Gender, Risk, and Corruption
— Insights from an Experimental Analysis[1]

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Abstract

This paper tries to analyze one of the most important questions of a person's life "What circumstances leads to an individual's risky behaviour?" Basically, this paper wants to capture the dilemma faced by the subjects on whether they should dare to take risk or play safe keeping in mind corruption. The focus is to see whether men and women behave differently when they face the same situation. In that way focusing on the gender perception towards risky behaviour. The results show that at times subjects took risk when they theoretically should not have taken and otherwise, they simply avoided any kind of risk when the results were conceived to be just the opposite. Corruption has played a significant role in this context. It can be concluded that the subjects were interested only in their final payoffs and the question of ethics simply did not arise.

1. Introduction

> *"The corruption of the best things gives rise to the worst." – David Hume*

Experimental economics in the recent years has gathered pace in its journey of practically verifying the myriad theories and propositions popularized by the economists worldwide since time immemorial. It has been found, over several experiments around the world by economists and researchers that Experimental Economics has come up with results that have kept the world of economics befuddled. Ordinary people have not always displayed an absolute disregard to selflessness and cooperative behaviour that can gain a better social outcome for the society as a whole. They have not always acted for their own benefit alone. They have shown traits of trust and reciprocity of trust, eagerness towards higher contributions for the sake of others, collective effort for a worthier result, etc. and have made economists re-think their proposed theories.

In this backdrop, it tests and analyses the human behaviour and psychology under several circumstances of risk, trust, cooperation, etc. and produces meaningful conclusions in relation to the original theories.

This in turn justifies, modifies and solidifies the entire economic structure ruling the world today. People do not always weigh alternatives after performing mathematical calculations. And the most interesting fact is that very often we have to take risk for ourselves or for our near and dear ones or for any greater cause of the society at some pivotal point of time when heaven and hell become the only two corner solutions in one's life. Very often they behave in ways that are unexpected and theoretically unjustified. Nevertheless, the world moves on with ordinary people, and not economists. The common man takes the final decision that determines the way of the world and it is this fact that has been prioritized in all Experimental Economics based studies.

When a public official puts his or her own private benefits above the interests of the general public, it is a case of corruption. When an official abuses his or her position of power for personal enrichment or to provide undue advantages to the members of his or her knit group, it is actually corruption. When a policy-maker offers monetary or non-monetary favours in exchange for political support, it is corruption. Bribery, embezzlement, clientelism, nepotism, and vote-buying are different manifestations of the same old problem. This paper makes a modest attempt and takes up one aspect of human-behaviour (by relating the issue of risk with corruption) in a realistic setup and deciphers a comprehensive meaning from the major observations that emerge. The rest of the paper is organized as follows. A brief evaluation of the select literature has been carried out in Section 2. Section 4 illustrates the game structure and the methodology employed. Section 5 puts forward the empirical results and discussions. The paper ends with a conclusion.

2. Review of Literature

It is interesting to note that experiments on corruption and corruptibility are relatively less in number and far between, with the earliest arguable work being that by Frank and Schulze (2000) and Abbink et al. (2002). Experiments that address the incentive-compatibility issues and effectiveness of anti-corruption measures in public procurement are even lesser in number, with Apesteguia et al. (2003) being the prominent example to date. But in a different context, the existing literature on gender and corruption has gathered momentum in the recent years and in this backdrop, this paper tries to find an answer to the question that whether men are more corrupt than woman. A greater part of these experiments have been conducted in the laboratory where two forms of corruption have been studied — embezzlement and bribery. Following the existing literature, this paper studies corruption in the context of bribery. The results given in Frank and Schulze (2000), as well as Rivas (2006) suggests that women on an average tend to be less corrupt as compared to the male counterparts, although Alatas et al. (2006a) is of the opinion that the effect mainly depends on socio-economic and cultural factors. Likewise, tolerance with respect to corruption may differ across cultures (Cameron et al., 2006).

