An example of conflicts of interest as pandering disincentives

Chiba, Saori; Leong, Kaiwen

2015

Chiba, S., & Leong, K. (2015). An example of conflicts of interest as pandering disincentives. *Economics letters*, 131, 20-23.

<https://hdl.handle.net/10356/107311>

<https://doi.org/10.1016/j.econlet.2015.03.028>

© 2015 Elsevier B.V. This is the author created version of a work that has been peer reviewed and accepted for publication by *Economics Letters*, Elsevier B.V. It incorporates referee's comments but changes resulting from the publishing process, such as copyediting, structural formatting, may not be reflected in this document. The published version is available at: [Article DOI: <http://dx.doi.org/10.1016/j.econlet.2015.03.028>].

Downloaded on 26 Apr 2023 22:45:56 SGT

An Example of Conflicts of Interest as Pandering Disincentives

Saori Chiba* and Kaiwen Leong[†]

Current draft: January 2015

Abstract

Consider an uninformed decision maker (DM) who communicates with a partially informed agent through cheap talk. DM can choose a project to implement or the outside option of no project. Unlike the current literature, we show that if there exists multiple dimensions of conflicts of interests between a single agent and a single receiver (DM), an increase in the conflict of interest in one dimension may actually improve cheap talk communication given that it acts as a countervailing force to conflicts of interest in other dimensions.

Keyword: Cheap Talk. Conflicts of Interest. Pandering.

JEL Codes: D82, D83, M10.

*Università Ca' Foscari Venezia, Department of Management, San Giobbe, Cannaregio 873, 30121 Venezia, Italy. Tel.: +39-3337123367. Email: saori.chiba@unive.it.

[†]Corresponding author. Nanyang Technological University, Division of Economics, 50 Nanyang Avenue, Singapore 639798, Singapore. Tel.: +65-96278873. Email: kleong@ntu.edu.sg.

Highlights

- A partially informed agent communicates his information about the state of the world via cheap talk to an uninformed decision maker (DM).
- DM can either choose a project (state dependent) or the outside option (state independent).
- If there are ex-ante conflicts of interest over projects and over the outside option between DM and the agent, those ex-ante conflicts of interest will act as countervailing forces.
- An increase in conflicts of interest in one dimension may improve cheap talk communication.

1 Introduction

A key problem in organizations is that a decision maker (DM) must often rely on a privately informed agent, whose interests may differ from that of DM. Unlike the current literature, we consider the following setting: there is potentially two-dimensional conflict of interest between a single DM and a single agent. The first dimension of conflict, an agent's pandering incentive, is similar to the one considered by Che, Dessein and Kartik (2013), hereafter CDK. The second dimension of conflict, conflict of interest over projects, is closer to the one in Crawford and Sobel (1982), hereafter CS. A single project will succeed and benefit both DM and the agent, and the other projects will fail. However, both players' ex-ante rankings of projects (based on common prior) may not coincide because their benefits from a successful project may not coincide. The agent is only imperfectly informed about which project will succeed, and he recommends a project to DM using cheap talk. DM decides whether any project should be undertaken. We show that an increase in the conflict of interest in one dimension can improve cheap talk communication given that it acts as a countervailing force to conflict of interest in the other dimension.

Our model and CDK's appendix E.2 both involve two dimensions of conflict of interest. Our two dimensions of conflicts of interest—the interaction of conflicts of interest over the outside option and ex-ante preferred projects—act as countervailing forces against one another and makes information transmission non-monotonic with conflicts of interest while CDK's—"conflicts of interests over conditionally better looking" projects and the outside option—do not.

In CDK, a perfectly informed agent is willing to recommend a project against his bias so that his recommendation looks credible. In our model, when the information is noisy, an imperfectly informed agent is not willing to recommend a project against his bias. The smaller conflict of interest, the agent more easily persuades DM to accept his recommendation.¹

¹In CDK, "it (conflict of interest) counteracts the agent's preference bias" (CDK's online appendix, page 28) means that DM's marginal benefit from introducing pandering is not monotonic with conflict of interest over projects. It does not mean that information transmission (and hence DM's absolute benefit) is non-monotonic with conflict of interest over projects.

