sup>A reporting standard developed by the Council on Economic Priorities Accreditation Agency. It assesses performance on issues such as child labour, forced labour, health and safety, free association and collective bargaining, discrimination, disciplinary practices, working hours and compensation.

<sup>24</sup>Developed by the United Nations, the GRI aims to standardize sustainability reporting procedures. It was conceived in 1997 by the Coalition for Environmentally Responsible Economies (CERES), a group that encourages companies to adopt environmental practices.

<sup>25</sup>Which maps out a framework that a company can follow to set up an effective environmental management system and provides certification.

where no strong traditions for corporate responsibility were developed, the honor of engaging in CSR is large, since only the highly prosocial firms participate. The abstainers in this case are not so badly judged since CSR here is an act of elite and is just not a common practice.

**CSR and (de)-regulation** The distribution of firms' types alone clearly is not enough to explain the wide array of the different CSR standards. Other factors are into play and are taken into account by the observer when he updates his beliefs in the inference making process. Two of these factors pertain to the degree of regulation: CSR practices being mandated by the government and CSR activities filling the gaps left out by the government in self-regulated economies.

The problem for observers is that it is not an easy task to tell whether CSR undertaken by the firm is pure altruism (i.e. embedded in firm's culture) or it is related to a governmental regulation. To account for this situation in the model, assume that with probability  $p \in [0, 1]$  the firm was forced to engage in this specific CSR practice or that it received a more lenient legislation in exchange. The stigma from abstention is unchanged  $\mu^-(x)$ . The honor conveyed by CSR however becomes:

$$\mu^+(x; p) = \frac{p\bar{x} + (1-p)[1 - F(x)]\mu^+(x)}{p + (1-p)[1 - F(x)]} \quad (2.16)$$

which is smaller than  $\mu^+(x)$ . In a complementarity scenario, the presence of governmental regulation mandating some CSR practices strengthens the complementarity effect. Considering that this effect is in action in European countries rather than in the U.S. seems like a plausible assumption. Consider first the case of CSR practices that are mandated by the government. The issue of Genetically Manipulated Organisms (GMOs) provides a unique example of the differences between Europe and the U.S. CSR practices. Europe keeps a tighter rein on GMOs present in food sold. Whereas in the U.S, the FDA loosely monitors GMOs; therefore, food companies must stand and take notice of any GMOs its suppliers might use. Another example is that of carbon emissions: U.S. automakers discuss initiatives to reduce carbon emissions in their CSR reporting, while in Europe, emissions are regulated thus removing the necessity to assume an independent role. Other than the distribution of types, strict regulation by European governments is a key variable in explaining why the view of CSR differs from the American context.

The second interesting factor to consider is the market being rather de-regulated and hence CSR activities that fill in the gap left by the government benefit from more visibility.

Translated into our set up, this amounts to attributing a larger weight to the honor from engaging in CSR and pushing forward the idea that it is a heroic act, which in turn enhances the substitution mechanism. This factor explains, not only the level of participation in the economy, but also the nature of CSR activities being undertaken in each. For instance, CSR in the United States includes the issue of healthcare insurance for employees. However healthcare insurance is not an issue for a European company due to national healthcare plans. While education represents a large explicit CSR area for many U.S. companies, the funding at the governmental level in European countries makes such activities unnecessary (see Danko et al., 2008).

## 2.4 Conclusion

This paper has highlighted the departures from the traditional view of CSR as a practice that targets the needs of the society. We rather argue that the motives behind CSR are mostly reputational, and sometimes firm's reputational interests coincide with society's needs. Based on the mere reputation mechanism, we analyze the impact of offering firms larger political benefits alongside CSR activities. Introducing politics into the sphere of business has ambiguous effects: as more political favors are granted, the most public-spirited firms are deterred by the political stigma attached to CSR and abstain from such activities, new entrants are less opportunistic than the existing pool of participants, some companies should have entered into CSR but do not. The impact of introducing politics into the sphere of CSR depends on the *amount* of political benefits conveyed to firms, which could be seen as a measure of how business and politics are mixed up in this particular economy.

Two main conclusions are derived from the analysis: that of clean economies and corruption as a social norm. The first states that, in economies where firms are not politically rewarded for their CSR activities, a marginal increase in political benefits stains CSR practices and deters companies from engaging into it. The second suggests that, for any given distributions of types, the image-spoiling effect of politics fades away as larger political benefits are offered as a reward to CSR firms. For some distributions, there exists a certain level of political favors above which corruption becomes a social norm, in the sense that companies drawing political returns on their CSR investments does not make consumers appreciate their CSR efforts any less. This is perhaps the novel finding: reputation is both a *relative* and *contextual* phenomenon, in the sense that the reputation of the new entrants should be assessed given both the direct non-reputational benefits of firms and the existing pool of firms exerting CSR. This is the intuition behind the corruption as a social norm proposition: as the political benefits increase, the bad types are drawn in first, and for sufficiently large political favors, one can be certain that the most opportunistic types are already in, so the new entrants do not incur any reputational loss by engaging in CSR because, in a way, the definition of an opportunistic firm is endogenously determined.

Because our ultimate goal was to analyze the case of business politicians, namely, how a player would set his own rules of the game, we developed a variant of the model where firms' types along both dimensions follow a uniform distribution and one particular firm called the *Elite* decides on both the extent of political benefits that come along CSR and

whether or not to engage in CSR activities. The key finding is that, in highly corrupt economies where the state is most prone to capture - or equivalently where the basic public goods are underprovided - business politicians can actually exploit their political influence to forge the public view of an *opportunistic* firm to their own benefit: they introduce a large amount of political benefits into the CSR sphere so that opportunism becomes the norm, thus reversing the image-spoiling effect of politics while reaping large payoffs.

Having analyzed how CSR is viewed in the case of Elite capture or business politicians, a variant of the model - where firms vary *only* in their public spiritedness - is used to illustrate how CSR is viewed regardless of the political context. A high average prosocial orientation enhances the complementarity mechanism thus leading to a configuration where the majority of firms engages in CSR: this is perhaps the European scenario. Practicing CSR becomes the norm, abstaining firms constantly face boycotts and protests. In contrast, in an economy where firms on average are not quite prosocial, the participation game is likely to be governed by a substitution mechanism: only a few firms practice CSR and are then highly reputable. This is closer to the American configuration of CSR.

A number of caveats however should be borne in mind. First, it is not clear when corruption coincides with, or differs from, influence over policies, which is considered lobbying and is considered a political strategy in high income nations. If the rules are broken or bent *à la carte*, one would be inclined to think it is corruption, if the rules change for all, it could be lobbying. However, the same practices can qualify as lobbying in one context and corruption in the other. Second, more empirical work is needed to more precisely describe the different features of CSR that are relevant for particular economies. Such work would naturally lead to distinguishing different sets of CSR motives requiring differentiated policies if one aims at creating win-win situations for companies and the societies in which they operate. Third, even though we have mentioned some characteristics of government, a broader political economy framework, taking into account specific historical and political situations is necessary.

The analysis provided here highlights the importance of theorists and empirical researchers introducing political aspects, but also distributional factors, into the analysis of CSR. An interesting research avenue would be to mobilize the notions of honor and stigma presented here to better understand the CSR activities of *sin industries* such as tobacco, gambling, firearm industries that deviate from broadly-endorsed standards.

## 2.5 Appendix

### Proof of Lemma 2.1

*Proof.* Since  $k$  here is a fixed parameter, in what follows we will temporarily omit from the notation the dependence of all functions on this argument. Referring to figure 1a,  $E(x|s = 1)$  is calculated as a weighted average of the expected values in  $D + E, C$  and  $B$  respectively:

$$E(x|s = 1) = \frac{[1 - F(\tilde{x})] \times \mu^+(\tilde{x}) + F(\tilde{x})[1 - G(\tilde{y})] \times \mu^-(\tilde{x}) + [F(\tilde{x})G(\tilde{y}) - I^A] \times \mu^-(\tilde{x})}{1 - I^A}$$

where  $\mu^+(x)$  and  $\mu^-(x)$  denote, respectively, the conditional means in the upper and lower tails of the distribution of  $x$  and similarly for  $y$  and  $I^A$  the weight allocated to the abstaining firms in the joint distribution of  $x$  and  $y$ . Since  $[\bar{x} = 1 - F(\tilde{x})] \times \mu^+(\tilde{x}) + F(\tilde{x})\mu^-(\tilde{x})$ , we obtain that

$$E(x|s = 1) = \frac{\bar{x} - I^A\mu^-(\tilde{x})}{1 - I^A}$$

The expected value for the abstaining firms  $E(x|s = 0)$  is computed as a conditional mean, that is

$$E(x|s = 0) = E(x|x \leq \tilde{x}) \times P(x \leq \tilde{x}|s = 0)$$

this conditional probability being equal to 1,  $E(x|s = 0)$  is simply given by  $\mu^-(\tilde{x})$ . Applying a similar method to  $y$ , we find that, the reputational return on CSR defined by (3) is:

$$\Delta = \frac{(\bar{x} - \bar{y}) - I^A[\mu^-(\tilde{x}) - \mu^-(\tilde{y})]}{1 - I^A} - [\mu^-(\tilde{x}) - \mu^-(\tilde{y})]$$

Which we substitute in the equilibrium condition (2) to find  $\eta(k)$ . □

### Proof of Lemma 2.2

*Proof.* Applying implicit differentiation to equation (5) and using Leibniz integral rule, we find that:

$$\eta'(k) = \frac{(\frac{1}{k^2}I_x - \frac{\eta}{k^2}I_f)u - (1 - I_A)\frac{\eta}{k^2}\frac{d\mu^-(y)}{dy}}{(1 - I_A)^2 + (1 - I_A)[\frac{d\mu^-(x)}{dx} - \frac{1}{k}\frac{d\mu^-(y)}{dy}] - aI_f} \quad (2.17)$$

where  $I_x = \int_0^{\eta(k)} x f(x) g(\frac{\eta(k)-x}{k}) dx$ ,  $I_f = \int_0^{\eta(k)} f(x) g(\frac{\eta(k)-x}{k}) dx$  and  $u = [\bar{x} - \bar{y}] - I^A[\mu^-(\tilde{x}) - \mu^-(\tilde{y})]$ . As  $k \rightarrow 0$ ,  $\tilde{x} \rightarrow \eta(0) \geq 0$  - as can be seen from the one-dimensional uncertainty analysis - and  $\tilde{y} \rightarrow V$ . It is then easy to show that  $\lim_{k \rightarrow 0} u = \bar{x} - \mu^-(\eta(0))$

since  $\mu^-(\tilde{y}) \rightarrow \bar{y}$ , and  $\lim_{k \rightarrow 0} I_A = F(\eta)$ , while  $I_x$  and  $I_f$  tend to either a positive value or zero depending on the distribution  $g(y)$ . Plugging those results in (17), we find the asymptotic term in (17) tends to  $\infty$ .  $\square$

### Proof of Proposition 2.3

*Proof.* Proposition 2.3 follows from the fact that,  $\frac{\eta(k)}{k}$  tends to 0 as  $k$  tends to  $+\infty$  and thus  $I_A \rightarrow 0$ ,  $u \rightarrow (\bar{x} - \bar{y}) - \mu^-(\eta(0))$ . Plugging these values into (17), we find that the dominant term in  $\frac{d\eta(k)}{dk}$  is asymptotically equivalent to  $\frac{0}{1 - \frac{d\mu^-(x)}{dx} - uI_f}$  and thus the result of Proposition 2.3 obtains.  $\square$



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## Chapter 3

# The Domino Effect of Corruption: A Game between the Politician and the Bureaucrat

### Abstract

This paper studies a game between two government agents: a Politician and a Bureaucrat, whose degrees of corruptibility are a priori unknown. Their efforts in a given public project can be either complements or substitutes. The focus is on one feature that is crucial for understanding many political economy problems: the strategic effect of corruption. It is shown that it is easier to bribe a player in a team than it is to bribe a single player, which is bad news for interdependent government agencies. Furthermore, bribery exerts a domino effect on the aggregate team efforts in the case of complementarity, whereas it is less detrimental when efforts are substitutes as it generates offsetting effects. This paper also sheds light on the mechanisms behind a corruptor's choice of the amount of bribes to be offered to each player. The implications for both the design of agencies within the government and the optimal incentives for the various agents in the context of corruption are discussed.

*JEL classification:* D73, D78, H11, M12, M50.

*Keywords:* Bribery, anti-corruption policy, political economy, moral hazard, incentives in teams, complementarity vs. substitutability.

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## 3.1 Introduction

This paper studies the link between corruption and the presence of multiple actors in governmental organization whose efforts are interdependent and hence share political accountability. Intuitively, in the context of multiple actors, having a bad policy outcome does not necessarily prove that a given actor has shirked. Furthermore, it gives him the possibility to blame the other actors for that outcome. Thus, uncertainty and finger pointing reduce the total sum of political accountability. The main question we ask is: how does the possibility of one player accepting bribery affect his decision and those of the other agents in the same organization? Even in the absence of any form of collusion or social norm, the possibility of one player accepting bribery affects all players' incentives to work productively, thus adding a strategic dimension to the decision of the bribe taker.

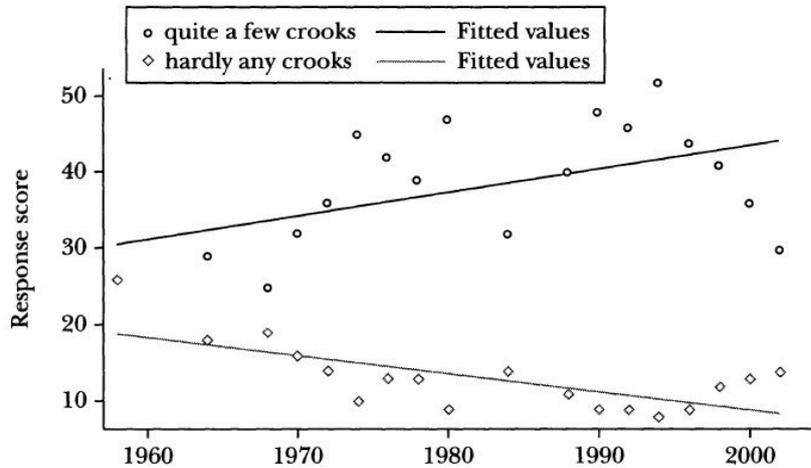
The setup is general enough to be applied to any team where players' efforts are either complements or substitutes. Examples are numerous and range from coworkers in a company, to academics in a university, to broader social questions such as education or skill acquiring in a given neighborhood <sup>1</sup>. Tackling the question in the context of political economy, we focus on the example of governmental corruption throughout the paper to illustrate the basic mechanisms. More precisely, we study corruption in a given governmental institution, which can take place at both the political and bureaucratic level. We show how the first cannot be analyzed in isolation of the second due to the strategic nature of corruption.

A fundamental problem in all political systems is that people in power may extract rents and use their positions to further their own interests to the detriment of the general public. This observation was analyzed by Brennan and Buchanan (1980) who formulated the hypothesis of the "Leviathan Government" that attempts to maximize revenues for its own private agenda. A similar idea lies behind Niskanen's (1971) model of budget-maximizing bureau. Economists have long maintained that, in democracies, electoral competition and information provided by the media may keep such rent extraction at bay. According to the models of electoral accountability, elections discipline the politicians and limit rent extraction by making reappointment conditional on good economic performance (Barro, 1973; Ferejohn, 1986). Media freedom, on the other hand, is seen as the "*Handcuffs*

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<sup>1</sup>For instance, assuming that the quality/cost of education depends on the fraction of the children who are high skill, and thinking of bribery as the children's outside options such as drugs or child labor, the model helps explain at least partly the emergence of "bad" neighborhoods.