Differences in responses on account of gender have been studied extensively by various experimental researchers using the "Dictator Game". To name a few, Eckel and Grossman (1998) experimented with a double blind Dictator Game. They found that women, on an average, gave away twice as much as men to the anonymously matched partners. Andreoni and Vesterlund (2001) have also experimented with the Dictator Game and found that men tend to be generous initially but over time they keep more for themselves while women have a tendency to divide the endowment more evenly throughout. But very few papers, till date, exist in relation to the issue of corruption and gender differences, with the most prominent being that Chaudhuri (2012). This paper by Chaudhuri (2012) surveys the empirical evidence on the existence of gender differences in the individuals' propensity to engage in corruption. The main focus of the discussion is in the insights provided by laboratory experiments specifically designed to test for gender differentials in corrupt transactions. The author discusses possible reasons for gender differentials in corrupt behaviour, as, risk aversion and preferences for reciprocation (Chaudhuri & Sbai,

2011). Lastly, Chaudhuri emphasizes on the fact that gender effects are more likely to be observed in developed countries and calls for further research in developing countries. This paper will try to highlight the fact that whether individuals tend to undermine outcomes that are probabilistic in nature than those which one can obtain with absolute certainty (Kahneman & Tversky, 1979). Also, do the results support that foregone gains are less painful than supposed losses?

3. Objective of the Paper

Corruption has now become universal. The fact of the matter lies that to indulge in corrupt activities not only a fearless disposition of the mind is required, but also a collection of dire necessities that instigates them to do so. Corruption in India is a major issue that has adversely affected its economy. To draw attention to the fact that many of the biggest scams since 2010 such as the 2G spectrum scam (₹1.76 lakh crore), the 2010 Commonwealth Games scam (₹70 thousand crore), the Adarsh Housing Society scam, the Coal Mining Scam (₹1.86 lakh crore), the Mining Scandal in Karnataka and the Cash for Vote scam have involved very high level government officials, bureaucrats and political persons. India had been ranked 94th out of the 177 countries in Transparency International's 2013 Corruption Perception Index (CPI) on account of the series of scams and incidents of corruption that took place in the public sector. Nevertheless, India's position has improved and in 2016 it has been ranked 79th out of the 177 countries.

In this backdrop, the main objective of this paper is to analyze the risk-taking behavior of individuals in highly uncertain and unpredictable conditions. Since corruption facilitates a huge deal of risk-tolerance, this area is the best perspective to choose for this risk analysis. The author has chosen to study the behavior of individuals when faced with two options of — asking for the bribe or not and paying the bribe asked for or not. Corruption and corruptibility due to their illegal and therefore secretive nature is indeed very difficult to assess either with the traditional tools, such as hard data on criminal convictions or soft data elicited through the opinion polls, questionnaires, or case studies. While there seems to be an agreement these days that corruption does have a negative impact on (foreign) private investment and economic growth, government revenue and infrastructure, and social equality on the macro level, it is poorly understood what exactly, on the individual level, the determinants of corruptibility are and what institutional arrangements could be used to fight (the causes of) corruption. In this paper the author has used a third, complementary mode of investigation of corruption – i.e. by designing an experimental game to address it.

Second, the focus of this paper is to see whether men and women behave differently when they face the same situation thereby focusing on the gender perception towards risk. Also, the one-shot nature of this game also helps to avoid the various issues associated with the case of repeated games, such as signaling, reputation formation and serial correlation in the decisions.

4. Game structure and Methodology

The story of the game proceeds as follows — supposing, there is an official at a local municipality borough office and a common man who is desperately trying to get the mutation (i.e. *mutation is the process of getting one's house registered in his/her own name from someone else in the books of the local Municipal Corporation. This can happen either when one buys a flat or when inherits some property*) of his house done under certain unavoidable circumstances. But the slow system shows no initiative to meet his demand. Now the official is a clever worker. He knows that he can forward the man's application in due time and get the mutation procedure completed. But then, he may also seize this opportunity and demand a bribe from the common man in exchange of the work he does for him without leading him into further harassment.

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The common man wants the mutation done at any cost and he wants it fast. So he might agree to pay the bribe and get his job done. But it may also happen that he turns out to be a very idealistic man and gets angered at the thought of paying a bribe for a rightful piece of work and simply decides to turn down the official's offer. Therefore, he decides not to pay any bribe and subsequently reports to the higher authority against the erring official. After the reporting, a high level committee is formed to investigate into the matter and decide whether the public official is at fault or not. If the official is found to be guilty of asking for a bribe (getting caught) then the common man gets his work done immediately and also gets a monetary reward for bringing the crime into their notice. But if the official is found not to be guilty of asking for a bribe (not caught), then the common man does not get his job done at all, whereas the public official gets a moral certificate as compensation for the charge brought against him.

