

**HETEROGENEOUS TASTES IN CHARITABLE GIVING:
ANALYTICAL AND POLICY IMPLICATIONS**

BY

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**DEPARTMENT OF ECONOMICS
NATIONAL UNIVERSITY OF SINGAPORE**

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ABSTRACT

The economics of charitable giving may seem contradictory. If, according to economic theory, the rational economic man seeks to increase his utility, how then can he give gifts? Are these acts to be set aside from economics as unexplainable behaviour?

Taking the increased trend in giving as our point of departure, this paper briefly looks at the birth of the new economics of charity and its role in social sciences to answer the questions above. We observe that existing literature fails to incorporate the concepts of generosity and heterogeneous preferences. These limitations hence lead us to identify the need for a more realistic theoretical framework.

In our paper, we present not just one model, but two theoretical frameworks, to capture the essence of charitable giving. In our ‘warm glow’ framework, we adopt the existing models of charitable giving to derive a hybrid model, which allows us to clearly capture the notion of heterogeneous preferences by altruists. While studies have been done on Kantian altruism, it has mainly been conceptualised as a motivation for charitable behaviour at social level. This paper therefore contributes a new model to the study of charitable giving – one that captures Kantian altruism *at group level*.

By additionally subjecting our models to government policy in the form of compulsory transfer through taxation, we realise that some degree of taxation is recommended due to its Pareto-improving nature. For the sake of humanitarian concern and social justice, we conclude that compulsory transfer via taxation is, in some sense, a ‘necessary evil’.

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CHAPTER 1

INTRODUCTION

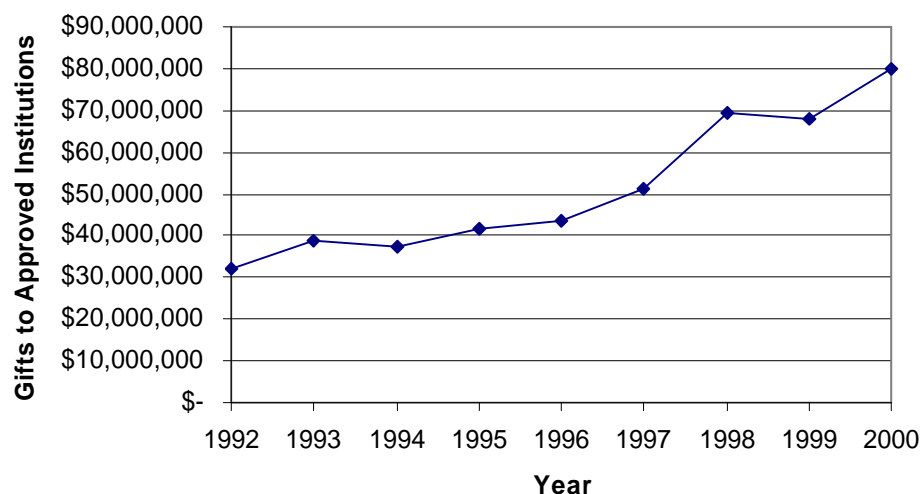
1.1 Recent Trends in Giving

In June 2002, research findings presented in the *Giving USA* Annual Report for 2001 recorded the highest level of charitable giving by Americans ever. Out of the estimated US\$212 billion in gifts to charitable institutions, US\$1.88 billion was received by the major national September 11 relief funds as of the end of 2001.¹

In Singapore, there has been an increasing trend in giving to approved institutions² with a 2.5 times increase over 8 years to almost S\$80 million since 1992.³ In 2000, the Community Chest of Singapore supported 50 charities by raising more than S\$37 million to benefit 228,000 individuals and fund 111 programmes.⁴

Figure 1.1

GIFTS TO APPROVED INSTITUTIONS IN SINGAPORE (1992-2000)



¹ Center on Philanthropy, Indiana University (2002).

² The Inland Revenue Authority of Singapore defines 'gifts to approved institutions' as:

- (a) approved gifts to an approved museum;
- (b) outright cash donation made to the government or approved Institutions of Public Character;
- (c) an amount equivalent to the value of any gift of a computer made by any company to a prescribed educational or research institution in Singapore; and
- (d) shares of public companies listed on the Singapore Exchange or units in unit trusts that are readily tradable in Singapore.

³ Table A1.1 (Appendix 1).

⁴ Ministry of Information, Communication and the Arts (2002).

These are examples of charitable behaviour whereby people freely give money to help others. One of the most challenging and apparently paradoxical aspects of individual behaviour is the observation that individuals are willing, voluntarily, to transfer their own income for the benefit of others. This type of behaviour appears to run counter to the basic tenets of economics, which sees individuals as essentially selfish, utility-maximising beings.