### Perception about Crooks in Government, 1958–2000



source: Besley, T., 2005. Political Selection. The Journal of Economic Perspectives, Vol. 19, No. 3, pp. 43-60

Figure 3.1: Perception of Americans towards Politicians

for the *Grabbing Hands*” (Besley, and Prat, 2006). By playing on the reputational concerns of the politician, media freedom helps reduce corruption (Egorov et al., 2009; Reinikka and Svensson, 2005; Kaufman, 2006).

These two effects combined suggest an explanation of the relatively lower levels of corruption in countries with higher levels of democracy, as measured by transparency and political competition; an explanation which may have important implications for the anti-corruption strategies followed by developing countries. There is much that is valuable in this literature. However, there are good reasons to believe that, in a real context, there is an important element missing in the analysis, since even the most *perfect* democracies are prone to corruption as shown in figure 1 which depicts the Americans’ response to a question raised in the US National Election Survey (NES) held since 1962, namely whether they believe that government is run by crooks. The findings do strongly suggest that the public opinion about the honesty of politicians is not so good. Another telling example of the widespread of corruption in democratic countries is that the Corruption Perceptions Indices (CPI) estimated for France and Italy are as low as those estimated for Qatar and Saudi Arabi - 69 and 43 respectively<sup>2</sup>.

<sup>2</sup>provided by Transparency International which ranks countries based on how corrupt their public sector is perceived to be, such that a country’s score indicates the perceived level of public sector corruption on a scale of 0 (highly corrupt) to 100 (very clean); see

We thus depart from the view that corruption stems from a lack of democracy, and rather argue that it is linked to the presence of multiple actors in the public sector with varying degrees of corruptibility which creates an atmosphere of mistrust among government officials - politicians and bureaucrats - and makes each one, individually, more prone to corruption. Transparency and accountability are hence insufficient to hedge against corruption since, in such a context, observers are unable to discern whether it is the bureaucrat or the politician that is corrupted.

## Related Literature

Our paper contributes to the *Self-Enforcing Corruption* or *Epidemic Corruption* literature<sup>3</sup>. According to this view, history of a society or an organization has a prominent role in determining the level of corruption. Lui (1986), Cadot (1987) and Andving and Moene (1990) find that it is harder to audit corruption officials in societies where corruption is more prevalent. Similarly, Sah (1988) finds that interacting with a sufficient number of corrupt individuals in the past makes individual want to continue to be corrupt. Acemoglu (1995) and Murphy et al. (1991) find that, in societies where most individuals accept bribes, the reward to rent-seeking relative to entrepreneurship is high. Behind all this work is the implicit assumption of coordination, side-contracts or even silent agreements among corrupt individuals.

Tirole (1996) studies how subsequent generations can be locked into corruption through the channel of *group reputation*. Intuitively, because of the imperfect observability, the large number of agents who have been corrupt at date 0 raises a general suspicion, and thus the new generations suffer from the original sin of their elders long after the latter are gone. While Tirole asks *why do the agents who arrive with an unsmearred (individual) reputation also necessarily engage in corrupt activities?*, this paper examines *why are the agents who arrive with a relatively unsmearred reputation tempted to accept bribery just because they interact with others who have a smearred one?* We thus formally analyze the *strategic effect* of corruption, even in the absence of social norms, reputation or any form of collusion among agents, using a principal-multiagent framework.

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<http://www.transparency.org/cpi2014/results>

<sup>3</sup>Dixit (2002) uses these expressions to reflect the idea that when many individuals in an organization or society are corrupt, corruption becomes the norm or even the culture of this organization for generations ahead.

In this sense, our work contributes to the large political economy literature mobilizing incentives theory (for an overview, see Dixit, 2002). This literature has also considered the case of multiple principals (Laffont, 1999) to analyze the issues of separation of powers and the optimal design of delegation of supervisory functions to politicians. The multiple-task case has also been studied (Wilson, 1989) to shed light on the incentives of the government administration. To our knowledge, the multiple-agent case has, up to date, been given less attention in studying political economy matters. The theoretical aspect of the model is inspired by the incentives in organizations theory using principal-multiagents models, much of which stems from Holmström's (1982) seminal paper (see for an overview Fleckinger and Roux, 2012). Our framework is closely related to Che and Yoo (2001) who discuss the way optimal incentives in teams are affected by the underlying environment - such as information among peers - and point to the role of implicit incentives among peers, which also have a central role in our context. Our contribution to this literature is that we analyze a new form of *peer effect*, that is the detrimental effect of corruption on teams' efforts.

We study a game between a Politician and a Bureaucrat with a moral hazard problem: the first chooses whether to provide the high level of the public good or the low one, the second chooses whether to exert the effort or shirk. Moreover, we assume those two decisions are technologically interdependent; both the level of public good and the administration's effort contribute to the production of a certain output. They enter the production function either as complements or substitutes, with each technology having its own implications. Hence the players' efforts are technologically and, most importantly, strategically interdependent. Each player's decision thus affects the probability of success of the whole project, and hence affects the probability of success of his co-worker. Unlike "peer pressure" (Kandel and Lazear, 1992) and "over-confidence" (Goldstein and Gervais, 2004) that mitigate the moral hazard problem, especially when efforts are strategic complements, corruption amplifies the moral hazard problem, whether agents' efforts are complements or substitutes.

We then introduce the idea that there is a potential corruptor, a businessman, who wishes to bribe the Politician, the Bureaucrat or both in order to divert their decisions to his own benefit. For instance, if the Politician provides the low level of public good, he can divert the public funds to serve the interests of a certain businessman, by constructing for instance a highway that leads only to his factory. Similarly, if the Administration

shirks, it can direct all its effort to constructing this highway instead of contributing to the alternative project that benefits the society at large. We then analyze the effects of a bribe given to one of the two players. Evidently, a bribe given to a player has a detrimental effect on his incentives to exert the effort. Our main finding however is that this detrimental effect is even stronger in the context of a team than when there is a single player due to the strategic effect, whether players' efforts are complements or substitutes.

On the aggregate, the bribe given to one player has a domino effect on the whole team's effort in the case of complementarity. In the substitution scenario on the other hand, bribery, beside enhancing the incentives of the bribe-taker to shirk, it increases those of his co-worker's to exert a higher effort to make up for the bad performance of his colleague. We then conduct the analysis from the corruptor's perspective to see which player the bribe should be given to. The objective of this part is to better understand the different mechanisms in order to derive implications for anti-corruption policies. Throughout the analysis, we focus on the case where the corruptor needs both the politician's and the bureaucrat's efforts for the success of his private project. The businessman possibly needs the politician to divert public funds to construct a highway that leads to his factory, to underprovide a particular public good so as to make his CSR contributions more visible or not to pass a certain legislation on taxes that would harm his business. He may need to bribe the bureaucrat so that he could speed up some administrative work instead of directing his efforts to the execution of a certain public project. Finally, we then adopt a public good maximization perspective and discuss the optimal payoffs that should be given to each player, taking the possibility of bribery into account.

The question is *how the Constitution should set the optimal incentives for both the politician and the bureaucrats, given the possibility of corruption?* The question has parallels in the literature on *common agency*. Bernheim and Whinston (1986) present a model where multiple principals simultaneously and independently attempt to influence a common agent under complete information. The agent may take an unobservable action that determines the probability distribution of monetary rewards received by the various principals. Each principal's strategy consists of an outcome-contingent reward scheme. Prat and Rustichini (1998) consider the case in which the game is played in a sequential manner. Each principal makes an offer to the agent following a pre-specified order. Moreover each offer is public, so that the principals who have not yet made their offer can condition their strategy on the offers already made. After having observed the offers of

the different principals, the agent makes his choice.

Prat and Rustichini (2003) generalize the model of Bernheim and Whinston (1986) defining the concept of game played through agents (GPTA). A GPTA is a game where a set of players (the agents) take decisions that affect the payoff of another set of players (the principals) and the principals can, by means of monetary transfers, try to influence the decision of the agents. Martimort and Stole (2003) extend the classical model to allow for externalities whereby the contracting variable of one principal directly affects the other principal's payoff. They also extend the model to study the case of incomplete information to answer the question of *how the competition among principals affect the participation region of agents*. We build a model in a similar setup. The principals being the Constitution and the corruptor that move sequentially and set monetary rewards - the shares of the public good output and the private transfers respectively - as to influence their common agents, the politician and the bureaucrat, whose effort decisions affect both principals' payoffs. Agents' tendency for corruption being private information and only the team outcome being observable, we analyze how the principals attempt to affect the participation region of agents and hence the outcomes of the game.

The paper proceeds as follows. In section 2, we set up our basic model where bribes are exogenous. We analyze the implications of strategic interaction between players when efforts are complements and substitutes. In section 3 we endogenize the choice of bribes by introducing the corruptor as a principal. The mechanisms behind this choice are analyzed. We then introduce another principal, the Constitution, that sets the incentives for the different players to maximize the outcome of the public project, taking the possibility of corruption into account. Section 4 concludes.

## 3.2 Benchmark Model with Exogenous Transfers

First, we identify the role of the implicit incentives of the different players; then, we establish the type of technological interdependence existing between the different players' efforts. We then discuss how direct transfers or bribes come to affect this decision. This exercise clarifies the main mechanisms that will affect the corruptor's choice of bribery in the subsequent section and is also an interest of its own as it presents one of the main findings of the paper.

### 3.2.1 Basic Environment

**Choice variables and Outcomes** There is a politician  $P$ , an administration  $A$  (or a bureaucrat) and a continuum of citizens. The economy consists of one sector. The total output in the economy  $Y \in \{0, 1\}$  depends on both the amount of public good provided  $e^P$  and the effort exerted by the bureaucrat  $e^A$ . Neither the Politician's choice nor that of the Bureaucrat is observable, the joint outcome however is. By "public good" we mean a good that is provided by the government due to the conventional free-riding problems but also a good that has some positive externalities on the economy as a whole such as education, infrastructure, health care, etc. The amount of funds allocated to the public good provision is  $e^P$ , which can take on two values  $e^P \in \{e_0^P, e_1^P\}$ , is chosen by the politician. The bureaucrat does not observe whether the level of public good chosen by the politician is the high or low one, but may choose either high or low effort  $e^A \in \{e_0^A, e_1^A\}$ . Both effort decisions are however observable by the corruptor, as choosing  $e_0^i$  means serving his private interests. Hereafter, the superscript  $i$  denotes the player and  $j$  his co-worker such that  $i, j \in \{P, A\}$ .

Player  $i$ 's share in the total output is given by  $\omega^i$ . The politician taxes the total output in the economy at an exogenous rate  $\omega^P$  and gets all the proceeds from this taxation  $\omega^P Y^4$ . So, even if he cannot control his share of the total output, he has some incentive to provide  $e_1^P$  to increase the probability of  $Y = 1$  occurring and hence getting higher proceeds. Similarly, the bureaucrat earns a payment  $\omega^A Y$  that clearly is contingent on the total output in the economy, under the assumption that when the economy prospers, government administration will benefit. This provides an incentive for the bureaucrat to exert a high level of effort. Since the  $\omega$ 's are *shares* of the total output, the condition  $0 \leq \omega^P + \omega^A \leq 1$  must always hold.

**Implicit and Explicit Costs** On the other hand, each player incurs two costs should he choose to exert the high level of effort  $e_1^i$ , or alternatively, there are two private benefits for player  $i$  if he chooses  $e_0^i$ . First, there is an implicit benefit  $\beta^i$ , which expresses the player's *tendency for corruption*. It can be seen as some sort of a *morality* parameter, the higher  $\beta^i$ , the more corrupt the player is. For instance, a politician with a smaller  $\beta^P$  is a more *honest* politician with a greater dislike for shirking.<sup>5</sup> This implicit cost solely stems from personal traits of the player, such as education, family values..etc. We

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<sup>4</sup>Perhaps a less extreme interpretation would be simply that both the politician and the bureaucrat benefit from a larger  $Y$ .

<sup>5</sup>Or a greater dislike for accepting bribery as we shall see in what follows.

assume  $\beta^i$  to follow a certain distribution in  $[0, 1]$  with a probability density  $f^i(\beta^i)$  and a cumulative distribution  $F^i(\beta^i)$ . Throughout the paper,  $f^i(\beta^i)$  is assumed to be public knowledge whereas the realization of  $\beta^i$  is private information of player  $i$ .

Second, by choosing  $e_1^i$ , player  $i$  renounces a *private transfer*  $\tau^i$  that he gets only if he chooses the low level of effort. In the first part of the analysis, where  $\tau^i$  is exogenous, it is assumed to be observable by all players, this assumption will be relaxed in the next section as the exact amount of transfers would be inferred from the corruptor's objective function. In the broad sense, the private transfer  $\tau^i$  denotes the bribe player  $i$  receives from a corruptor in order to serve his private interests and hence divert his effort. In the case where  $\tau^i$  is exogenous and presumably observable,  $\tau^i$  would be a proxy for the amount of bribery that the player receives, and is limited to commonplace practices that are not formally punishable. For instance, one should think of  $\tau^P$  as being campaign contributions that the politician gets or a proxy for the amount of bribery that politicians usually receive from businessmen given the biography of the actors of the exchange, their professional experiences, the history of public policies put in place by the state to fight against corruption.. etc. As for the bribe offered to the bureaucrat  $\tau^A$ , it should be seen as the grease or speeding payments usually paid to public officials and that are widely accepted in many economies, especially when a high level of bureaucracy prevails<sup>6</sup>. Thus the scope of our model does not cover acts that are publicly stamped with the seal of the illicit, as such acts are hardly visible and formally punishable. We are concerned with commonplace corruption that is practiced daily and that eventually becomes one of the possible ways to access state services.

A  $\beta^i$ -type player's utility is thus given by:

$$U^i(e^i|e^j) = \begin{cases} \beta^i + \tau^i + \omega^i E(Y|e_0^i, e^j), & \text{if } e^i = e_0^i \\ \omega^i E(Y|e_1^i, e^j), & \text{if } e^i = e_1^i \end{cases} \quad (3.1)$$

where  $e^j$  denotes the co-worker's choice of effort.