However, these situations will not arise in the first place if the official does not want any bribe and does the work lawfully. Both get their respective benefits and bid adieu to each other. Now, the author shall describe how this game moves and what happens in each stage of the game. Following is a diagram of how this game moves.

Figure 1. The structure of the game tree
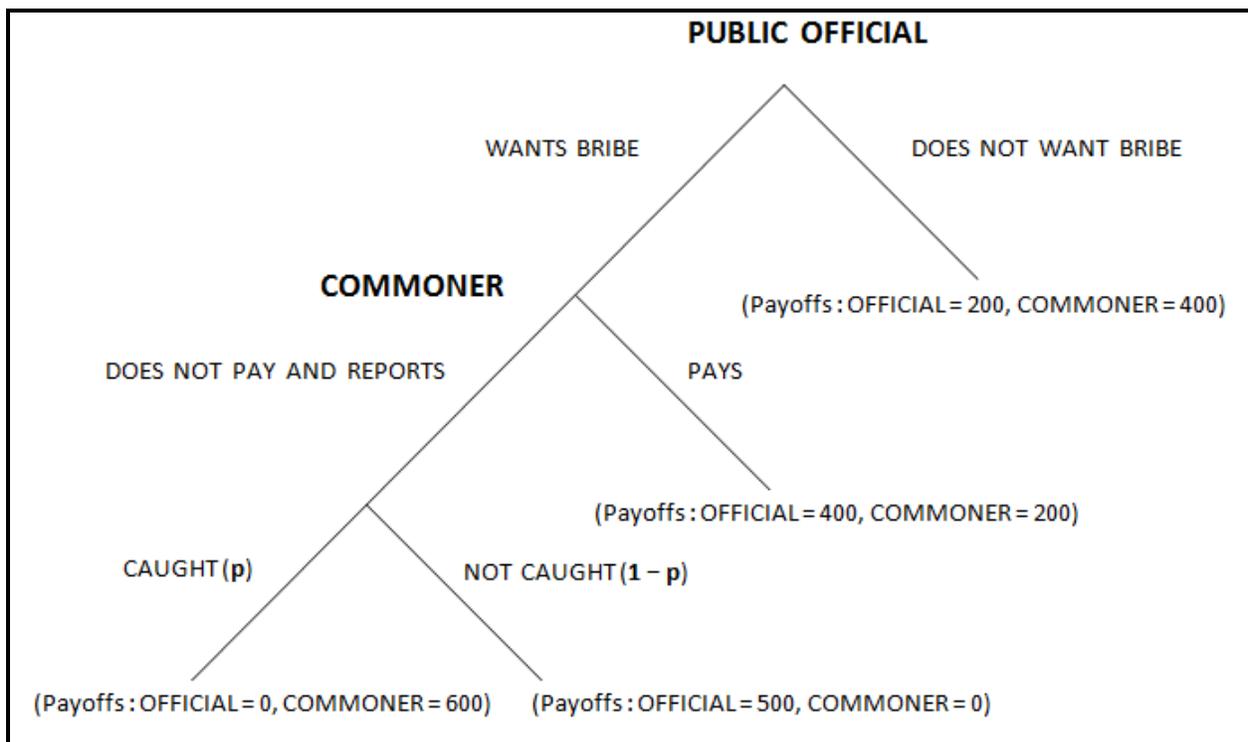
Source: Designed by the author

Here **p** is the probability of the official getting caught and **(1 − p)** is the probability of the official not getting caught.

The first stage in the structure is describing that the official has two options to choose from, that is either he can ask for the bribe or else he cannot for the work to be done. In this stage if the official does not ask for any bribe then the game ends there with the probable payoffs described below and if the official has asked for bribe then the game goes to the second stage. Now in the second stage the commoner has two options that are either he pays the bribe to the official or else he does not and subsequently report the case

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to the higher authority. When the commoner pays the bribe, the game ends there with the probable payoffs mentioned below, but if the commoner does not pay the bribe and reports it then in the same stage only there is the probability of getting caught or not getting caught after the investigation is done. After the respective actions of getting caught or not getting caught happens, the official and the commoner get their respective payoffs as described below.