2 Model

There is an uninformed DM and a partially informed agent. In addition, there are two projects—project 1 and 2. There are two states of nature $\theta \in \{1, 2\}$, which are equally likely. DM decides whether to carry out a project, $P \in \{1, 2\}$, or no project (the outside option), $P = \emptyset$. A project which is carried out will succeed and deliver predetermined benefit to both players if $P = \theta$; else, it will fail and deliver zero benefit to both players.

Both players are risk-neutral, and both seek to maximize profits. When project 1 (project 2) is carried out and succeeds, every player obtains benefit 1 (DM and the agent obtain benefit $x \in (0, 1)$ and $t \in (0, \infty)$, respectively). Neither player obtains any benefit otherwise. Their ex-ante rankings over projects coincide if $t < 1$ and do not coincide otherwise.²

Carrying out a project entails a non-transferable cost c to DM. c is uncertain ex-ante. Before making a decision, DM privately learns c , which is drawn from a uniform distribution with support $[0, 1] \subset \mathbb{R}$.³

In summary, DM's payoff is given by:

$$U^{DM}(P, \theta, c) = \begin{cases} 1 - c & \text{if } P = \theta = 1 \\ x - c & \text{if } P = \theta = 2 \\ -c & \text{if } P \in \{1, 2\} \text{ and } P \neq \theta \\ 0 & \text{otherwise.} \end{cases} \quad (1)$$

Agent's payoff is given by:

$$U^{agent}(P, \theta) = \begin{cases} 1 & \text{if } P = \theta = 1 \\ t & \text{if } P = \theta = 2 \\ 0 & \text{otherwise} \end{cases} \quad (2)$$

Both players' payoff functions, parameters x and t , and the distribution of c are common knowledge.

The agent privately observes a binary signal $\sigma \in \{1, 2\}$ such that $\sigma = \theta$ with probability $\alpha \in (\frac{1}{2}, 1)$, and $\sigma \neq \theta$ otherwise. Signal precision α is common knowledge. σ is not observed by DM; it is soft and unverifiable information. After observing σ ,

²DM ex-ante prefers project 1 to project 2.

³In part E.3 of their online appendix, CDK also considered a stochastic outside option (DM has private information on it) and showed that pandering still exists.

the agent sends a message $m \in \{1, 2\}$, and DM observes m without noise.⁴ Communication is costless for both players.

The timeline is as follows.

1. Nature chooses the state $\theta \in \{1, 2\}$.
2. The agent privately observes a signal $\sigma \in \{1, 2\}$.
3. The agent sends a cheap talk message $m \in \{1, 2\}$ to DM.
4. DM privately learns the cost $c \in [0, 1]$.
5. DM decides whether to carry out a project, $P \in \{1, 2\}$, or no project, $P = \emptyset$.
6. The payoffs are realized for both players. The game ends.

We study perfect Bayesian equilibria. Let $\beta^*(\sigma)$ denote the probability that the agent sends $m = \sigma$ given σ . Let

$$\mu^*(m) := \Pr(\theta = m | m, \beta^*), \quad (3)$$

this is DM's posterior belief given m and β^* . Let $P^*(c, m)$ denote DM's strategy given m and c .

Without loss of generality, we assume:

$$\Pr(\theta = i | m = i, \beta^*) \geq \Pr(\theta = i | m = j, \beta^*) \quad (4)$$

for $i, j \in \{1, 2\}$ and $i \neq j$. This is equivalent to $\mu^*(m) \geq \frac{1}{2}$ for any m .

We also assume $\beta^*(1) = 1$ and $\beta^*(2) = 0$ (the agent always sends $m = 1$) in an equilibrium where there is no information transmission.

We define four types of equilibria.

Definition 1 *In a truthful equilibrium (T), $\beta^*(\sigma) = 1$ for any σ and $P^*(c, m) \in \{m, \emptyset\}$ for any m . In a pandering-toward-1 equilibrium (P1), $\beta^*(1) = 1$, $\beta^*(2) \in (0, 1)$ and $P^*(c, m) \in \{m, \emptyset\}$ for any m . In a pandering-toward-2 equilibrium (P2), $\beta^*(1) \in (0, 1)$, $\beta^*(2) = 1$ and $P^*(c, m) \in \{m, \emptyset\}$. In a zero equilibrium (Z), $\beta^*(1) = 1$, $\beta^*(2) = 0$ and $P^*(c, m) \in \{1, \emptyset\}$ for any m .*

⁴If the message set includes at least two elements (the number of states), the result remains unchanged.