**Technological Interdependence** So far we have not characterized the kind of technological interdependence existing between both players' efforts, we only assumed the production of  $Y$  to be stochastic and dependant on both effort decisions. We now precise

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<sup>6</sup>The inefficient rules give greater motivations for corruption to the public officials who are in charge of administering them as they might justify their violation as a way of helping their clients to circumvent unnecessary procedures, and the bribe as a reward for taking risks for them. In such a situation, corruption becomes common knowledge and an informal rule of the game, although each corrupt transaction is secretly done.

its exact functional form. The probability of success of the public project is denoted  $p_{ij}$  where  $i$  and  $j \in \{0, 1\}$  represent the subscript of the politician's and the bureaucrat's choice of effort respectively ( $e_k^P$  and  $e_l^A$ ). We distinguish two scenarios. The *complementarity case* implies, not only that  $p_{11} > p_{10}$  and  $p_{01} > p_{00}$ , but also that:

$$(p_{11} - p_{10}) > (p_{01} - p_{00})$$

meaning that the marginal product of bureaucrat's effort in terms of probabilities (i.e. the increase in the probability of obtaining  $Y = 1$  due to increasing the effort level from  $e_0^A$  to  $e_1^A$ ) is greater when matched with a higher level of the public good  $e_1^P$  than when it is matched with the low one<sup>7</sup>. In other words, player  $i$ 's effort is more effective when his co-worker exerts the effort. Let us denote by  $\gamma$  the *degree of complementarity* between the players' choices, such that:

$$\gamma = (p_{11} - p_{10}) - (p_{01} - p_{00}) \quad (3.2)$$

Thus, the higher the value of  $\gamma$ , the greater the gap between the marginal product of effort when matched with  $e_1^P$  and its marginal product when matched with  $e_0^P$ , hence the stronger the complementarity between effort and level of public good provided.

Second, we analyze the *substitution case* where each player, given that the other shirks, has more incentives to choose the high level of effort. Formally, this means that  $p_{11} - p_{10} < p_{01} - p_{00}$  and  $\gamma < 0$ . Let  $\lambda^{i0}$  denote the marginal productivity of player  $i$  when matched with a co-worker  $j$  who chooses to shirk, and  $\lambda^{i1}$  his productivity when  $j$  exerts the effort<sup>8</sup>. The degree of interdependence can thus be written as  $\gamma = \lambda^{i1} - \lambda^{i0}$ , this difference is the same whether  $i = P$  or  $A$ . It should be noted that  $\lambda^{i0}$  is always assumed to be positive, under the assumption that having one player on board always enhances the outcome relative to having none. When efforts are complements in the private project, not only is  $\lambda^{i0} > 0$  but also  $\lambda^{i1} > \lambda^{i0}$ ; having player  $j$  on board improves the productivity of player  $i$  and thus  $\gamma > 0$ . Substitution on the other hand implies that  $\lambda^{i0} > 0$  but  $\lambda^{i1} < \lambda^{i0}$ ;  $\lambda^{i1}$  can be either positive or negative so long as it is below  $\lambda^{i0}$ , player  $j$ 's decision to divert his effort either has a negative impact on the marginal productivity of  $i$  or a weak positive one such that player  $i$  is more likely to achieve a higher outcome by exerting the effort on his own. If  $\gamma = 0$  however, this is a case of independence of efforts:  $j$ 's choice of effort

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<sup>7</sup>This condition is to some extent similar to the supermodularity condition given in Che and Yoo (2001), except that we do not assume that  $p_{10} = p_{01}$ .

<sup>8</sup>For instance  $\lambda^{P0} = p_{10} - p_{00}$  and  $\lambda^{P1} = p_{11} - p_{01}$ .

does not affect the productivity of  $i$ . Finally note that the higher the *absolute value* of  $\gamma$ , the higher the degree of both complementarity and substitution i.e. the higher the degree of interdependence.

### 3.2.2 The Bayesian Nash Equilibrium

In this setting, we do not consider cooperative arrangements between players, based on the assumption that the agents cannot directly side contract with each other. In particular, the agents are not allowed to exchange side payments. Consequently, the agents can only interact through their effort decisions. Nonetheless, this limited interaction will be shown to generate a strategic effect that strengthens the effect of corruption, even in the absence of any relational incentives since we consider a static model.

The timing of the game goes as follows. Nature first chooses an implicit cost or tendency for corruption  $\beta^P$  for the politician and  $\beta^A$  for the bureaucrat. Each player learns his own type but cannot observe his co-worker's, he thus takes his decision based on his prior belief - the distribution of  $j$ -types in the economy  $f^j(\beta^j)$ . A corruptor then makes a transfer offer of  $\tau^P$  to the politician and  $\tau^A$  to the bureaucrat that each only receives should he choose the low level of effort which is observable by the corruptor.<sup>9</sup> Each player, given his expectation of the other player's type and based on the degree of interdependence between players' efforts, the payoffs and the private transfers that are exogenously offered by the corruptor, decides whether to exert the high or low level of effort. Effort choices are only observable by the corruptor. Total output is realized and both the Politician and the Bureaucrat get their shares,  $\omega^PY$  and  $\omega^AY$  respectively.

**Incentive Constraints** We first consider the incentive constraints of both players simultaneously. Player  $i$  chooses to exert the effort if  $U(e_1^i|e^j) \geq U(e_0^i|e^j)$ , that is, if

$$\beta^i \leq \omega^i [E(Y|e_1^i, e^j) - E(Y|e_0^i, e^j)] - \tau^i \equiv \hat{\beta}^i(e^j) \quad (3.3)$$

Where  $\hat{\beta}^i$  is the degree of corruptibility of player  $i$  who is indifferent between the high and low level of public funds, i.e. for which  $U^i(e_0^i|e^j) = U^i(e_1^i|e^j)$  given his co-worker's type-contingent strategy. Note that  $\hat{\beta}^i(e^j)$  is a best reply, not to a given effort of the opponent, but rather to a probability distribution over strategies. Player  $i$  must try to predict the type-contingent strategy of his co-worker, he must then be concerned with how

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<sup>9</sup>It should be noted that we abstract from the enforcement issues associated with this type of corruption contracts.

player  $j$  thinks player  $i$  would play for each possible type player  $i$  might have. And player  $i$  must also try to estimate player  $j$ 's beliefs about player  $i$ 's type, in order to predict the distribution of strategies that player  $i$  expects to face.

At equilibrium, all  $i$ -players with  $\beta^i$  below  $\hat{\beta}^i$  choose  $e_1^i$ , and so  $\hat{\beta}^i$  can be seen as the equilibrium threshold for accepting bribery. This brings us to the question of how we interpret the different types of  $i$ -players, i.e. the different values of  $\beta^i$ . We could simply think of the values of  $\beta^i$  as a way of describing different information sets of a single player  $i$ , who makes a type-contingent decision before he learns his type, i.e. at the *ex ante* stage. Alternatively, these values could be viewed as denoting different individuals, one of whom is selected by nature to appear when the game is played. Whether player  $i$  is thought of as predicting his opponent's play at the *ex ante* or the *interim* stage, all types of player  $i$  would make the same prediction about the play of the other players due to the Bayesian nature of the equilibria we are interested in, as each player's strategy must be a cutoff rule of the form *exert the effort if and only if*  $\beta^i \leq \hat{\beta}^i$ . Equilibrium is thus defined as a pair of effort strategies  $\{e^P(\beta^P), e^A(\beta^A)\}$  such that each player's strategy is a pointwise best response to the distribution of strategies of his opponent.

Since  $F^P(\cdot)$  and  $F^A(\cdot)$  denote the cumulative distributions of P and A's corruptibilities respectively,  $F^j(\hat{\beta}^j)$  is the probability that player  $j$  has a tendency for corruption that induces him to choose  $e_1^j$ :

$$F^j(\hat{\beta}^j) = \text{Proba}(\beta^j \leq \hat{\beta}^j) = \text{Proba}(e^j = e_1^j)$$

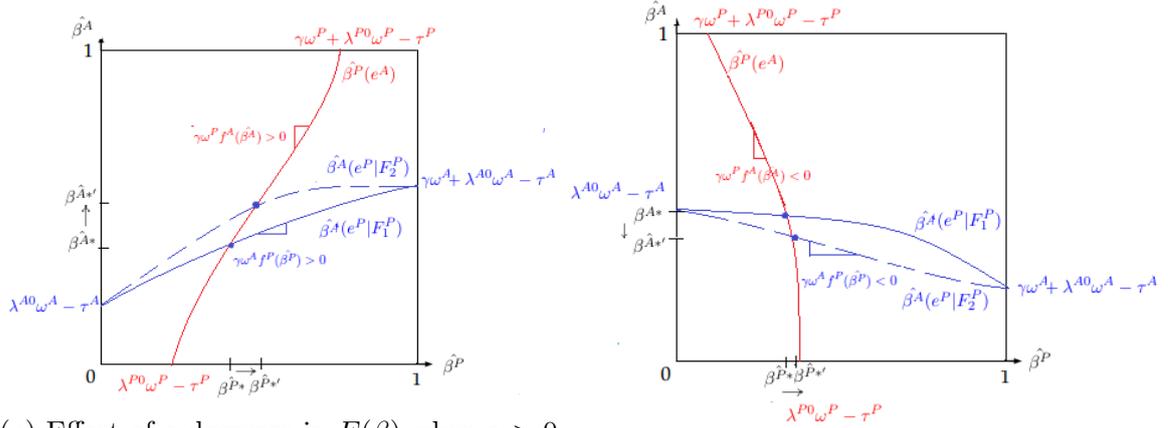
Now the expectation of the total output can be calculated in terms of perceived probabilities such that, from the politician's and the bureaucrat's perspective, respectively:

$$\begin{aligned} E(Y|e_1^P, e^A) - E(Y|e_0^P, e^A) &= [F^A(\hat{\beta}^A)p_{11} + (1 - F^A(\hat{\beta}^A))p_{10}] - [F^A(\hat{\beta}^A)p_{10} + (1 - F^A(\hat{\beta}^A))p_{00}] \\ &= F^A(\hat{\beta}^A)\gamma + \lambda^{P0} \\ E(Y|e_1^A, e^P) - E(Y|e_0^A, e^P) &= [F^P(\hat{\beta}^P)p_{11} + (1 - F^P(\hat{\beta}^P))p_{01}] - [F^P(\hat{\beta}^P)p_{01} + (1 - F^P(\hat{\beta}^P))p_{00}] \\ &= F^P(\hat{\beta}^P)\gamma + \lambda^{A0} \end{aligned}$$

where  $\gamma$  denotes the degree of technological interdependence and  $\lambda^{i0}$  the marginal productivity of player  $i$  when his co-worker shirks. Equilibrium threshold given by (3) for player  $i$  thus rewrites:

$$\hat{\beta}^i(e^j) = \gamma\omega^i F^j(\hat{\beta}^j) + \lambda^{i0}\omega^i - \tau^i \quad (3.4)$$

At equilibrium, the above equation has to be verified for both players. The question now



(a) Effect of a decrease in  $E(\beta)$  when  $\gamma > 0$  (b) Effect of a decrease in  $E(\beta)$  when  $\gamma < 0$

Figure 3.2: Representation of Equilibrium in the  $(\hat{\beta}^P, \hat{\beta}^A)$  space and FOSD shifts

is: what would make the perceived probability of  $i$  exerting the effort smaller or larger, or equivalently, what would make the pool of players who choose the high level of effort wider or narrower? We thus examine the determinants of  $\hat{\beta}^i$ .

There are two distinctive terms in eq.(4) that reflect two distinctive motives behind the politician's decision: the first is the *interactive* term and the second the *one man show* term. The interactive term  $F^j(\hat{\beta}^j)\gamma\omega^i$  has opposite mechanics whether the relation in question is complementarity or substitutability: a higher probability of the co-worker exerting the effort raises  $\hat{\beta}^i$  in the former case but reduces it in the latter. The one-man-show term  $\lambda^{i0}\omega^i$  shows that player  $i$  is more encouraged to provide  $e_1^i$  when his own marginal productivity, even when the other player exerts the low effort,  $\lambda^{i0}$  is high so that he is likely to achieve the high outcome on his own.

Strategic interaction between the politician and the bureaucrat consists here in recognizing that there is a degree of dependence between  $i$ 's threshold and that of  $j$  as illustrated in figure 2 . It is easily derived from the above equation:

$$\frac{d\hat{\beta}^i}{d\hat{\beta}^j} = \gamma\omega^i f^j(\hat{\beta}^j) \quad (3.5)$$

In the complementarity scenario, this implies that  $i$ 's action will be more dependent on that of  $j$ 's the higher the degree of complementarity and the higher the gain  $i$  expects to get from achieving the high level of output, hence the higher his own share of the total output  $\omega^i$ . One implication of this is that the threshold of the player with the higher payoff is more responsive to that of the co-worker's. Furthermore, the extent of this dependence varies with the density of  $\beta^j$  at the threshold value. When efforts are substitutable,

player  $i$ 's threshold will be more responsive to player  $j$ 's, the higher the *absolute value* of the degree of substitutability and the higher his  $\omega^i$ . Note that  $i$ 's response here is to decrease his  $\hat{\beta}^i$  when  $\hat{\beta}^j$  increases, whereas  $\hat{\beta}^i$  follows  $\hat{\beta}^j$  in the same direction when efforts are complements. Both players' cutoffs are thus strategic complements or substitutes depending on the scenario. This result will be important for the rest of the analysis.

### 3.2.3 Equilibrium Analysis

We now investigate the question of existence and uniqueness of equilibrium. Solving the incentive constraints for player  $i$  and  $j$  given by (4) simultaneously yields:

$$\hat{\beta}^i = \gamma\omega^i F^j[\gamma\omega^j F^i(\hat{\beta}^i) + \omega^j \lambda^{j0} - \tau^j] + \omega^i \lambda^{i0} - \tau^i = \psi(\hat{\beta}^i) \quad (3.6)$$

We refer to  $\psi(\hat{\beta}^i)$  as the *perceived probabilities curve* as it contains the prior beliefs,  $F^i(\cdot)$  and  $F^j(\cdot)$ , as well as the data pertaining to the calculation of expected probabilities,  $\omega$  and  $\tau$ .

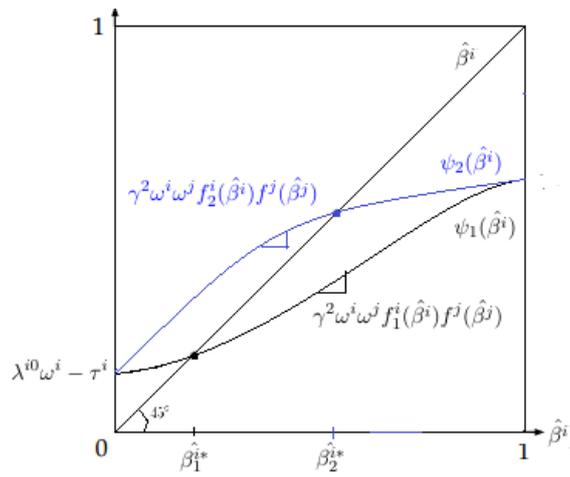
**Lemma 16.** *There exists a unique stable equilibrium in both the complementarity and substitution scenarios, whenever  $0 < \omega^i \lambda^{i0} - \tau^i < 1 - \gamma\omega^i F^j[\gamma\omega^j + \omega^j \lambda^{j0} - \tau^j]$ , defined by*

$$\hat{\beta}^i = \psi(\hat{\beta}^i)$$

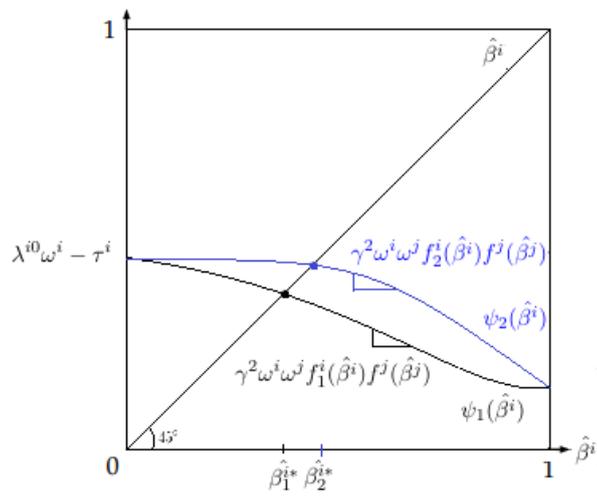
*Proof.* • *Existence of Equilibrium:* Since  $\psi(\hat{\beta}^i)$  is continuous over  $[0, 1]$  with  $\psi(0) = \lambda^{i0}\omega^i - \tau^i$  and  $\psi(1) = \gamma\omega^i F^j[\gamma\omega^j + \omega^j \lambda^{j0} - \tau^j] + \omega^i \lambda^{i0} - \tau^i$ , existence of equilibrium is ensured by the intermediate value theorem whenever  $\psi(0) > 0$  and  $\psi(1) < 1$ ; those two conditions are satisfied for the range of values of  $\omega^i \lambda^{i0} - \tau^i$  defined by the above lemma.