1.2 Objective of Study

Existing literature on the topic of charitable giving have commonly modelled giving, for simplicity purposes, on the assumption that all people have identical preferences (Andreoni, 1988). While this assumption has facilitated economists to determine the motivations for charitable giving and investigate the effects of government intervention on individual charitable giving, it does not clearly reflect reality. As such, the main concern of our paper is the failure of existing literature to address the issue of heterogeneous preferences in charitable giving.

Our paper begins with a basic review of the existing literature to develop a fundamental understanding of the economic motivations underlying the decision for charitable giving, and to help us identify some limitations of the literature to capture the true essence of giving. We then attempt to incorporate the heterogeneity of preferences in not just one model, but two theoretical frameworks, to observe its role in determining the individual's level of giving. We also subject our models to government policy in the form of compulsory transfer through taxation. This would allow us to analyse whether some degree of taxation is necessary to help improve the level of giving by individuals.

In our paper, we try to make some forays in the following areas:

- (i) The effects of heterogeneous preferences on private giving and well-being in a 'warm glow' model;
- (ii) The effects of heterogeneous preferences on private giving and well-being in a 'group Kantianism' model;

- (iii) The effects of compulsory transfer via taxation on private giving and well-being in both our ‘warm glow’ and ‘group Kantianism’ models; and
- (iv) The actual need for such a policy of compulsory transfer in reality.

1.3 Scope of Study

Chapter 2 provides a basic review of existing literature on the topic, and identifies the need to include heterogeneous preferences in the study of charitable giving. In Chapter 3, a ‘warm glow’ theoretical framework is presented to study the effects of *heterogeneous preferences* and *compulsory transfer via taxation* on the private charitable contributions and the individual’s well-being. A ‘group Kantianism’ framework is also used to study both effects in Chapter 4. Finally, Chapter 5 concludes with a discussion of our study.

CHAPTER 2

BRIEF LITERATURE REVIEW

2.1 Economics of Philanthropy, Altruism and Charity

Economics and ethics seem to be contradictory. If, according to economic theory, people seek to increase their utility, how then can they give gifts? Should these acts be set aside from economics as unexplainable behaviour? It seems ironic that an individual would work hard for his money and then turn around to give some away.

At the heart of classical economic theory lies the premise of self-interest. However, this narrow conception of the rational economic agent as a crudely calculating, self-interested, utility-maximising being is not a realistic one. The postulates of economic theory do not say that man is concerned only with himself. In reality, people may care not only about their own well-being, but also about the well-being of others.

Given this paradoxical image of man, many economists have attempted to enlarge the scope of rationality in economics. Gordon Tullock, Gary Becker, Thomas Ireland, David Johnson, James Andreoni and others in America, and Michael Cooper and Anthony Culyer amongst others in Britain, have appealed to the rationality axiom and other economic principles to explain the paradox. With their research and contributions, the economics of philanthropy, altruism and charity have shown much development since its birth in the 1970s, and continues to show potential due to its infancy.

As one of the founding fathers of the new economics of charity, Arthur Seldon best defines the significant role of this topic of economics. He noted that “[t]he new economic counter-revolution has liberated the noblest instinct of man – to help people in need by giving, charity, philanthropy – from its sociological confusion and shown it to be rational behaviour that can be analysed through micro-economics”⁵.

⁵ Seldon (1987, 8).

2.2 Definitions

For the purposes of this paper, we shall briefly review the definitions and characteristics of charitable giving. Philanthropy, or charitable giving, refers to benevolent behaviour, usually in the form of charitable gifts, towards others in society.⁶ Charitable giving is characterised by 3 properties: (a) the gifts directly or indirectly satisfy some basic needs of the recipients; (b) the recipient is not obligated to reciprocate; and (c) giving could be to a total stranger who the altruist may not likely encounter again.⁷

By giving, the altruist hence partakes in a voluntary act of charity, which confers some benefits upon others, while imposing net material costs upon himself.⁸ Moreover, since compulsion is absent, giving depends on the intensity of the desire of one individual to give to another.

2.3 Motivations for Giving

By the axiom of rationality, we should look for the determinants that motivate an individual to consider giving as the best thing to do with his sum of money at that time. A study conducted by Chua & Wong (1999) on charitable giving in Singapore provided empirical indications that the tax price of giving, as well as the disposable income, age and educational attainment of the individual, are important determinants of charitable giving.

Due to different preferences, people may favour a particular type of organisation to be the beneficiaries of their donations. Organisations that promote arts and culture, education, health, religion and social service, are always sought after by donors. Moreover, the underlying motivation for charitable giving is the individual's belief in the mission and cause of the organisation. As such, he makes charitable gifts to support the efforts of the organisation.

⁶ Andreoni (2001, 11369).

⁷ Chua & Wong (2002, 123).

⁸ Holländer (1990, 1158).