In T, the agent sends $m = \sigma$, and DM carries out what the agent recommends if the benefit exceeds the cost. In P1 (P2), the difference from T is that the agent partially reveals $\sigma = 2$ ($\sigma = 1$) by mixing between two messages. In Z, the agent does not reveal any information, and DM never selects project 2. In this paper, we sometimes call T, P1 and/or P2 *informative equilibria*.

3 Pandering Disincentives

3.1 Preliminaries

First we fully characterize equilibria for every set of parameters.

Proposition 1 *Fix any x . Define:*

$$A_1(t, x) := \left\{ \alpha \in \left(\frac{1}{2}, 1 \right) : \frac{tx\alpha^2}{1-\alpha} = \frac{1}{2} \right\}.$$

$$A_2(t, x) := \left\{ \alpha \in \left(\frac{1}{2}, 1 \right) : \frac{\alpha^2}{tx(1-\alpha)} = \frac{1}{1+x} \right\}.$$

Then, for $t < 1$, T exists if:

$$\alpha \in \left[\frac{1}{1+xt}, 1 \right),$$

and P1 exists if:

$$\alpha \in \left(\max \left\{ A_1(t, x), \frac{1}{1+x} \right\}, \frac{1}{1+tx} \right).$$

For $t \geq 1$, T exists if:

$$\alpha \in \left[\max \left\{ \frac{1}{1+x}, \frac{tx}{1+tx} \right\}, 1 \right),$$

and P2 exists if:

$$\max \left\{ A_2(t, x), \frac{1}{1+x} \right\} < \frac{tx}{1+tx} \text{ and } \alpha \in \left(\max \left\{ A_2(t, x), \frac{1}{1+x} \right\}, \frac{tx}{1+tx} \right).$$

Z exists for any t and α . No other equilibrium exists. Further, both players are better-off in the informative equilibrium (if it exists) than in Z.

Proof. See Appendix. ■

Figure 1 shows Proposition 1.

Figure 1: Equilibrium (given $x=8$)

We sketch the proof. Given σ , the agent's updated belief is $\Pr(\theta = \sigma | \sigma) = \alpha$. Given m , DM's updated belief is $\mu^*(m) \in [1/2, \alpha]$ from (4).

DM's decision is decomposed into two steps. In the first step, given m , DM compares the two projects. We say DM *selects* project 1 (project 2) if DM expects project 1 (project 2) to be more profitable than project 2 (project 1) based on his updated belief. Given $m = 1$, DM selects project 1 because of his ex-ante bias. However, given $m = 2$, DM selects project 2 only if:

$$\underbrace{x \cdot \mu^*(2)}_{\substack{\text{DM's expected benefit} \\ \text{from project 2}}} \geq \underbrace{1 \cdot (1 - \mu^*(2))}_{\substack{\text{DM's expected benefit} \\ \text{from project 1}}}, \quad (5)$$

and selects project 1 otherwise. In the second step, DM carries out the selected project if its expected benefit exceeds the cost c .

The agent reveals his information only if (5) holds. Suppose (5) holds. Given $\sigma = 1$, the agent sends $m = 1$ only if:

$$\underbrace{1 \cdot \alpha}_{\substack{\text{Agent's expected} \\ \text{benefit from} \\ \text{project 1}}} \cdot \underbrace{1 \cdot \mu^*(1)}_{\substack{\text{Probability that} \\ \text{DM carries out} \\ \text{project 1}}} \geq \underbrace{t \cdot (1 - \alpha)}_{\substack{\text{Agent's expected} \\ \text{benefit from} \\ \text{project 2}}} \cdot \underbrace{x \cdot \mu^*(2)}_{\substack{\text{Probability that} \\ \text{DM carries out} \\ \text{project 2}}}. \quad (6)$$

Given $\sigma = 2$, the agent sends $m = 2$ only if:

$$\underbrace{t \cdot \alpha}_{\text{agent's expected benefit from project 2}} \cdot \underbrace{x \cdot \mu^*(2)}_{\text{Probability that DM carries out project 2}} \geq \underbrace{1 \cdot (1 - \alpha)}_{\text{agent's expected benefit from project 1}} \cdot \underbrace{1 \cdot \mu^*(1)}_{\text{Probability that DM carries out project 1}}. \quad (7)$$

In T, DM carries out a recommended project with a higher probability given $m = 1$ than given $m = 2$. Hence, the agent's incentive to send $m = 1$ in order to increase the probability of DM carrying out a project is interpreted as a *pandering incentive*.