- *Uniqueness and Stability of Equilibrium:* Eq.(6) can be seen as a fixed point representation of the problem. Since  $\frac{d\psi(\hat{\beta}^i)}{d\hat{\beta}^i} = \gamma^2\omega^P\omega^A f^i(\hat{\beta}^i) f^j(\hat{\beta}^j) \leq 1$  holds  $\forall \hat{\beta}^i, \hat{\beta}^j$  (as  $\gamma, \omega, f^i(\cdot)$  and  $f^j(\cdot) \in [0, 1]$ ), equilibrium, when it exists, is unique and stable. □

Figure 3 better explains this result. An equilibrium cutoff for  $i$ -players,  $\hat{\beta}^{i*}$ , is such that the graph of the perceived probabilities curve intersects the  $\hat{\beta}^i$  curve. Since the slope of the  $\psi(\hat{\beta}^i)$  curve is always smaller than 1, the two curves can only cross once, yielding a unique equilibrium. Equilibrium is driven by the mechanism of *self-fulfilling*



(a) Effect of a decrease in  $E(\beta)$  when  $\gamma > 0$



(b) Effect of a decrease in  $E(\beta)$  when  $\gamma < 0$

Figure 3.3: Representation of Equilibrium in the  $(\hat{\beta}^i, \psi(\hat{\beta}^i))$  space and FOSD shifts

*beliefs* whereby the prior beliefs can actually drive the outcomes of the game through the strategic channel. If player  $j$  believes his co-worker  $i$  is likely to exert the effort (i.e. for a large  $\hat{\beta}^i$ ), player  $i$  will actually have higher incentives to exert the effort. To see this, consider the complementarity case, an increase in the perceived probability  $\hat{\beta}^i$  increases  $j$ 's incentives to exert the effort as the high outcome is now more likely to be achieved. This in turn increases  $i$ 's own incentives as the gain at stake from cooperating with  $j$  becomes larger. If efforts are substitutes, an increase in  $\hat{\beta}^i$  reduces  $\hat{\beta}^j$  since  $j$  can now depend on  $i$  alone to achieve the high outcome. Player  $i$  anticipating this response from his co-worker has even more incentives to work to compensate for his decreased effort. On the other hand, and by a similar mechanism, if the bureaucrat is suspicious towards the politician - i.e. if he believes  $\hat{\beta}^P$  to be low - there is no point for the politician to exert the effort either because he will not be rewarded (in the complementarity case) or because the bureaucrat will already be filling his place (in the substitution scenario). Since players do not have the ability to coordinate, multiple equilibria may arise:  $\hat{\beta}_1^{i*}$ ,  $\hat{\beta}_2^{i*}$  and  $\hat{\beta}_3^{i*}$  in figure 3 are all possible equilibrium thresholds for player  $i$  and to each corresponds a  $\hat{\beta}^{j*}$  that can be obtained from (4).

**First Order Stochastic Dominance** We now investigate how the changes in the distributional forms affect the equilibrium, assuming it exists. Precisely, we analyze how first-order stochastic dominance changes in  $F^i(\cdot)$  and  $F^j(\cdot)$  influence the equilibrium cut-offs  $\hat{\beta}^i$  and  $\hat{\beta}^j$ .

**Lemma 17.** *For any given distributions  $F^i$  and  $F^j$ :*

- *When  $\gamma > 0$ , a lower  $E(\beta^i)$  and/or  $E(\beta^j)$  implies larger  $\hat{\beta}^{i*}$  and  $\hat{\beta}^{j*}$ .*
- *When  $\gamma < 0$ , only a lower  $E(\beta^i)$  increases  $\hat{\beta}^{i*}$  whereas a lower  $E(\beta^j)$  reduces it.*

*Proof.* Consider two economies 1 and 2, characterized by two CDFs for the distribution of  $i$ -players' corruptibility,  $F_1^i(\beta^i)$  and  $F_2^i(\beta^i)$ . If  $F_1$  is first-order stochastic dominant over  $F_2$ , that is  $F_1^i(\beta^i) < F_2^i(\beta^i)$  for all  $\beta \in [0, 1]$ , this implies that  $E_1(\beta^i) > E_2(\beta^i)$ . From (6), since  $\hat{\beta}^{i*}$  increases in both  $F^i$  and  $F^j$  when  $\gamma > 0$  but decreases in  $F^j$  and only increases in  $F^i$  when  $\gamma < 0$ , the above result obtains.  $\square$

Graphically, in figure 2, a decrease in  $E(\beta^i)$  translates into a shift of the opponent's reaction curve  $\hat{\beta}^j$  curve upwards (downwards) in the case of complementarity (substitution). Figure 3 represents the same effect through an upward (downward) shift of the  $\psi$  curve when efforts are complements (substitutes). The intuition behind this result is

simple and stems from the mere mechanism of complementarity / substitution. In the case of complementarity, an economy with a lower average corruptibility of the politicians and/or the bureaucrats should be characterized by a wider pool of both politicians and bureaucrats refusing bribery. When efforts are substitutes, only a decrease in the average corruptibility of the politicians widens the pool of politicians exerting the effort, a smaller average corruptibility of the bureaucrats has the perverse effect of narrowing it. In the complementarity scenario, this implies that a  $\tilde{\beta}^P$ -type politician may exert the effort in one economy but accept bribery and shirk in the other because of the mere fact that the prior belief about the average corruptibility of politicians and/or bureaucrats is lower in the former than in the latter.

A lower average corruptibility of  $i$ -players increases player  $j$ 's perceived probability of  $i$  exerting the effort as it increases  $F^i(\beta^i)$ . Player  $i$ , anticipating this reasoning from the part of  $j$  since the prior beliefs are public knowledge, adjusts his expected probability of  $j$  exerting the effort upwards. This in turn increases  $i$ 's gain at stake from exerting the effort in the case of complementarity, thus widening the pool of  $i$ -players exerting the effort and refusing bribery. In the substitution scenario, a similar reasoning applies. As  $E(\beta^j)$  decreases, a wider pool of  $j$  players exert the effort, player  $i$  can now depend on his co-worker to achieve the high outcome and  $\hat{\beta}^i$  is reduced. Whereas when it is  $E(\beta^i)$  that decreases,  $j$ 's perceived probability of  $i$  exerting the effort increases,  $j$  has less incentives to exert the effort since he can now depend on his co-worker. Player  $i$ , calculating that  $j$  is now less-likely to exert the effort has more incentives to work to substitute for him.

### 3.2.4 The Private Transfers into Play

A simple comparative statics exercise is now used to assess the impact of a higher bribe  $\tau^i$  exogenously offered by a corruptor to player  $i$  in case he shirks. The aim of this analysis is to highlight the strategic component of players' response to bribery. It is clear that  $\tau^i$  reduces the probability of  $i$  exerting the high effort since it increases the value of his outside option and this is the direct effect of bribery. We are interested here however in the bribe effect induced by the technological interdependence of efforts. Does being part of a team enhance the bribe effect or does it provide some sort of hedging against bribery? The following proposition and the proof that follow answer this question.

**Proposition 18.** *Whether  $\gamma \leq 0$ , for any given  $F^i$  and  $F^j$ , a bribe is more likely to be accepted ( $|\frac{d\hat{\beta}^i}{d\tau^i}|$  is larger) by a player in a team than by a single player.*

*Proof.* Differentiating equation (6) with respect to  $\tau^i$  yields:

$$\begin{aligned}
\frac{d\hat{\beta}^i}{d\tau^i} &= \frac{d\hat{\beta}^i}{d\hat{\beta}^j} \times \frac{d\hat{\beta}^j}{d\tau^i} + \frac{\partial\hat{\beta}^i}{\partial\tau^i} \\
&= \frac{d\hat{\beta}^i}{d\hat{\beta}^j} \times \left( \frac{d\hat{\beta}^j}{d\hat{\beta}^i} \times \frac{d\hat{\beta}^i}{d\tau^i} \right) + \frac{\partial\hat{\beta}^i}{\partial\tau^i} \\
&= \gamma\omega^i f^j(\hat{\beta}^j) \times \left[ \gamma\omega^j f^i(\hat{\beta}^i) \times \frac{-1}{1 - \gamma^2\omega^P\omega^A f^i(\hat{\beta}^i) f^j(\hat{\beta}^j)} \right] - 1 \\
&= \frac{-\gamma^2\omega^i\omega^j f^i(\hat{\beta}^i) f^j(\hat{\beta}^j)}{1 - \gamma^2\omega^i\omega^j f^i(\hat{\beta}^i) f^j(\hat{\beta}^j)} - 1 \\
&= \frac{-1}{1 - \gamma^2\omega^P\omega^A f^i(\hat{\beta}^i) f^j(\hat{\beta}^j)}
\end{aligned} \tag{3.7}$$

since  $\gamma, \omega, f^i()$  and  $f^j() \in [0, 1]$ , the denominator is always positive and smaller than 1. Hence  $|\frac{d\hat{\beta}^i}{d\tau^i}| > 1$ , whether  $\gamma \leq 0$ .  $\square$

The effect of the bribe on player  $i$ 's decision breaks down into a strategic effect and a direct one. The direct effect  $\frac{\partial\hat{\beta}^i}{\partial\tau^i} = -1$  is straightforward; increasing the transfer given to  $i$  reduces his incentive to make the effort and hence shifts his  $\hat{\beta}^i$  to the left by an amount equal to the bribe; i.e. the pool of  $i$ 's exerting the high level of effort narrows. If player  $i$  were a single player, in the sense that the total output depends on his effort alone, this would be the total effect of the bribe. However, due to the interdependence of his effort with that of player  $j$ , another dimension must be taken into account. The strategic effect (represented by the first term) is crucial for the analysis. Recall that both players are strategically dependent. Hence, bribing  $i$  would not only affect  $i$ 's decision, but also that of  $j$ . When the transfer given to  $i$  increases,  $j$  anticipates  $i$ 's reaction to his own bribe and  $\hat{\beta}^j$  adjusts accordingly. So  $i$ , anticipating  $j$ 's reaction to his bribe  $\tau^i$ , takes into account this response and  $\hat{\beta}^i$  is thus affected. Finally, note that  $\gamma$  in the denominator is squared, meaning that, regardless of the sign of  $\gamma$ , the same result holds. In other words, the finding applies whether players' efforts are complements or substitutes.

The previous proposition states that the marginal effect of the bribe in widening the pool of politicians who would accept the bribe - from the corruptor's perspective - and hence increase the probability that a given politician, whose type is a priori unknown to the corruptor, would accept the bribe - is amplified by the mere fact that the politician's effort is interdependent with the bureaucrat's. This strategic interaction is proved to make bribery more likely to be accepted both in the complementarity and the substitution cases. The intuition as well as the main mechanisms behind this proposition differ between the complementarity and the substitution scenarios. Consider the case where  $i$  and  $j$ 's efforts

are complements ( $\gamma > 0$ ). When the private transfer that  $i$  receives increases,  $j$  knows that there is a loss in the probability of  $i$  choosing the high effort;  $\frac{d\hat{\beta}^i}{d\tau^i} < 0$ . Anticipating this response from  $i$  and because their efforts are complementary,  $j$  will be less motivated to choose the high level of effort himself (since  $\frac{d\hat{\beta}^j}{d\hat{\beta}^i} = \gamma\omega^j \times f^i(\hat{\beta}^i) > 0$ ) since it is now harder for him to make the project succeed. Now  $i$ , anticipating this reasoning from the part of  $j$  will take this expected response into account and becomes even more likely to choose the low effort (since  $\frac{d\hat{\beta}^i}{d\hat{\beta}^j} = \gamma\omega^i \times f^j(\hat{\beta}^j) > 0$ ) since  $j$  is now less likely to choose the high effort. This strategic effect comes to strengthen the direct effect. So  $\tau^i$ , instead of reducing  $\hat{\beta}^i$  by a factor 1 (the direct effect only), it reduces this threshold by  $\frac{1}{1-\gamma^2\omega^P\omega^A f^i(\hat{\beta}^i)f^j(\hat{\beta}^j)} > 1$ .

To clarify the idea, assume that the Politician receives a direct transfer or bribe  $\tau^P$ . If he was not in a team, meaning that the output and his payoff only depended on his own effort, his incentives of providing the high level of public good decrease by the amount of the bribe. Now if we assume he is working in a team, he has to take his co-worker's perceived probability of him exerting the high effort following the bribe, and adjust his own calculated probability  $\hat{\beta}^A$  accordingly. The Bureaucrat, learning that the Politician has received a certain  $\tau^P$ , reduces his calculated  $\hat{\beta}^P$  - he thus anticipates that the pool of *honest* politicians who would provide  $e_1^P$  narrows - making it less likely that the high outcome will be achieved. The politician also reduces  $\hat{\beta}^A$  since the bureaucrat is now more likely to shirk. Hence, the politician, aware of the strategic interdependence between his choice and that of the bureaucrat's, and anticipating this reasoning from the part of his co-worker becomes even more likely to shirk, A adjusts his calculated  $\hat{\beta}^P$  further downward.

Following the increase in  $\tau^P$ , instead of having all politicians in  $[0, \hat{\beta}^P - d\tau^P]$  choosing  $e_1^P$ , only those with  $\beta \in [0, \hat{\beta}^P - d\tau^P - \frac{\gamma^2\omega^i\omega^j f^i(\hat{\beta}^i)f^j(\hat{\beta}^j)}{1-\gamma^2\omega^i\omega^j f^i(\hat{\beta}^i)f^j(\hat{\beta}^j)} d\tau^P]$  do. The pool of *honest* politicians, who exert the high level of effort and thus reject bribery, narrows even more due to the interdependence of efforts. We refer to this effect in the complementarity case as the *domino effect* as it makes both players less likely to exert the high effort. As can be seen from the strategic term in (7),  $\tau^i$  reduces the threshold  $\hat{\beta}^A$  by  $\frac{-\gamma\omega^j \times f^i(\hat{\beta}^i)}{1-\gamma^2\omega^i\omega^j f^i(\hat{\beta}^i)f^j(\hat{\beta}^j)} d\tau^P$ . The pool of bureaucrats choosing  $e_1^A$  narrows as well. An increase in the bribe offered to player  $i$ , beside having an enhanced effect on the probability of  $i$  accepting it, also affects the probability that his co-worker  $j$  shirks, even without receiving any forms of bribery.