The respective payoffs are described as follows:

- If the official does not ask for bribe and does the work, then he will get **200 Coupons** and the commoner will get a payoff of **400 Coupons**.

- If the official wants the bribe and commoner pays it, then official gets **400 Coupons** (400 = 200 + 200 = fees for doing the work + bribe) and the commoner will get **200 Coupons** (200 = 400 – 200 = valuation for the work done – bribe).

- But if the commoner does not pay bribe and reports, then with probability 'p' the official will get caught and with probability '1 – p' the official will not get caught. If the official gets caught, then he will get **0 Coupons** (because he has not done the work and he also gets caught) and the commoner will get **600 Coupons** (600 = 400 + 300 – 100 = work done by the higher authority's initiative + reward – cost incurred to book the official like hiring lawyers, appear before the court of law, etc.).

- If the official is not caught then he gets **500 Coupons** (suppose, which is the monetary value of the character certificate) and the commoner gets **0 Coupons** (as the official is not caught and the work is not done, so basically he gets nothing).

    The conversion rates of the coupons that used as payoffs are given as :
      200 Coupons = Rupees 40 (INR),
      400 Coupons = Rupees 60 (INR),
      500 Coupons = Rupees 80 (INR) and
      600 Coupons = Rupees 100 (INR).

This is how the subjects have been paid on whom the experiment was conducted. There was also a participation incentive fee of Rupees 10 (INR) for every participant. The subjects chosen were students of Jadavpur University, Kolkata across the three faculties, namely, Arts, Science and Engineering. There were 20 players in this game. Among them, 10 were male and 10 players were female. Since, the objective is to investigate the gender wise perception towards risk aversion — there were three situations in which the author conducted the experiment. In the first situation, the subjects were all male. In the second situation, the subjects were all female. Before conducting the mixed group case the author had to decide which 5 subjects would have to be chosen from the male group and which 5 subjects would have to be chosen from the female group. This was done based on the tossing of a coin as the idea was to pair the public officials from one group with the commoners of the other group randomly. This was done to ensure that the pairing was done between the members of the opposite sex. The following section reports the results of the experimental analysis carried out using z-Tree programming software (Fischbacher, 2007). The instruction sheet has been reported in the appendix.

5. Results and Discussion

Moving on to the analysis part, in the first session i.e. in the case of only male group, the first four pairs behaved very similarly. Both the public official and the commoner took risk and were interested in

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maximizing their expected utilities. However, in the final pair, the public official is completely risk averse. He is afraid of leaving the game without anything in hand. So he prefers the certain amount of 200 Coupons, though he could have got for sure 400 Coupons had the bribe got paid or got an expected utility of ($\frac{1}{2}*500 + \frac{1}{2}*0 = 250$ Coupons) had he taken the risk of asking for the bribe. Since the game has ended in the very first stage the risk profile of the commoner however remains unknown. There was only a single round. 8 subjects out of the 10 have taken risk in this session i.e. — 80 per cent. So, we can say for sure 80 per cent (i.e. 4 out of 5) of the public officials are corrupt while 80 per cent (4 out of the 5) of the commoners are against this idea of asking for a bribe. Majority of the commoners have reported this issue knowing fully well that they might get a zero payoff.

Coming to the case of only female group in session II, the first and second official did not go for any risk and played for the safe outcome. So the game ended in the first stage itself. The other three pairs have taken risk and we can see that even in case of the only female group, that a majority is defying the prospect theory notion of opting for the certainty outcome. The results of session I and II have been reported in table 1. It should be noted that when the public official takes risk – it is a choice between a certain outcome of 200 Coupons and he could have got 400 Coupons had the commoner paid the bribe (though an uncertain outcome) or got an expected utility of 250 Coupons had the commoner reported to the higher authority. Both these outcomes have greater payoffs than the certainty outcome. This shows that the public officials take risk and aim for higher gains. The same argument holds good for the commoner. The last pair in both sessions I and session II play the Nash equilibrium outcome of (200,400). It is very much clear from these results that expected utility hypothesis holds in our case and not the prospect theory based certainty outcome.