On the other hand, the agent's *ex-ante bias* tempts him to hide information against his ex-ante preferred project. Thus, for $t < 1$ ($t \geq 1$), the agent may want to hide $\sigma = 2$ ($\sigma = 1$), i.e., (7) can bind ((6) can bind).

Unless (5) holds, DM selects project 1 regardless of m . Hence, the pandering incentive leads the agent to always send $m = 1$ and reveal no information.

As a result, an informative equilibrium exists only when α is large. When α is small, information revelation is prevented because of the ex-ante bias and the pandering incentive.

3.2 Main Results

We show that information revelation (and welfare) is not monotonic with conflict of interest over projects.

We focus on an informative equilibrium if it exists because it makes both players better off than Z fixing parameters (see Proposition 1).⁵

Equilibria are compared based on Blackwell informativeness in terms of *garbling* (Blackwell, 1953).⁶

Proposition 2 *Fix any x and α . Information revelation is not monotonic with $|x - t|$. Moreover, each player's ex-ante expected payoff is not monotonic with $|x - t|$.*

Proof. See Appendix. ■

Figures 2 and 3 show Proposition 2.

⁵CDK focused on an equilibrium with the largest probability of implementation of each project.

⁶We say that at least as much information is revealed given $(\bar{\beta}(1), \bar{\beta}(2))$ as $(\beta(1), \beta(2))$ if $(\beta(1), \beta(2))$ is a garbling of $(\bar{\beta}(1), \bar{\beta}(2))$ (i.e., $\bar{\beta}(\sigma) \geq \beta(\sigma)$ for every σ). If neither is a garbling of the other, informativeness is not comparable.

Figure 2: Equilibrium (given $\alpha = .7$)

Figure 3: Ex-ante expected payoffs (given $\alpha = .7$ and $x = .6$)

A solid (dashed) line represents the ex-ante expected payoffs of DM (the agent) divided by his payoffs in Z.

Intuition is as follows: If $t < 1$ (both players' ex-ante rankings coincide), the agent's pandering incentive as well as his ex-ante bias tempts him to hide $\sigma = 2$.

If $t \geq 1$ (their ex-ante rankings do not coincide), the agent's ex-ante bias and his pandering incentive now countervail each other: his ex-ante bias tempts him to hide $\sigma = 1$, but his pandering incentive encourages information revelation. His pandering incentive tempts him to hide $\sigma = 2$, but his ex-ante bias encourages information revelation.

Finally, we consider a model without the outside option and compare the result with Proposition 1. An informative equilibrium exists only for $(1 - \alpha) / \alpha < \min \{x, t\}$ (T exists if $t < \alpha / (1 - \alpha)$, and P2 exists otherwise). As shown in CDK's

online appendix E.2, DM's benefit from introducing the outside option is not monotonic with $|t - x|$. Furthermore, the outside option can facilitate information transmission.

4 Conclusion

We have studied a cheap talk model with the two dimensions of conflict of interests that countervail each other. The main result is that the presence of an outside option can incentivize an agent to pander to DM's interest, but countervailing conflicts of interest can reduce the agent's pandering incentive and thus enable DM to make better informed decisions.

Appendix

Proof of Proposition 1

In every informative equilibrium, from (4) and (5), $\mu^*(1) \in [1/2, \alpha]$ and $\mu^*(2) \in [1/(1+x), \alpha]$ hold, and hence $\alpha \geq 1/(1+x)$ holds.