Proposition 2.1 still holds in the case where  $e^P$  and  $e^A$  are substitutes ( $\gamma < 0$ ), the intuition behind however differs. The main difference here is that an increase in the probability of one player exerting the effort makes the other more likely to shirk, since he

knows he can depend on the other's effort to achieve the high outcome. Formally, this means that both  $\frac{d\hat{\beta}^j}{d\beta^i}$  and  $\frac{d\hat{\beta}^i}{d\beta^j}$  are negative. Let us reinterpret eq.(7): when  $\tau^i$  increases,  $j$  knows that  $i$  will have less incentives to choose the high effort. Since the players' efforts are now substitutes,  $j$  will be more motivated to increase his effort in order to compensate for the loss of probability of  $i$  choosing the high effort. So  $j$ , knowing that  $i$  anticipates this response from him, reduces his calculated  $\hat{\beta}^i$  even more. Assume the politician and the bureaucrat's efforts are substitutable, meaning that each player is more productive when working on his own. If the Politician receives a private transfer  $\tau^P$ , he has incentives to decrease his effort. This will increase the bureaucrat's incentives to exert the effort in order to make up for the politician's shirking. Thus the politician has even more incentives to shirk, not only as a direct response to the bribe he is given, but also as a strategic response to  $j$ 's anticipated reaction to the bribe  $\tau^i$ .

**Bribe Target Effect, Cross Effect and Team Corruption Effect** Before proceeding, it is useful to develop some terminologies for characterizing the different effects the bribe has on the different players. Since a transfer offered to an  $i$ -player affects both the pool of  $i$ -players and  $j$ -players accepting bribery, and also affects them differently, it is necessary to distinguish between the target and cross effects of the bribe. We refer to the effect of a bribe offered to player  $i$  on his own decision  $\frac{d\hat{\beta}^i}{d\tau^i}$  as the *target effect of the bribe*. From eq.(7), we deduce that the target effects of the bribe is the same, whether it is offered to player  $i$  or  $j$ , and whether the players' efforts are complements or substitutes. So giving the politician a bribe narrows the pool of politicians who exert the effort the same way giving it to the administration does. In other words, from the corruptor's perspective, a bribe increase of  $\Delta\tau$ , whether given to the politician or the bureaucrat, increases the probability of the bribed player accepting it and shirking by the same amount:

$$\frac{d\hat{\beta}^i}{d\tau^i} = \frac{d\hat{\beta}^j}{d\tau^j} = \frac{-1}{1 - \gamma^2 \omega^P \omega^A f^i(\hat{\beta}^i) f^j(\hat{\beta}^j)}$$

The *Cross Bribe Effect* denotes its effect on the other player's decision ( $\frac{d\hat{\beta}^j}{d\tau^i}$ ). From the decomposition of the above effect for both players, we extract the cross bribe effects as follows:

$$\frac{d\hat{\beta}^i}{d\hat{\beta}^j} \frac{d\hat{\beta}^j}{d\tau^i} = \frac{d\hat{\beta}^j}{d\hat{\beta}^i} \frac{d\hat{\beta}^i}{d\tau^j}$$

And hence,

$$\frac{\frac{d\hat{\beta}^i}{d\tau^j}}{\frac{d\hat{\beta}^j}{d\tau^i}} = \frac{\omega^i}{\omega^j} \times \frac{f^j(\hat{\beta}^j)}{f^i(\hat{\beta}^i)} \quad (3.8)$$

Two remarks are useful at this point. First, note that in the complementarity case, the cross effect of the bribe  $\frac{d\hat{\beta}^i}{d\tau^j}$  is always negative; thus bribing the Politician decreases not only his own incentives to exert the effort, but also those of the Bureaucrat, we refer to this as the *domino effect of corruption*. When efforts are substitutes, the cross effects of the bribes are positive. There is no domino effect here. On the contrary, the detrimental target effect of the bribe on one agent may be partially or totally offset by the positive cross effect on his co-worker. This finding has some important and extremely different implications for the corruptor's decision as to whom the bribe should be offered to as will be discussed.

Second, the cross effect of the bribe breaks down into a dependency component and a distributional factor. As  $\tau^j$  increases,  $\hat{\beta}^i$  falls in the complementarity case (increases in the substitution case). This decrease (increase) is sharper the larger the dependency of  $i$ 's gain at stake from exerting the effort on  $j$ 's effort decision - as represented by his share  $\omega^i$  - but also the larger the weight attributed to  $\hat{\beta}^j$  at the threshold value; so the larger the loss in probability of  $j$ -players exerting the effort. Hence to know which cross effect is larger, one has to know the exact distributions of  $\beta^P$  and  $\beta^A$ . The total effect of the bribe on both players' decisions ( $\frac{d\hat{\beta}^i}{d\tau^i} + \frac{d\hat{\beta}^j}{d\tau^i}$ ) will be referred to as the *team corruption effect* and it also depends on both the relative shares of both players and on the distributional form of the politicians and the bureaucrats.

### 3.3 Endogenous Bribery Decisions

In this section, we introduce a principal, the businessman or corruptor, who sets the amounts of transfers to be given to one or both players, assuming it is in his interest to divert both players' efforts. One could think of the example of a businessman who wishes to bribe the politician to induce him to divert the public funds to constructing a road that leads to his own factory and who needs the bureaucrat to carry out the necessary administrative work. We analyze the corruptor's choice of which player to bribe. We then discuss some implications for corruption-proof incentives and optimal degree of interdependence between players' efforts.

Up to this point of the analysis, a general-form distribution has been used to present the main insights. Clearly, this has the advantage of rendering the analysis sufficiently

general to be applied in different setups. However, in order to be able to determine optimal bribery decisions and hence corruption-proof incentives for the players as functions of their productivities <sup>10</sup>, we specify a distributional form for players' corruptibilities to simplify the analysis. We apply the model presented in the previous section to the uniform distribution case to lay the groundwork for the endogenous bribery game.

### 3.3.1 Minimizing the Cost of Bribery

Hereafter, we assume players' corruptibilities  $\beta^P$  and  $\beta^A$  to be both uniformly distributed over the interval  $[0, 1]$ . Performing a similar exercise, applying eq.(4) to the uniform case yields:

$$\hat{\beta}^i = \gamma\omega^i\hat{\beta}^j + \lambda^{i0}\omega^i - \tau^i \quad (3.9)$$

The degree of interdependence between equilibrium thresholds is:

$$\frac{d\hat{\beta}^i}{d\hat{\beta}^j} = \gamma\omega^i$$

which solely depends on the share of player  $i$  and the degree of interdependence of efforts. Solving eq.(9) for both players simultaneously, we obtain the bayesian subgame perfect Nash equilibrium at which player  $i$ 's threshold for accepting bribery is given by:

$$\hat{\beta}^i = \frac{(\lambda^{i0}\omega^i - \tau^i) + \frac{d\hat{\beta}^i}{d\hat{\beta}^j}(\lambda^{j0}\omega^j - \tau^j)}{1 - \gamma^2\omega^i\omega^j} \quad (3.10)$$

Player  $j$  thus calculates  $i$ 's probability of exerting the effort as the sum of  $i$ 's *net motivation regardless the relation with player  $j$* , which is simply the amount he can gain by choosing the high level of effort compared to the direct transfer he can get otherwise, and *how  $j$  perceives  $i$ 's response to his own net motivation* and this is where the strategic effect appears. Given  $j$ 's gain from exerting the high effort,  $i$  would have more or less incentives depending on the nature of interdependence between efforts.  $\hat{\beta}^i$  increases in both own and other player's motivations when efforts are complements. In contrast, it increases in own motivation and decreases in other player's incentives when they are substitutes. Now the different effects of the bribe can be simply analyzed.

**Lemma 19.** *The total detrimental effect of the bribe on both players' efforts is largest when given to the player with the smallest (largest) share of the total output in the com-*

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<sup>10</sup>in both the public project and the private business of the corruptor as will be discussed in the next section

plementarity (substitution) case.

*Proof.* Differentiating (10) with respect to  $\tau^i$ , we obtain the decomposition of the bribe effect in the uniform distribution scenario:

$$\begin{aligned}
\frac{d\hat{\beta}^i}{d\tau^i} &= \frac{d\hat{\beta}^i}{d\hat{\beta}^j} \times \frac{d\hat{\beta}^j}{d\tau^i} + \frac{\partial\hat{\beta}^i}{\partial\tau^i} \\
&= \frac{d\hat{\beta}^i}{d\hat{\beta}^j} \times \left( \frac{d\hat{\beta}^j}{d\hat{\beta}^i} \times \frac{d\hat{\beta}^i}{d\tau^i} \right) + \frac{\partial\hat{\beta}^i}{\partial\tau^i} \\
&= \gamma\omega^i \times \left( \gamma\omega^j \times \frac{-1}{1 - \gamma^2\omega^P\omega^A} \right) - 1 \\
&= \frac{-\gamma^2\omega^i\omega^j}{1 - \gamma^2\omega^i\omega^j} - 1 \\
&= \frac{-1}{1 - \gamma^2\omega^P\omega^A}
\end{aligned} \tag{3.11}$$

The target effects are similar since  $\frac{d\hat{\beta}^i}{d\tau^i} = \frac{d\hat{\beta}^j}{d\tau^j} = \frac{-1}{1 - \gamma^2\omega^P\omega^A}$ . The ratio between the cross effects is given by

$$\frac{\frac{d\hat{\beta}^j}{d\tau^i}}{\frac{d\hat{\beta}^i}{d\tau^j}} = \frac{\omega^j}{\omega^i}$$

And hence the player with the largest share - i.e. the highest gain at stake from the realization of the high outcome - is the most responsive to his co-worker's bribe. This cross effect being negative (positive) in the case of complementarity (substitution), the team corruption effect is largest for the bribe that induces the highest cross effect when efforts are complements and the weakest one when they are substitutes.  $\square$

This result will be particularly important when identifying the player to whom the bribe should be offered in order to minimize the cost of bribery, from the corruptor's perspective. Should the corruptor wish to maximize the probability of both players shirking, and if he is to give the transfer to only one player, he should choose the bribe that has the strongest team corruption effect. In the complementarity case, this amounts to bribing the player with the largest cross effect since the target effects are the same. From the above analysis, the transfer should be given to the player with the lowest share of the total output. This result is both intuitive and coherent with what is observed in reality and especially in developing countries where the less-paid agents are more frequently bribed.

The intuition behind this result is the following. Consider it is the Administration that receives the lowest share of the output ( $\omega^A < \omega^P$ ). The trigger of the domino effect, which is the target bribe effect, is the same whether the businessman chooses to bribe the Administration or the Politician as we have seen earlier. The chain reaction however is

not, it is strongest when it is triggered by a bribe targeted to the less-paid agent because then a chain reaction is generated by the well-paid agent who is the most sensitive to the other's actions. If the transfer is given to the Administration, the latter will decrease its  $\hat{\beta}^A$  but then, the Politician having a high  $\gamma\omega^P$  will be very responsive to this decrease and his incentives to provide the high level of public good will fall dramatically, causing the administration's incentives to further diminish in response. Note that it may be profitable for the corruptor to bribe both players and thus trigger two domino effects, this will be discussed in details when the choice of bribery is endogenized in the following section.

In the substitution case however, the team's effort-minimizing bribe is the one with the lowest cross effect. That is, the businessman should bribe the agent with the highest share of the total output because in this case, the incentives to work of the less-paid agent will not increase by a large amount in response. In the above example, if the Administration receives the lowest share, and the businessman wants to minimize both the level of the public good and the administration's effort to divert them to his own benefits, he should give the transfer to the Politician. Otherwise, the Politician would have high incentives to step in and compensate the Administration's decreased efforts (due to the substitution effect). Note that if the Politician's and Bureaucrat's efforts are also substitutes in the private project of the businessman, he may not need to decrease the total effort effect and it suffices to corrupt only the agent who is most productive for that particular project, regardless of the cross effects of the bribe.

The question that now arises is whether the efforts being close complements enhances or reduces the *domino effect* of corruption within teams. This question is of particular importance for the design of agencies within the government and the optimal degree of interdependence that should be required. The value of technological interdependence can be seen by fixing  $p_{01}$  and  $p_{01}$ . As  $p_{11}$  increases and/or  $p_{00}$  decreases, players' efforts become more interdependent ( $\gamma$  increases). This latter change can occur when the government adopts a process that requires more coordination between the politician and the bureaucrat. A case in point is the increased level of bureaucracy required to undertake a certain public project. We investigate how such change affects the response of the different agents to bribery. The following lemma brings some useful insights into this matter.

**Lemma 20.** *In the uniform distribution case, the target effect of the bribe  $\frac{d\hat{\beta}^i}{d\tau^i}$  is a bell shaped function of the degree of interdependence of efforts  $\gamma$ . Whereas the magnitude of the cross effect of the bribe  $\frac{d\hat{\beta}^i}{d\tau^j}$  is a decreasing function of  $\gamma$ .*

*Proof.* From the differentiation of eq.(11) with respect to  $\gamma$ , we obtain:

$$\frac{d(d\hat{\beta}^i/d\tau^i)}{d\gamma} = \frac{-2\gamma\omega^P\omega^A}{(1-\gamma^2\omega^P\omega^A)^2} \quad (3.12)$$

Clearly,  $\frac{d(d\hat{\beta}^i/d\tau^i)}{d\gamma} < 0$  when  $\gamma > 0$ ; meaning that the strategic effect of bribery (and hence the total effect) becomes stronger as the degree of complementarity as denoted by  $\gamma$  increases as this further reduces  $\hat{\beta}^i$ . In the substitution case,  $\frac{d(d\hat{\beta}^i/d\tau^i)}{d\gamma} > 0$  so the effect is attenuated as  $\gamma$  increases ( $|\gamma|$  decreases), as can be seen from equation (12). Similar to the complementarity case, when efforts are substitutes, a higher degree of interdependence  $\gamma$  has a stronger detrimental effect on the probability of the bribed player exerting the high level of effort. The second part of the lemma is obtained by differentiating the cross effect with respect to  $\gamma$ . Note that the magnitude of the cross effect always increases in  $|\gamma|$ , it is a decreasing function of  $\gamma$  however because this cross effect is positive when  $\gamma < 0$  and negative when  $\gamma > 0$ .  $\square$

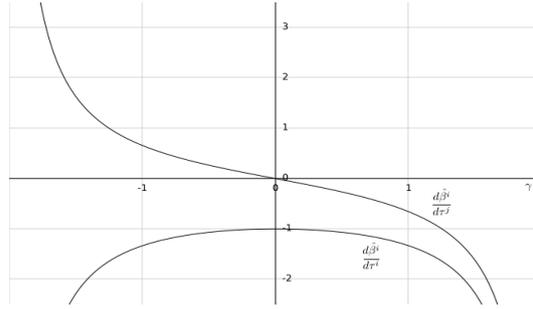


Figure 3.4: Effect of  $\gamma$  on the Magnitude of Target and Cross Effects of the bribe

To see this, we analyse both players' reasoning. First note that as  $\gamma$  increases, both players become more sensitive to each other's choice of action, formally this means that both  $\frac{d\hat{\beta}^j}{d\hat{\beta}^i}$  and  $\frac{d\hat{\beta}^i}{d\hat{\beta}^j}$  increase, meaning that equilibrium thresholds become even more interdependent. Now that  $\gamma$  is larger, from player  $j$ 's perspective,  $i$  is likely to revise his calculated  $\hat{\beta}^j$  further downward given that efforts are complements,  $i$ 's expected payoff from exerting the effort decreases, hence  $j$  reduces his perceived  $\hat{\beta}^i$  even more. The *team corruption effect* is accentuated by the higher value of  $\gamma$ .