Table 1. A comparison of the results between the "only male" and "only female" group

Pair	Session I : Only Male Group			Session II : Only Female Group		
	Risk Taken	Expected Utility	Final Payoffs	Risk Taken	Expected Utility	Final Payoffs
1 • Public Official • Commoner	Yes Yes	250 300	500 0	No	No risk involved	200 400
2 • Public Official • Commoner	Yes Yes	250 300	500 0	No	No risk involved	200 400
3 • Public Official • Commoner	Yes Yes	250 300	500 0	Yes Yes	250 300	500 0
4 • Public Official • Commoner	Yes Yes	250 300	500 0	Yes Yes	250 300	500 0
5 • Public Official • Commoner	No	No risk involved	200 400	Yes Yes	250 300	500 0

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Source: Compiled by the author as obtained from z-Tree software

Table 2. Results of the "mixed group"

	Session III : Mixed Group		
Pair	Risk Taken	Expected Utility	Final Payoffs
1 • Public Official • Commoner	Yes Yes	250 300	500 0
2 • Public Official • Commoner	Yes Yes	250 300	0 600
3 • Public Official • Commoner	Yes Yes	250 300	500 0
4 • Public Official • Commoner	Yes Yes	250 300	0 600
5 • Public Official • Commoner	No	No risk involved	200 400

Source: Compiled by the author as obtained from z-Tree software

In the mixed group scenario, the matching happened between the male public officials and the female commoners. Being a part of the mixed group did not change the behaviour of the subjects significantly. The first four pairs took risk but the public official in the last pair played safe (Refer to table 2). Surprisingly, as per the author's observation in Session III, the behaviour of public officials of Session I is exactly similar. 80 per cent of public officials went on to ask for the bribe and 20 per cent went on to play safe. This highlights the fact the being paired with a female partner does not change the behavioural pattern of the male subjects. The differences in the gender wise risk perception among the public officials and commoners do vary. As already stated, 80 per cent of the male subjects had taken risk while it was 60 per cent in case of the female subjects. Taking risk for the public official means asking for bribe and taking risk for the commoner means not paying the bribe and then reporting this issue to the higher authority. More or less all the male public officials are risk lovers and they have taken risks no matter with whom they have been paired with. In this context, again coming to the issue of corruption, if the public official asks for the bribe it means that he/she is corrupt and if the commoner pays the bribe asked for it implies that he/she favours corruption. It is interesting to note that this analysis did not find any commoner who supported corruption i.e. paying the bribe asked for.

Going by the results obtained, it is clear that male subjects are relatively more corrupt than female subjects. Also, a clear majority (on the whole) have gone for the risky outcome which is very much in accordance with the expected utility hypothesis. If one closely observes the overall results for Session I

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and Session II, it would be clear that a clear majority, irrespective of gender (i.e. male or female) have taken a risk though taking risk has different implications for both the public official as well as the commoner.

In case of this analysis with a small sample, the indicators can be considered as the average payoff for both male and female subjects. Therefore, a 'split two sample mean difference' test can be conducted to comment on whether there is any variation in the indicator specified across the two categories. The test follows, let, the population average earning in the entirely male group be P_m and in the entirely female group be P_f. Let the sample average earning in the entirely male group be E_m and in the entirely female group be E_f.

The t statistic is given by,

$$ t = \frac{E_m - E_f}{SE_{E_m - E_f}} $$

where, E_m and E_f are sample average payoffs and m and f are the number of male and female subjects. Also, s_m and s_f are the standard deviations in the male and female group respectively.

The standard error is given by,

$$ SE_{E_m - E_f} = \sqrt{\left(\frac{(m-1)s_m^2 + (f-1)s_f^2}{m+f-2} \right) \times \left(\frac{1}{m} + \frac{1}{f} \right)} $$

The null hypothesis of $H_0 : P_m - P_f = 0$ against the alternative hypothesis of $H_a : P_m - P_f \neq 0$

Table 3. The split sample mean difference test results

Standard error	$|t|$ value	Degrees of freedom	Probability > t
102.7004	0.194	18	0.58

Source: Results as obtained in Stata 12

Therefore, from table 3 the author fails to reject the null hypothesis and hence concludes that there is not much variation in the average payoffs across both the groups. The implications of this are that in 95 per cent of the cases the payoffs on an average across both the groups is almost the same. There is as such no significant variation in the average earnings across both the male and female groups or variations may be there but they are very negligible. This in fact validates what has been observed so far i.e. a clear majority prefers the 'expected utility theory' backed 'risky outcome' than the 'prospect theory' backed 'certainty outcome' and consequently earnings would be very much similar.