Consider $\alpha \geq 1/(1+x)$ from now on. Given $t < 1$, from (7), T exists iff $\alpha \geq 1/(1+tx)$. In P1, the agent is indifferent between two messages given $\sigma = 2$:

$$\mu^*(1) = \frac{tx\alpha^2}{1-\alpha}.$$

($\beta^*(2)$ is set so that this $\mu^*(1)$ equals DM's consistent belief.) From $\mu^*(1) \in [1/2, \alpha]$, α 's bounds for P1's existence are well defined.

Given $t \geq 1$, from (6), T exists iff $\alpha \geq tx/(1+tx)$. In P2, the agent is indifferent between two messages given $\sigma = 1$:

$$\mu^*(2) = \frac{\alpha^2}{tx(1-\alpha)}.$$

From $\mu^*(2) \in [1/(1+x), \alpha]$, α 's bounds for P2's existence are well defined.

The claim that every player prefers an informative equilibrium to Z is verified by comparing each player's ex-ante expected payoffs for different types of equilibria:

	T	P1	P2	Z
DM's payoffs	$\frac{\alpha^2(1+x^2)}{4}$	$\frac{(2-\beta^*(2))\mu^*(1)^2+\beta^*(2)\alpha^2x^2}{4}$	$\frac{(2-\beta^*(1))\mu^*(2)^2x^2+\beta^*(1)\alpha^2}{4}$	$\frac{1}{8}$
Agent's payoffs	$\frac{(1+tx)\alpha^2}{2}$	$\frac{tx\alpha^2}{2(1-\alpha)}$	$\frac{\alpha^2}{2(1-\alpha)}$	$\frac{1}{4}$
		$\mu^*(1) = \frac{tx\alpha^2}{1-\alpha}$	$\mu^*(2) = \frac{\alpha^2}{tx(1-\alpha)}$	
		$\beta^*(2) = \frac{2\mu^*(1)-1}{\mu^*(1)-1+\alpha}$	$\beta^*(1) = \frac{2\mu^*(2)-1}{\mu^*(2)-1+\alpha}$	

Proof of Proposition 2

From Proposition 1, fixing α , T exists if:

$$x \geq \frac{1-\alpha}{\alpha} \text{ and } t \in \left[\frac{1-\alpha}{x\alpha}, \frac{\alpha}{x(1-\alpha)} \right].$$

P1 exists if:

$$x \geq \frac{1-\alpha}{\alpha} \text{ and } t \in \left(\frac{1-\alpha}{2x\alpha^2}, \frac{1-\alpha}{x\alpha} \right).$$

P2 exists if:

$$x \geq \frac{1-\alpha}{\alpha} \text{ and } t \in \left(\frac{\alpha}{x(1-\alpha)}, \frac{(1+x)\alpha^2}{x(1-\alpha)} \right].$$

Z exists for any t and x . No other equilibrium exists.

From Blackwell informativeness (*garbling*), T is more informative than P1 (P2), which is more informative than Z. Hence, information revelation (and welfare) is not monotonic with $|x - t|$ (e.g., $t = x$ does not always result in T).

References

- [1] Blackwell, David (1953). Equivalent Comparisons of Experiments. *Annals of Mathematical Statistics*, 24(2): 265-72.
- [2] Che, Yeon-Koo, Wouter Dessein, & Navin Kartik (2013). Pandering to Persuade. *American Economic Review*, 103(1): 47-79.
- [3] Crawford, Vincent, & Joel Sobel (1982). Strategic Information Transmission. *Econometrica*, 50(6): 1431-51.

Acknowledgement

We are grateful to Faruk Gul and Barton Lipman for their guidance and patience throughout the entire project. We thank Atanu Bandyopadhyay, Marco Battaglini, Roland Bénabou, Patrick Bolton, Sylvain Chassang, Sambuddha Ghosh, Hideshi Itoh, Navin Kartik, Michael Manove, Andrew Newman, Juan Ortner and Esteban Rossi-Hansberg for comments that led to the improvement of this paper. We also thank seminar participants at the 67th European Meeting of the Econometric Society, Boston University, Hitotsubashi University, Nanyang Technological University, and Princeton University for helpful suggestions. Research assistance by Gabriel Goh, Jian Nan, Elaine Leong and Wan Wai Leong is gratefully acknowledged. This paper is a substantially revised version of an earlier paper entitled "Managerial Economics of Cheap Talk" (Chiba and Leong, 2013). All remaining errors are our own.