In the substitution scenario,  $\gamma$  also makes both players more responsive to each other's choices. Hence a small increase in the private transfer  $\tau^i$  reduces  $i$ 's motivation to choose the high effort greatly since he can depend on  $j$  to obtain the high outcome  $Y = 1$ . So  $j$  anticipates this large decrease in  $\hat{\beta}^i$  and becomes even more motivated to exert the high effort since he knows he is more likely to make the project succeed on his own. Antici-

pating this relatively large increase in  $\hat{\beta}^j$ ,  $i$  becomes even more responsive to the bribe. Intuitively, a larger  $\gamma$  - in absolute terms - emphasizes the strategic effect as it magnifies the gain at stake from shirking when the co-worker becomes more likely to exert the effort in the substitution case, but also the potential loss that the player would have to incur when his co-worker becomes more likely to shirk in the complementarity scenario.

### 3.3.2 The Corruptor as a Principal

From now on, we consider the perspective of the corruptor. Suppose that if the Politician provides the low level of public good  $e_0^P$ , he can divert the public funds to serve the interests of a certain businessman, by constructing for instance a highway that leads only to his factory. Furthermore, suppose that if the Administration shirks, it can direct all its effort to constructing this highway instead of contributing to the public good provision. In this example, it is in the businessman's interest to corrupt the Politician, the Bureaucrat or both, to divert their efforts from the public good provision to the project that solely benefits him. Alternatively, we can think of  $e_0^P$  as being the choice of the politician not to provide a certain public good, making the businessman's intervention through his CSR activities more valuable <sup>11</sup>. Finally  $e_0^P$  (or  $e_0^A$ ) may refer to the politician (or the bureaucrat) not carrying out a public project that could have harmed the corruptor's private business, such as a certain legislation on taxes.

The game now consists of one principal, the corruptor, and two agents - the politician and the bureaucrat. The former undertakes a private project, the outcome of which  $B$  is stochastic and depends on the effort decisions of both agents. To influence those decisions, the businessman can offer the agents private transfers  $\tau^P$  and  $\tau^A$ . The principal's objective is thus to maximize his profits given by:

$$\max_{\tau^P, \tau^A} = E(B|e^P, e^A) - \tau^P - \tau^A \quad (3.13)$$

**Production Technology of B** The private project's outcome  $B$  can take on two values, 0 or 1. The probability of success of the businessman's private project is given by  $m_{(1-k)(1-l)}$  where  $k, l \in \{0, 1\}$  represent the subscripts of the politician's and the bureaucrat's effort decisions respectively ( $e_k^P$  and  $e_l^A$ ). Hence we assume that when player

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<sup>11</sup>Corporate Social Responsibility is viewed in this example as the businessman providing a certain public good through his private business; e.g. funding a school in a poor neighborhood, providing water relief to a deprived area... The model thus applies to all forms of CSR where the businessman's intervention can be seen as a substitute for the government's.

$i$  shirks from the public project, he exerts the effort in the private one. It is not possible for any player to shirk or exert the effort in both projects. Also note that we do not assume any form of correlation between the probabilities of success of both projects  $m_{(1-k)(1-l)}$  and  $p_{kl}$ . In other words, each player is not necessarily equally - or even proportionally - productive in both projects; the corruptor's objective does not have to be at odds with the public project's success. This added generality allows the model to analyze various scenarios.

Following the same notation used in the previous section, the marginal productivities of player  $i$  in the corruptor's project are given by  $\lambda_C^{i0}$  when his co-worker directs his efforts to the public project and  $\lambda_C^{i1}$  when  $j$  chooses to divert his efforts to serve the businessman's interests. The degree of interdependence of efforts is thus given by  $\gamma_C = \lambda_C^{i1} - \lambda_C^{i0}$ . We restrict our attention to the case where  $\gamma_C > 0$ .

**Timing of the game** Nature determines both the politician's and the bureaucrat's corruptibilities  $\beta^P$  and  $\beta^A$  that are their respective private information. In stage 1 of the game, the businessman, based on the beliefs he has about the agents' types and given the nature of interdependence between their efforts in his private project, makes them transfer offers of  $\tau^P$  and  $\tau^A$ , so as to maximize his expected payoff. In the second stage of the game, each player, knowing his own tendency for corruption and given his prior about his co-worker's type, the nature of interdependence of their efforts in the public project and the exogenous shares they both get  $\omega^P$  and  $\omega^A$ , decides whether or not to divert his efforts towards serving the businessman's interests. The latter then observes both players' choices and gives player  $i$  his respective transfer  $\tau^i$  only if he actually directed his efforts to the private project or has simply shirked from the public one. Finally, outcomes in both the private and public projects are realized, both players get their respective shares from the output in the public project in the case of success  $\omega_i$  and the businessman gets all the proceeds from  $B$ .

**Optimal Transfers** The game described above will be solved backwards. The corruptor now integrates the thresholds for exerting the effort given by (10) into the calculation of his expected outcome from his private project:

$$E(B|G, e) = \hat{\beta}^P \hat{\beta}^A \gamma_C - \hat{\beta}^A \lambda_C^{P1} - \hat{\beta}^P \lambda_C^{A1} \quad (3.14)$$

Plugging this expected outcome into the maximization problem in (12) and using the results for the target and cross bribe effects elaborated in the previous section, we find that the expression for the optimal bribe that should be offered to player  $i$  is given by:

$$\begin{aligned}\tau^{i*} &= \lambda^{i0} \omega^i + \frac{[\gamma \omega^i \lambda_C^{i1} - \lambda_C^{j1}]}{\gamma_C} + \frac{[(1 - \gamma \omega^i) - \gamma \omega^i (1 - \gamma \omega^j)]}{\gamma_C} \\ &= \lambda^{i0} \omega^i + A^i(\boldsymbol{\omega}) + S^i(\boldsymbol{\omega}, \boldsymbol{\lambda}_C)\end{aligned}\tag{3.15}$$

where  $\boldsymbol{\omega}$  denotes the vector of players' shares from the public project  $(\omega^i, \omega^j)$  and  $\boldsymbol{\lambda}_C$  the marginal productivities vector  $(\lambda_C^i, \lambda_C^j)$ . Three factors are behind the choice of  $\tau^i$ . First, the *compensation term*  $\lambda^{i0} \omega^i$ , which is the base amount that would be required to divert player  $i$ 's efforts from the public project. Disregarding any strategic or interdependence considerations, a player with a higher productivity needs a larger bribe to dissuade him from directing his efforts to the public project where the high outcome is likely to be achieved through his efforts alone ( $\lambda_C^{i0} = 1$ ) and thus his expected effort likely to be large. Second, the *arbitrage term*  $A^i$  takes into account how the corruptor mobilizes both  $\tau^i$  and  $\tau^j$ . Finally, the value of  $\tau^{i*}$  depends on who the target player for the corruptor is - i.e. the one with the larger productivity in the private project and that triggers the strongest the chain reaction in terms of productivity. The *strategic term*  $S^i$  thus determines how much the corruptor would be willing to pay to have player  $i$  divert his efforts, given its strategic effect on  $j$  and eventually on  $i$  himself. Whereas the compensation term is straightforward and does not differ from the substitution to the complementarity scenario, the other two terms will be discussed in details in what follows, as they differ in the essence from one scenario to the other.

### 3.3.3 Optimal Bribery Decisions

We now return to the question of *who the bribe should be offered to*. Precisely, we analyze how the bribe each player is offered varies with his share in the public project output.

**Making use of the Domino Effect when Efforts are Complements** First we consider the *complementarity case* where both  $\gamma$  and  $\gamma_C > 0$ . In this scenario, is it always the case that a larger bribe should be offered to the lower-paid player as the previous results suggest? The answer is not straightforward. From a cost minimization perspective, the answer is positive. From a productivity standpoint however, it is not necessarily so.

**Lemma 21.** *When both  $\gamma$  and  $\gamma_C > 0$ ,  $\frac{dA^i}{d\omega^i} < 0$ ,  $\frac{dS^i}{d\omega^i} > 0$ , so  $\frac{d\tau^{i*}}{d\omega^i} \leq 0$*

This lemma states that, *in the complementarity case, from a cost minimization perspective, a higher bribe should be offered to the player with the lower payoff  $\omega^i$  as it generates the strongest domino effect. However from a strategic point of view, a bribe offered to the player with the larger  $\omega^i$  generates a higher multiplying effect on the corruptor's expected payoffs. Thus the relation between the optimal bribe and the player's share is a priori ambiguous.* To see this, we analyze the different determinants of the corruptor's bribery decision given in (15).

The arbitrage term refers to the part of the choice of  $\tau^{i*}$  that is relevant to the trade-off between  $\tau^i$  and  $\tau^j$ , since both channels of bribery reduce both equilibrium cutoffs  $\hat{\beta}^P$  and  $\hat{\beta}^A$ . To see the different mechanics behind the choice of  $\tau^i$  from a cost minimization perspective, let us rewrite  $A^i$  as:

$$\begin{aligned} A^i(\omega) &= \frac{1 - \gamma^2 \omega^i \omega^j}{\gamma_C} \left[ - \left( \frac{d\hat{\beta}^i}{d\tau^i} + \frac{d\hat{\beta}^i}{d\hat{\beta}^j} \times \frac{d\hat{\beta}^j}{d\tau^i} \right) + \left( \frac{d\hat{\beta}^i}{d\tau^j} + \frac{d\hat{\beta}^i}{d\hat{\beta}^j} \times \frac{d\hat{\beta}^j}{d\tau^j} \right) \right] \quad (3.16) \\ &= \frac{1 - \gamma^2 \omega^i \omega^j}{\gamma_C} \left[ \underbrace{\left( \left| \frac{d\hat{\beta}^i}{d\tau^i} \right| + \frac{d\hat{\beta}^i}{d\hat{\beta}^j} \times \left| \frac{d\hat{\beta}^j}{d\tau^i} \right| \right)}_{\text{reduction in } \hat{\beta}^i \text{ resulting from } \tau^i} - \underbrace{\left( \left| \frac{d\hat{\beta}^i}{d\tau^j} \right| + \frac{d\hat{\beta}^i}{d\hat{\beta}^j} \times \left| \frac{d\hat{\beta}^j}{d\tau^j} \right| \right)}_{\text{reduction in } \hat{\beta}^i \text{ resulting from } \tau^j} \right] \quad \text{when } \gamma > 0 \end{aligned}$$

A bribe offered to either player reduces both players' incentives to exert the effort in the public project. The corruptor is able to use both  $\tau^i$  and  $\tau^j$  as complementary tools to divert the different players' efforts to serving his private interests. When setting the optimal  $\tau^{i*}$ , he thus faces a trade-off between affecting  $\hat{\beta}^i$  either through  $\tau^i$  or  $\tau^j$ . The arbitrage term breaks down into two components: the impact of  $\tau^i$  in reducing  $\hat{\beta}^i$  - both directly and strategically - less the fall in  $\hat{\beta}^i$  caused by  $\tau^j$ . The difference between the two terms can be seen as the comparative advantage of  $\tau^i$  over  $\tau^j$  in reducing  $\hat{\beta}^i$ . Note that  $A^i$  may be  $\leq 0$ . A positive  $A^i$  means that the domino effect of corruption provides larger incentives for the corruptor to offer bribery. Furthermore, both  $A^P$  and  $A^A$  can be simultaneously positive; this implies that each bribe has a comparative advantage in affecting the player it is offered to. In such a case, it is likely to have both  $\tau^P$  and  $\tau^A > 0$ . Finally note that, from a cost minimization perspective, a larger bribe should be offered to the player with the smaller payoff<sup>12</sup> as he triggers the larger domino effect and hence reduces the total cost of bribery.

Behind the previous analysis is the idea that, even if it is unnecessary on technological

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<sup>12</sup>  $\frac{dA^i}{d\omega^i} = -\gamma(2 - \gamma\omega^j)$  is negative whenever  $\gamma > 0$ .

ground, it may be optimal to bribe a player only to trigger a response from his co-worker. Let us now examine the productivity component of the corruptor's decision. As efforts are interdependent, the businessman faces another choice: which player is more productive in his private project and hence which  $\hat{\beta}$  he should seek to further reduce. The strategic term in equation (15) rewrites:

$$S^i(\omega, \lambda_C) = \frac{\gamma\omega^i\lambda_C^{i1} - \lambda_C^{j1}}{\gamma_C} \quad (3.17)$$

This term refers to the strategic gain - in terms of productivity - for the corruptor that results from bribing player  $i$ . It reflects the idea that  $\tau^i$  results in a chain reaction of responses from  $\hat{\beta}^i$  and  $\hat{\beta}^j$ . If the chain triggered by targetting player  $i$  is getting weaker, it is better replaced by targetting  $j$ . To see this, consider the domino effect initiated by  $\tau^i$ :  $\hat{\beta}^i$  falls as a direct effect of the bribe,  $\hat{\beta}^j$  decreases as a strategic response and this further reduces  $\hat{\beta}^i$ . This translates into increased expected payoffs for the corruptor of

$$\underbrace{d\hat{\beta}^i \times \lambda_C^{i0}}_{\text{standalone productivity of } i} + \underbrace{d\hat{\beta}^j \times d\hat{\beta}^i \times \lambda_C^{j1}}_{\text{increased marginal productivity of } j} + \underbrace{d\hat{\beta}^i \times d\hat{\beta}^j \times d\hat{\beta}^i \times \lambda_C^{i1}}_{\text{increased marginal productivity of } i}$$

Recall that  $\lambda_C^{j1}$  breaks down into  $\lambda_C^{j0} + \gamma_C$ ; the corruptor gains in expectation terms  $\gamma_C \frac{d\hat{\beta}^j}{d\tau^i}$  if player  $i$  diverts his efforts and  $\lambda_C^{j0} \frac{d\hat{\beta}^j}{d\tau^i}$  if only player  $j$  does, and similarly for  $\lambda_C^{i1}$ . In other words,  $S^i$  does not only consider the standalone marginal productivity, but rather the multiplying effect the bribe could have on the corruptor's expected payoffs by exploiting the complementarity in productivities in both projects.