6. Conclusion

To sum up, the behaviour of the subjects contradicts what essentially has been predicted in the 'prospect theory' (Kahneman & Tversky, 1979). The main thrust lies in the analysis of the gender wise perception

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towards risk behaviour. It has been found that people did not behave according to a specific pattern. At times they took risk when they theoretically should not have taken and otherwise, they simply avoided any kind of risk when the results were conceived to be just the opposite. Corruption has played a significant role in this context. It should be noted that most of the public officials (in case of both male and female) were interested only in their final payoffs and the question of ethics simply did not arise. It also needs to be mentioned here, that while participating in the corrupt activities, people do not think about morality, they are bothered only about their ultimate gains. On the contrary, majority of the commoners in this game are very idealistic and are against the issue of corruption. One can criticize this paper by citing the fact that the number of subjects is less but nevertheless this novel framework can be used for further research by not only increasing the number of subjects but also by changing the geographical location where the study has been carried out. That would be worth exploring. Also, instead of matching the male public officials with female commoners one could have done the opposite by matching the male commoners with female public officials. The author, however, believes that the results would not have changed much under such a case.

Viewing the overall results, it has been observed that men tend to be more corrupt than women. The literature suggests that women and men relate to corruption quite differently due to differences in risk-taking behaviour. It is often hypothesized that women's particular role in the society, which entrusts them with the care of children and elders in the family, makes them more averse to risk. Therefore, in professional settings they are less likely to engage in corruption for fear of being caught and losing their jobs. Evidently, even though this experimental analysis has not provided us enough proof of people behaving according to the prospect theory so we may conclude that most of them are willing to take risks and aim for higher gains. Consequently, this paper does not tend to support the "Certainty Effect" proposed by Kahneman and Tversky (1979) where individuals tend to undermine probabilistic outcomes than those which are certain.

It depicts one positive feature, i.e. although the percentage of asking for bribes among the officials is very high, the percentage of commoners refusing to pay the bribe and consequently reporting this issue to the higher authority is also equally high. This quite convincing when we remind ourselves of the whole lot of corruption activities that happen in our country and the following upheavals that shake the system every now and then.

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Appendix

Instruction Sheet (used in z-Tree Programming)

I welcome you to a session of experiments in Economics.

Moving on to the experiment, the **story** goes as follows:

Suppose there are two individuals. One is a public official at a local municipality office and the other is a common man who is trying to get the mutation of his house done under certain unavoidable circumstances.

[*Mutation is the process of getting your house registered in your own name from someone else. This happens in the case when you purchase a flat or when you inherit some property.*]

The common man applies for mutation and goes to the public official.

The public official has two choices:
- He can either follow the normal procedure and thereby do his duty against his salary, OR
- He can demand a bribe without which he might not be willing to do this particular job and unnecessarily delay the work for an infinite time.

Now the commoner can either
- pay the bribe,
  OR

- reject paying the bribe and register a complaint in the higher authority against the erring public official for demanding the bribe.

After the reporting is done, a high level committee is formed to investigate into the matter and decide whether the official is at fault or not.

If the official is found to be guilty of asking for a bribe **(getting caught)** then the common man gets his work done immediately and also gets a reward for bringing the act into their notice. But if the official is found not to be guilty of asking for a bribe **(not caught),** then the common man doesn't get his job done at all, whereas public official gets a moral certificate as compensation for the charge brought against him.

However, these situations will not arise at all in the first place if the official doesn't want any bribe and does the work lawfully. Both get their respective benefits and bid adieu to each other.

Following is a diagram of how this game moves. This will make the picture clearer.

The Game-tree:
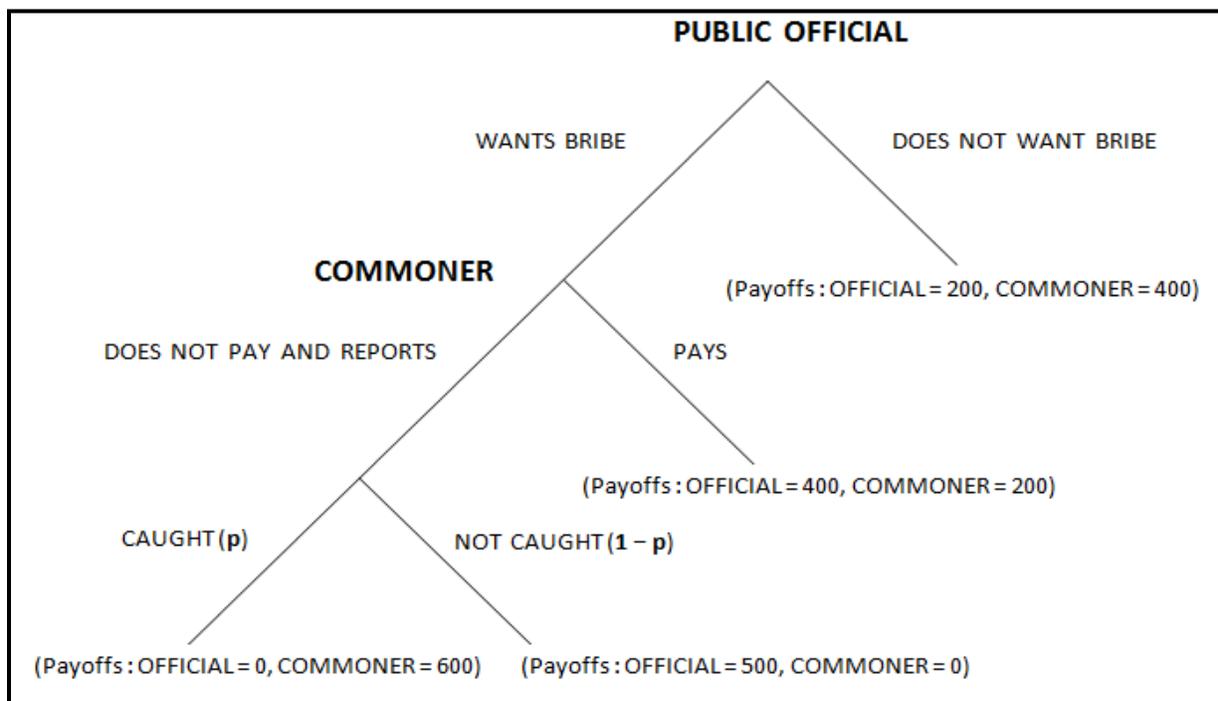
Here **p** is the probability of the official getting caught and **(1-p)** is the probability of the official not getting caught.

Follow this structure and observe the payoffs….

Please Note:

- In each round you will be paired with one other player in this room and the computer will arbitrarily choose one of you as the public official and the other as the common man.

- There will be three situations in which this experiment will be conducted. Therefore,
  1) You may be a part of an **entirely male group**.
  2) You may be a part of an **entirely female group.**
  3) You may be a part of a **mixed group.**
  You will be informed about the group to which you belong to before the start of the experiment.

- How do we determine whether the public official is caught or not ? Your computer will generate a random number on the screen. If it is less than 0.5 then the official will be caught and if it is greater than 0.5 the official will not be caught. Please write down the number that appears on your screen at the top of this sheet.

- There is a conversion rate of these Coupons $\Rightarrow$

  200 Coupons = Rupees 40 (INR),

  400 Coupons = Rupees 60 (INR),

  500 Coupons = Rupees 80 (INR),

  600 Coupons = Rupees 100 (INR).

  There is a consolation payoff for everyone of Rupees 10 (INR).

- Every time you provide your decision during the course of this game on the computer, please remember to press the "**OK**" button.

- We will be playing one practice round to help you get accustomed to this game.

- If you have any question you can ask us before the start of the experiment, but we request you not to talk amongst yourselves during the course of this experiment.

Thank you for your time and co-operation!!