If this chain is getting stronger (i.e.  $\gamma\omega^j \times \lambda_C^{j1} < \gamma\omega^i \times \gamma\omega^j\lambda_C^{i1}$ ),  $\tau^i$  is said to have a *strategic advantage* over  $\tau^j$ . Note that the strategic term cannot be positive for both  $\tau^{i*}$  and  $\tau^{j*}$ <sup>13</sup>. However, both  $S^i$  and  $S^j$  can be negative, that is if the chains induced by both bribes are getting weaker, the bribe should then target the player with the smaller strategic disadvantage. Clearly, a larger productivity - whether  $\lambda_C^{i0}$  or  $\lambda_C^{i1}$  - enhances  $S^i$  and hence the more productive player is offered a larger bribe. What is more interesting to analyze is how the strategic term relates to the player's share  $\omega^i$  rather than his productivity. We find that, *from a strategic standpoint, the bribe should target the player who is most responsive to his co-worker's decision, and hence has a larger share  $\omega$*  as can be easily seen from the positive derivative  $\frac{dS^i}{d\omega^i} = \gamma \frac{\lambda_C^{i1}}{\gamma_C}$ . We conclude that the relation between the player's share and the optimal bribe the corruptor sets for him is ambiguous. On the one

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<sup>13</sup>it is not possible to have  $\frac{\lambda_C^{i1}}{\lambda_C^{j1}} > \frac{1}{\gamma\omega^j}$  and  $\frac{\lambda_C^{i1}}{\lambda_C^{j1}} < \gamma\omega^i$  at the same time since  $\frac{1}{\gamma\omega^j} > 1$  and  $\gamma\omega^i < 1$ .

hand, the corruptor ought to offer a larger bribe to the less-paid player to induce a larger domino effect and minimize the total cost of bribery. On the other, bribing the better-paid player induces a stronger chain reaction that translates into higher expected payoffs for the businessman.

**Substitution and the Offsetting Effects Dilemma** Unlike the previous scenario where  $\tau^P$  and  $\tau^A$  serve the same end, they have offsetting effects in the substitution case. The question is *when is it worthwhile for the corruptor to bear the additional cost of offsetting the effects of his own bribes?* A bribe offered to player  $i$  makes it more likely that  $i$  serves the businessman's interests but less likely that  $j$  would. The question that arises now is: *can it be optimal for the corruptor to bribe both players even though it generates offsetting effects?* We distinguish between two cases; namely, whether both players' efforts are needed for the success of the private project ( $\gamma_C > 0$ ) or the corruptor mainly needs to divert one player's efforts ( $\gamma_C < 0$ ).<sup>14</sup>

**Lemma 22.** *In the Substitution Scenario  $\gamma < 0$ :*

- If  $\gamma_C < 0$ ,  $\tau^{i*} = \tau^{j*} = 0$ .
- If  $\gamma_C > 0$ ,  $\frac{d\tau^{i*}}{d\omega^i} > 0$  and it is possible to have both  $\tau^{i*}, \tau^{j*} > 0$ .

*Proof.* To prove the first part of the lemma, let us rewrite equation (15) as:

$$\tau^{i*} = \lambda^{i0}\omega^i + (\gamma\omega^i - 1) + \frac{x}{\gamma_C}$$

where  $x = [(1 - \lambda_C^{j0}) + \gamma\omega^i(\lambda_C^{i0} + \gamma\omega^j - 2)]$  is positive whenever  $\gamma < 0$ . Hence,  $\tau^i \geq 0$  iff  $\lambda^{i0}\omega^i + \gamma\omega^i \geq 1 - \frac{x}{\gamma_C}$ . Since  $(\lambda^{i0} + \gamma)\omega^i = \lambda^{i1}\omega^i$  can never exceed 1 (as both  $\lambda^{i1}$  and  $\omega^i \leq 1$ ), the above inequality can never hold so long as  $\gamma, \gamma_C < 0$ .

The second part can be seen from the derivatives  $\frac{dA^i}{d\omega^i}$  and  $\frac{dS^i}{d\omega^i}$  which are positive whenever  $\gamma < 0$  and  $\gamma_C > 0$ . □

The above lemma states that, *when efforts are substitutes in both projects, the corruptor has no incentives to offer neither player a bribe.* This result is perhaps not straightforward. Even if the corruptor is certain to achieve the high outcome in his private project through player  $i$ 's efforts alone, it is not profitable to bribe him: if he is the highly productive player in both the public and private projects, he is costly to bribe as a large amount

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<sup>14</sup>Such distinction was not necessary in the complementarity case as there is no difference in the essence. There is always the possibility of bribing both player since both  $\tau^P$  and  $\tau^A$  work in the same direction. The only difference is that the amount of bribery required would be lower.

would be needed to divert his effort from the public project in which he has a large gain at stake. If he is not quite productive in the public project but highly productive in the private one, his co-worker would expect him to serve the businessman's interests and substitutes for him in the public project, it is then needless for the corruptor to intervene as he is better off depending on the mere substitution mechanism in the public project. In other words, the gap between the expected payoff from bribery and its actual cost is always large and it is never worthwhile for the businessman to offer bribes in this context. *When efforts are substitutes in the public project but complementary in the private venture, it may be profitable for the corruptor to bear the cost of offsetting the counter effects of his own bribes and thus a bribe is likely to be offered to one player (as  $\gamma_C$  approaches 0) - the one with the larger share  $\omega$  -, or both (as  $\gamma_C$  approaches 1).* This can be explained by both the fact that bribing the player with the largest share induces the smallest counter effect of the bribe that would need to be offset, but also because the gain in productivity from this player will be the largest as he would be more responsive to his co-worker shirking and is likely to compensate the negative effect of the latter on the corruptor's expected payoffs.

Let us first consider the arbitrage term, which solely depends on the degree of interdependence of efforts in the public project, regardless of their interdependence in the private one. Equation (16) for the substitution case will be of the form:

$$A^i(\omega) = \frac{1 - \gamma^2 \omega^i \omega^j}{\gamma_C} \left[ \underbrace{\left( \left| \frac{d\hat{\beta}^i}{d\tau^i} \right| + \frac{d\hat{\beta}^i}{d\hat{\beta}^j} \times \left| \frac{d\hat{\beta}^j}{d\tau^i} \right| \right)}_{\text{fall in } \hat{\beta}^i \text{ resulting from } \tau^i} + \underbrace{\left( \left| \frac{d\hat{\beta}^i}{d\tau^j} \right| + \frac{d\hat{\beta}^i}{d\hat{\beta}^j} \times \left| \frac{d\hat{\beta}^j}{d\tau^j} \right| \right)}_{\text{perverse effect of } \tau^j \text{ to be offset}} \right] \quad \text{when } \gamma < 0 \quad (3.18)$$

The arbitrage term is always positive so long as  $\gamma < 0$ , the bribe that would have to be given to player  $i$  to divert his efforts increases as player  $i$ 's responsiveness to his own bribe increases, but also as his responsiveness to a bribe given to his co-worker increases. Since efforts are substitutes in the public project, bribing both players generates offsetting effects. Unlike the complementarity scenario where a bribe offered to one player reduces the amount of transfers needed to divert his co-worker's efforts, the *perverse* cross effect of  $\tau^j$  here represents an additional cost for the corruptor and hence a disincentive to offer bribes. We find that, only when the corruptor needs both players in his private project  $\gamma_C > 0$ , would he bear the cost of those counter effects; so he increases each bribe by the amount that is needed to offset the counter effect of the other. This is the scenario where bribery is most costly for the corruptor. In this case, a larger bribe is offered to the player

with the highest share from the public project output as it induces the smallest cross effect and thus requires less increase in his coworker's bribe to offset it.

To analyze the strategic term, we refer to (17). When  $\gamma < 0$  but  $\gamma_C > 0$ , the strategic term is always negative: this represents a disincentive for bribery from the corruptor's perspective. Bribing player  $i$  diverts his efforts towards the private project but incites player  $j$  to exert the effort in the public one. A transfer  $\tau^i$  reduces  $\hat{\beta}^i$ , so the corruptor gains in expected payoff the standalone productivity of  $i$  ( $\lambda_C^{i0}$ ), but loses both the standalone productivity of  $j$  as well as the marginal productivity of  $i$  had his co-worker diverted his efforts to the private project as well ( $\lambda_C^{j0} + (1 - \gamma\omega^i)\lambda_C^{i1}$ )<sup>15</sup>. From a strategic standpoint, bribery becomes less desirable - adding that it is even more costly because of the counter effects. In this scenario, as the need of the corruptor to have both players on board increases ( $|\gamma_C|$  increases), it becomes more likely that positive transfers are offered to both players. A larger bribe, if any, is offered to the player with the larger share  $\omega^i$  as he induces the smaller counter effect and hence the smaller total cost of bribery, but also because he induces a smaller fall in his co-worker's probability of diverting his efforts to serve the businessman's interests. Table 1 summarizes the above results as well as the main findings of the following analysis.

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<sup>15</sup>note that  $\lambda_C^{i1}$  can be negative in the substitution case, so it may add up to the gain from  $\tau^i$ .

	Corruptor's Perspective		Constitution Objectives	
	To minimize the cost of bribery	To maximize expected outcome of the private project	To reduce the corruptor's incentives for offering bribery	To maximize expected output from the public project
$\gamma > 0$	target player with <i>lower</i> $\omega \Rightarrow$ <i>strongest domino effect</i>	target player with larger $\omega$ and/or higher productivity $\lambda_C^{i0}$	offer the most productive player in the private project high incentives $\Rightarrow$ he becomes costly to bribe	Provide higher incentives to the more productive player in the public project
$\gamma < 0$	target player with <i>larger</i> $\omega \Rightarrow$ <i>smallest counter effect</i> on co-worker that would need to be offset	target player with larger $\omega$ and/or higher productivity $\lambda_C^{i0}$	provide <i>lower</i> incentives to the more productive in the private project $\Rightarrow$ large cross effect on the co-worker $\Rightarrow$ total cost of bribery $\uparrow$	provide lower incentives as productivity of co-worker in the public project increases

Table 3.1: Bribery and Corruption-proof Incentives

### 3.3.4 Corruption-Proof Incentives

Assume the different players' shares from the public good  $(\omega^i, \omega^j)$  are set by the Constitution so as to maximize the expected level of public good. The choice of the players' respective payoffs takes place in the first stage. This amounts to adding a stage to the game described at the beginning of this section, previous to the choice of bribes by the corruptor.

Taking the values of both bribes  $\tau^i$  and  $\tau^j$  from (15) and plugging the results into (10), we find that, at equilibrium, the pool of politicians or bureaucrats ( $i = P, A$  respectively) exerting the high level of effort is determined by the threshold:

$$\hat{\beta}^i = 1 - \frac{(1 - \gamma\omega^i) - \lambda_C^{j0}}{\gamma_C} \quad (3.19)$$

**Effect of an increase in  $\omega^i$**  The comparative statics of the share from the public project on equilibrium thresholds can now be analyzed. For the remainder of the paper, we assume players' efforts to be complements in the businessman's private project  $\gamma_C > 0$ .

We then distinguish between two cases: whether efforts are complements or substitutes in the public project. The case where efforts are substitutes in both projects, as shown earlier, generates its own disincentives for corruption and thus it is needless to derive corruption-proof payoffs in this scenario.

**Lemma 23.** *Given that  $\gamma_C > 0$ , an increase in player's  $i$  payoff from the public project*

- *widens the pool of  $i$ -players exerting the effort when  $\gamma > 0$ .*
- *narrows the pool of  $i$ -players exerting the effort when  $\gamma < 0$ .*

This lemma can be easily seen from the derivative  $\frac{d\hat{\beta}^i}{d\omega^i} = \frac{\gamma}{\gamma_C}$  which is always positive in the first case and negative in the second. To see the intuition behind, first consider the case where efforts are complements in the public project. An increase in player  $i$ 's share from the public project increases his probability of exerting the effort in the public project, in the presence of a corruptor, despite the fact that the transfer given to his co-worker increases<sup>16</sup> and whether the private transfer offered to  $i$  increases in response or not. When player's  $i$  share increases, his gain at stake from directing his efforts to the public project increases, both from the standalone productivity  $\gamma\omega^i$  and the strategic interaction with his co-worker  $\gamma^2\omega^i\omega^j$ . The increase in the private transfer covers the increase in gain from the standalone productivity (which is simply the compensation term discussed in the optimal bribe) but does not offset the strategic gain for  $i$  because otherwise it would be costly for the corruptor. The best the businessman can do in this scenario is to try to attenuate the impact of the increase in  $i$ 's share from the public project, he offers a larger transfer to his co-worker as well so as to mitigate the *counter* domino effect that could work against him.

When efforts are substitutes in the public project, a higher payoff for player  $i$  in the public project has the counter productive effect of reducing his incentives to work and he becomes more likely to divert his efforts to serve the businessman's interests. Clearly, this goes through the bribery channel. As player  $i$ 's payoff rises, this incites the corruptor to increase the private transfer he offers  $i$  as he now generates for him a strong chain reaction in terms of productivities, as well as a smaller counter effect to be offset so both the businessman's expected payoffs from bribery rise and its total cost is reduced. The compensation term in (15) ensures that player  $i$  will be remunerated for the increase in his gain at stake from the standalone productivity in the public project. In this scenario, the co-worker  $j$  witnesses an increase in his private transfer -  $\frac{d\tau^j}{d\omega^i}$  is positive - as the corruptor

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<sup>16</sup>from(15), it can be seen that  $\frac{d\tau^j}{d\omega^i} = \frac{\gamma^2\omega^j}{\gamma_C}$

needs to direct both players' efforts to his private venture. This increase however is not sufficiently large to counter the effect of  $i$ 's increased bribe through the strategic interaction in the public project.

**Optimal Choice of Payoffs** Payoffs from the public project, therefore, influence the subsequent bribe offers made by the corruptor, which in turn affects the pool of players exerting the effort, the corruptor's profitability, and the level of public good in the economy. Those payoffs will thus be the focus of the following analysis as we derive the *optimal corruption proof incentives* that maximize the expected level of public good in the economy, taking into account the bribe offers that would be made later by the corruptor. The Constitution's objective is given by:

$$\begin{aligned} & \underset{\omega^P, \omega^A}{\text{maximize}} && E(Y|e^P(\boldsymbol{\omega}), e^A(\boldsymbol{\omega})) \\ & \text{subject to} && \omega^P + \omega^A \leq 1 \\ & \text{and} && \omega^P, \omega^A \geq 0 \end{aligned}$$

where  $E(Y[G, e](1 - \omega^P - \omega^A)) = \hat{\beta}^P \hat{\beta}^A \gamma + \hat{\beta}^P \lambda^{P0} + \hat{\beta}^A \lambda^{A0} + p_{00}$  and the values of  $\hat{\beta}^P$  and  $\hat{\beta}^A$  are given by (19). Solving this maximization problem, we obtain the results presented in the following proposition.

**Proposition 24.** *Given  $\gamma_C > 0$ , and under the condition that  $2 + \frac{\lambda^{P0} + \lambda^{A0}}{\gamma} + \frac{\lambda_C^{P0} + \lambda_C^{A0}}{\gamma_C} > \frac{2-\gamma}{\gamma_C}$ , to maximize the expected outcome of the public project:*

1. if  $\gamma > 0$ ,

$$\omega^{i*}(\boldsymbol{\lambda}, \boldsymbol{\lambda}_C) = \frac{1}{2} + \frac{\gamma_C}{2\gamma} \left( \frac{\lambda_C^{i0} + \lambda_C^{j0}}{\gamma_C} + \frac{\lambda^{i0} - \lambda^{j0}}{\gamma} \right) \quad (3.20)$$

2. if  $\gamma < 0$ ,

$$\omega^{i*}(\boldsymbol{\lambda}, \boldsymbol{\lambda}_C) = \frac{1 - \lambda_C^{j0} - \gamma_C \left(1 + \frac{\lambda^{j0}}{\gamma}\right)}{\gamma} \quad (3.21)$$

*Proof.* Let  $\xi$  denote the lagrange multiplier of the above maximization problem. The Lagrange function is given by:

$$L(\boldsymbol{\omega}) = \hat{\beta}^P \hat{\beta}^A \gamma + \hat{\beta}^P \lambda^{P0} + \hat{\beta}^A \lambda^{A0} + p_{00} + \xi(1 - \omega^i - \omega^j)$$

which is linear in both  $\omega^P$  and  $\omega^A$  and hence the Kuhn-Tucker conditions are necessary and sufficient for a maximum.

- We start by assuming the inequality constraint to be binding. Setting  $\frac{\partial L}{\partial \omega^P} = \frac{\partial L}{\partial \omega^A} = \frac{\partial L}{\partial \xi} = 0$ , we find that

$$\omega_1^{i*} = \frac{1}{2} + \frac{\gamma_C}{2\gamma} \left( \frac{\lambda_C^{i0} + \lambda_C^{j0}}{\gamma_C} + \frac{\lambda^{i0} - \lambda^{j0}}{\gamma} \right)$$

and

$$\xi = \frac{1}{2} \left[ \frac{\gamma^2}{\gamma_C^2} (\lambda_C^{P1} + \lambda_C^{A1} + \gamma - 2) + \frac{\gamma}{\gamma_C} (\lambda^{P0} + \lambda^{A0}) \right]$$

The complementary slackness condition is satisfied, for both  $\gamma_C \leq 0$  when

$$\xi > 0 \iff 2 + \frac{\lambda^{P0} + \lambda^{A0}}{\gamma} + \frac{\lambda_C^{P0} + \lambda_C^{A0}}{\gamma_C} > \frac{2 - \gamma}{\gamma_C} \quad (3.22)$$

- Now if we assume  $\xi = 0$ , this implies that the inequality constraint is not binding. Setting  $\frac{\partial L}{\partial \omega^P} = \frac{\partial L}{\partial \omega^A} = 0$  and solving for  $\omega^P$  and  $\omega^A$ , we obtain

$$\omega_2^{i*} = \frac{1 - \lambda_C^{j0} - \gamma_C \left( 1 + \frac{\lambda^{j0}}{\gamma} \right)}{\gamma}$$

and thus for the complementary slackness to be satisfied, we need to have

$$\frac{\partial L}{\partial \xi} = 0 \iff \omega^P + \omega^A < 1 \iff 2 + \frac{\lambda^{P0} + \lambda^{A0}}{\gamma} + \frac{\lambda_C^{P0} + \lambda_C^{A0}}{\gamma_C} > \frac{2 - \gamma}{\gamma_C} \quad (3.23)$$

this condition coincides with (22), so both  $\omega_1^{i*}$  and  $\omega_2^{i*}$  are plausible maxima in both cases. By substitution in the objective function however, we find that  $E(Y|\boldsymbol{\omega}_1) > E(Y|\boldsymbol{\omega}_2)$  when  $\gamma_C > 0$  and  $E(Y|\boldsymbol{\omega}_2) > E(Y|\boldsymbol{\omega}_1)$  when  $\gamma_C < 0$  where  $\boldsymbol{\omega}_1 = (\omega_1^P, \omega_1^A)$  as defined by (20) and  $\boldsymbol{\omega}_2 = (\omega_2^P, \omega_2^A)$  as defined by (21).

□

**Optimal Payoffs and Productivities in Both Projects** Now we would like to examine how the players' shares in the public projects depend on their productivities in both the private and public projects, taking the possibility of corruption into account. In other words, *who should be offered higher incentives by the Constitution so as to hedge against corruption?*

**Proposition 25.** *Given  $\gamma_C > 0$ , player  $i$  should be offered a larger share from the public project output*

1. *the higher his productivity in both the private and the public project  $\lambda^{i0}$  and  $\lambda_C^{i0}$ , when*

$\gamma > 0$ .

2. the lower  $j$ 's productivity in the public project  $\lambda^{j0}$  but the higher  $j$ 's productivity in the private one  $\lambda_C^{j0}$ , when  $\gamma < 0$ .

When efforts are complements in both projects, the more productive player in both should optimally be offered higher incentives by the Constitution. This can be easily seen from the derivatives of (20): both  $\frac{d\omega^i}{d\lambda^{i0}} = \frac{1}{2\gamma^2}$  and  $\frac{d\omega^i}{d\lambda_C^{i0}} = \frac{1}{2\gamma}$  are positive. Evidently, the player who is more productive in the public project should be rewarded as it makes him more likely to exert the effort, and hence increases the incentives of his co-worker to exert the effort as well. Most interesting is *why should payoffs in the public project increase in player's productivity in the private venture, regardless of his productivity in the public project itself?* The idea is not simply to compensate the productive player for the opportunity cost of the effort he exerts in the public project, since  $\frac{d\omega^i}{d\lambda_C^{i0}}$  is positive regardless the value of  $\lambda^{i0}$ , but rather to provide disincentives for the businessman to offer bribery.

Recall that, in this scenario, the corruptor ought to bribe the player with the smaller payoff  $\omega$  as he triggers the larger domino effect and minimizes his costs of bribery. On the other hand, he ought to bribe the player with the larger chain reaction of increases in productivities (who has the larger  $\lambda_C$  and/or larger  $\omega$ ) as by doing so, he generates a stronger multiplying effect for his payoffs. In order to create an incentive gap for the corruptor, the Constitution should set the payoffs such that the player that triggers the larger domino effect induces a weaker chain reaction of productivities, so as to make the private transfer that generates high payoffs costly and the one that minimizes the costs unrewarding<sup>17</sup>.

When efforts are substitutes in the public project but complements in the private one, player  $i$ 's payoff decreases in his co-worker's productivity in the public project. Since  $j$ 's productivity is reduced when  $i$  exerts the effort in the substitution case, we would like to offer  $i$  less incentives to increase the probability of achieving the high outcome<sup>18</sup>. Player  $i$ 's payoff however should increase in  $j$ 's productivity in the businessman's project. In this scenario, the corruptor ought to target the player with the larger  $\omega$  as he generates both a smaller counter effect on his co-worker and a stronger chain reaction of productivities. The Constitution should choose this better paid agent to be the relatively least productive player for the private project as to maximize the amount of bribe needed to divert the

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<sup>17</sup>Note that  $\omega^P + \omega^A = 1$  in this case, so any factor that increases  $\omega^{i*}$  reduces  $\omega^{j*}$ .

<sup>18</sup>An example would be that of two agents exerting a somehow similar task, which is widespread in inefficient bureaucracies.

efforts of the highly productive player and reduce the corruptor's incentives for offering bribery.

### 3.4 Conclusion

This paper studies the mechanics of corruption in teams whereby a player, taking into account the fact that his decision is interdependent with that of his co-worker, is more prone to bribery. The question of which player an outside corruptor chooses to bribe is discussed and the optimal incentives design that should be considered to create disincentives for the corruptor are discussed. Our main finding is that *it is easier to corrupt a player working in a team than it is to corrupt a single player, whether the efforts within the team are complements or substitutes and given any distributional form for players' corruptibilities*. Furthermore, this vulnerability to corruption increases in both the degree of substitutability and complementarity of efforts in the uniform distribution case. When efforts are complements, bribery offered to one player has a domino effect on the whole team in the sense that not only does it reduce the incentives to exert the effort for the player who receives it, but also those of the other players in his team. This finding provides a *strategic* explanation to the "epidemic corruption" or "self-enforcing" corruption discussed in the political economy literature.

According to this paper, it is possible that, within a given government, agencies have tendency to shirk not because they can accept bribery without being caught or because they are simply used to dealing with corrupt people that it became the norm, but simply because their efforts are interdependent with some other agencies who are known to be corrupt. So the rational strategic response would be to shirk, even without being corrupt. It takes only one player to be corrupt in order to trigger a spreading corruption effect for all the others. Our analysis uncovered an interesting implication of corruption when efforts are substitutes. In this case, bribing one player reduces his incentives to work, but increases those of his co-worker. Bribery may actually have the interesting effect of re-allocating the incentives among players, thus raising the question of whether a certain level of corruption should be tolerated.

In order to derive corruption-proof payoffs, we considered the corruptor's perspective and analyzed his choice of bribery. We found that the bribe is cost-minimizing when given

to the less-paid player in the case of complementarity, and to the better-paid when efforts are substitutes. At first glance, this result may seem straightforward since it is usually the player with the lowest payoff that is more vulnerable to corruption. We present however a different explanation for this: the domino effect of a bribe is larger when it is given to the less-paid player because it then induces a strong response from his co-worker, with the relatively higher payoff, who becomes less likely to exert the effort, and hence the gain at stake from the complementarity in the public project falls and so do both players' incentives to exert the effort. In the substitutability case, bribe is given to the well-paid player in order to induce the lowest *counter effect* on the other player's effort (who is less-paid and hence less responsive to his co-worker's choice) that would need to be offset by another bribe given to the latter, should the corruptor wish to divert both players' efforts.

The implications of our analysis for the design of agencies within the government can be summarized as follows. Making the production process of the public projects or goods highly dependent on the coordination between the different government agencies, such as in highly bureaucratic systems, yields high returns if this coordination is successful. Given the possibility of bribery (lenient rules, weak supervision..), high degrees of complementarity are not recommended. Furthermore, the nature as well as the degree of interdependence of efforts should be backed up by the adequate corruption-proof incentives for the agents. Our conclusions also speak to larger questions of anti-corruption policies when the efforts of the major players in the government institutions are strategically dependent. When dividing the tasks among different players, the Politicians and the Government Administration for instance, this needs to be done in a way that ensures the highest degree of complementarity between their efforts, since this reduces the tendency for both players to accept bribery but only if both the Politicians and the Bureaucrats have a low tendency for corruption; for instance if they are known to be honest, have been selected in those specific positions for their reputation.

Otherwise, it is better to avoid the risk of a domino effect occurring by making the two players' tasks strategic substitutes. Intuitively, if we know the Administration is easily corrupted, we should not make its effort crucial for the implementation of a certain public project, the government needs to "leave itself an out" by putting in place another agency capable of implementing such project without the Administration help. Making efforts substitutes here can be seen a form of *hedging* against the risk of corruption. Our

findings also strongly support the idea present in many countries that having independent agencies limits their vulnerability to corruption. The fact that agencies such as the Central Bank, the Environmental Protection Agency in the U.S. or other regulatory agencies in Europe are only loosely connected to others makes them less prone to the domino effect of corruption that results from the general atmosphere of mistrust.

If interdependence of efforts is required, the design of incentives for the different actors should take into account the possibility of corruption and its exact mechanics. When efforts are complements in both the governmental project and the corruptor's private business, each player's productivities in both ventures need to be taken into account. This perhaps explains the persistence of bribery in many economies: when the importance of the agent to the corruptor is neglected, the latter becomes an easy prey for bribery as he does not receive the correct *corruption-proof* payoff and the corruptor ought to find bribery less costly than it should. When setting the payoffs of the different agents, it is not only what their tasks add to the governmental project that should determine their payoff, but also to which extent his efforts would be of use for a potential briber.

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## Abstract

What is Corporate Social Responsibility (CSR) and can it be demand-driven? Is there a business case for corporates providing the public good or should it be solely provided by the government? Are green products *over-priced* and should they be taxed? If they are, who are the beneficiaries and who are the actual tax payers? Will results differ whether the CSR investments in question complement or substitute for the government provision of public goods? Chapter 1 of this Ph.D. dissertation will address these questions and create a conceptual framework for further analysis in subsequent chapters of CSR as a *desirable* activity whereby firms provide a public good alongside the private good they produce. One of the main issues that emerge from this analysis is the need to identify and explore a new kind of dichotomy, i.e. the trade-off between market provision of public goods via CSR and its public counterpart via the government. This question gains particular importance in the context of developing countries, as well as in some developed ones, where firms have strong political ties. In Chapter 2, it is shown that politically connected firms – or, at extreme, the *business politicians* - may try to influence the government to reduce its provision of the public good to maximize the *reputational return* on their CSR investments. The mechanism goes as follows. An underprovided public good offers the opportunity for large political benefits to firms stepping in the areas where the government fails to deliver through their CSR activities. Consumers are suspicious about the true motives for which firms engage in CSR, it may be out of benevolence or political greed, however, since all firms, including the greediest and the most prosocial ones participate, politics interfering with business does not spoil firms' image since those political benefits are so large that everyone does it. We refer to this phenomenon as *corruption becoming a social norm*. Chapter 3 provides a strategic explanation for this phenomenon of corruption being epidemic in the economy. It explains why corruption, in the form of bribe-taking, may become widespread among government agencies, for the mere reason that their efforts are interdependent.

*Keywords:* Corporate Social Responsibility, Elite, Public Good, Corruption, Lobbies, Regulation.

## Résumé

Qu'est-ce que la Responsabilité Sociale des Entreprises (RSE) et peut-elle être induite par la demande ? Le fait de fournir un bien public est-il rentable pour les entreprises ou ces biens devraient-ils être exclusivement fournis par l'Etat ? Les produits verts sont-ils excessivement chers et devraient-ils être taxés ? Une fois la taxe imposée, qui seront les bénéficiaires et qui paiera effectivement la taxe ? En quoi les résultats dépendent-ils de la complémentarité ou substituabilité entre l'investissement en RSE en question et le bien public fourni par l'Etat ? Le chapitre 1 de cette dissertation répond à ces questions et crée un cadre conceptuel pour approfondir l'analyse, dans les chapitres suivants, de la RSE en tant que pratique désirable par laquelle les entreprises fournissent un bien public à côté du bien privé qu'elles produisent. Une des questions qui émergent de l'analyse est le besoin d'identifier et d'explorer une nouvelle forme de dichotomie qui est l'arbitrage entre la fourniture du bien public par le marché via la RSE et sa fourniture à travers l'Etat. Cette question est très intéressante dans le cas des pays en développement, mais aussi des pays développés, où les entreprises ont des liens politiques importants. Le chapitre 2 montre que les entreprises ayant des liens politiques – ou, dans le cas extrême, les hommes d'affaire-politiciens - sont en mesure d'influencer le gouvernement pour réduire le niveau de bien public qu'il fournit afin de maximiser le *rendement réputationnel* de leur investissement en RSE. Le mécanisme est le suivant. Un niveau de bien public insuffisant fourni par l'Etat offre des gains politiques importants pour les firmes qui contribuent à ce bien à travers leurs activités de RSE pour corriger la défaillance de l'Etat. Les consommateurs se méfient alors des vraies motivations des entreprises derrière ces activités, elles pourraient résulter de leur *bienfaisance* mais aussi de leur *cupidité politique*. Toutefois, comme toutes les entreprises, y compris les plus bienfaitantes et les plus opportunistes, participent, le fait qu'affaires et politique interfèrent ne détériore pas la réputation des participants à la RSE puisque ces gains politiques sont tellement importants que tout le monde s'y engage. La *corruption devient socialement acceptable* dans le sens où elle n'est pas sanctionnée en termes de réputation. Le chapitre 3 fournit une explication stratégique du phénomène de la corruption devenant épidémique dans une économie. Il explique pourquoi la corruption, sous forme de prise de pot-de-vin, peut se répandre entre les différentes agences du gouvernement sous le simple effet de l'interdépendance de leurs efforts.

*Mot-clés* : Responsabilité Sociale des Entreprises, Elite, Bien Public, Mélange des genres, Corruption, Lobbies, Régulation.