2.4 Some Limitations of Existing Literature

2.4.1 *Lack of Generosity in Altruism*

Culyer (1973, 42) pointed out that “an altruistic person is one for whom the well-being of others is of concern”. This means that the altruist assigns a positive weight to the well-being of others in his set of preferences. It, however, does not mean that he will, under any circumstance, present others with gifts. Even if the altruist desires to help others, he may not do so if he faces unfavourable material costs. The mainstream concept of altruism thus fails to accurately incorporate the idea that “altruism is concerned with tastes and preferences and not yet with action”⁹.

On the other hand, “*generosity* is a function of the environment in which a person lives as well as the degree to which he is altruistic”¹⁰. Only a generous altruist is able and willing to provide gifts to others. As such, in attempting to capture the essence of altruism in our theoretical framework, it is important to emphasise the notion of *generosity*.

2.4.2 *Lack of Heterogeneity of Preferences*

The current approach to altruism seems flawed by a basic methodological shortcoming – the assumption that the preferences of agents are identical. Although Andreoni & Miller (2002, 750) observed that individual preferences are heterogeneous, their study and existing economic literature do not take into account that preferences shape behaviour, such as the individual’s generosity. Any study that does not take explicit account of the consequences of the underlying preference on behaviour may be, to some extent, inaccurate and unrealistic as a suitable guide of future action. This paper is thus motivated by the lack of research on the effect of heterogeneous preferences on charitable giving.

⁹ Collard (1978, 8).

¹⁰ Culyer (1973, 42).

2.5 Modelling the Giving Behaviour

Using a modelling framework to represent how public goods can be supplied through voluntary activity is difficult, due to the large population of individuals and the incentive for each individual to take a free ride. In trying to model and explain this phenomenon, economists usually adopt the assumptions of utility maximisation and Nash conjectures such that each person allocates his income between private consumption and public goods so as to maximise his own utility, taking the behaviour of everyone else as given (Warr, 1982; Chua & Wong, 2002).

Over the years, economists have derived several theoretical models of charitable giving.¹¹ The two benchmark models most often used are the public goods model (Warr, 1982; Roberts, 1984; Bergstrom *et al.*, 1986) and the private consumption model (Menchik & Weisbrod, 1981; Andreoni 1998). The difference between the two models lies in the underlying assumption regarding what motivates the individual to give.

In the public goods model, economists model social well-being as a public good, because it has such characteristics as equity, shared communal benefits, indivisibility, non-rivalry and non-excludability. Social well-being covers diverse but important areas like whether the less fortunate and disadvantaged is receiving efficient and effective social services. The desire to increase such social welfare thus motivates the individual to give. As such, a charitable gift is meaningful only if it increases the supply of the public good. Economists model the utility of the altruist as:

$$(2.1) \quad U_i = U_i(c_i, G), \quad i = 1, \dots, n$$

where c_i is his private consumption, $G = \sum_{i=1}^n g_i$ is the total amount of the public good, g_i is his charitable gift and n is the total number of individuals. This implies that individual contributions are interdependent, so that giving by one altruist directly increases the utility of other altruists.

¹¹ Refer to Brown (1997) for an overview of the variety of theoretical models of charitable giving.

In the private consumption model, the act of giving itself motivates the individual to give.¹² In return, the altruist derives some internal satisfaction, labelled the ‘warm glow’ effect by Andreoni (1990), from his good deed. The utility function of the altruist is:

$$(2.2) \quad U_i = U_i(c_i, g_i), \quad i = 1, \dots, n$$

This implies that contributions are independent, in that giving by one altruist does not affect the utility of other altruists. As a result, an altruist cannot free-ride off of the gifts of others and has no incentive to cooperate with other altruists.

Economists often mix the two motivations to create probably a more realistic view of the world, in which the individual is motivated by both what their gifts produce and how giving makes them feel. Andreoni (1990) modelled such mixed motivations in his impure altruist model¹³, in which the altruist’s utility function is:

$$(2.3) \quad U_i = U_i(c_i, g_i, G), \quad i = 1, \dots, n$$

As we want to incorporate the notion of heterogeneous preferences in our study of charitable giving, our theoretical framework cannot simply be based on one of the abovementioned models. Instead, since Smith *et al.* (1995, 111) identified that individuals may be grouped into ‘low altruism’ and ‘high altruism’ people, we shall use the public goods utility function for the former individuals, and the impure altruist utility function for the latter individuals. While both groups care for the well-being of the less fortunate, the low altruism individuals are not so generous and would hardly give, except perhaps only an infinitesimal number of individuals. The high altruism individuals, on the other hand, are generous and would, more often than not, contribute to the supply of the public good.

¹² For a more focussed study, we shall not pursue the other motivations to giving, such as:

- (a) Direct personal motive, eg. tax exemption and reduction;
- (b) Broader public motive, eg. fundraising for less fortunate but deserving members of society; and
- (c) Social and psychological motive, eg. prestige, respect and friendship (Olson, 1965, 60); social acclaim, avoidance of others’ scorn (Becker, 1974, 1083); alleviation of social guilt (Menchik & Weisbrod, 1981); social approval (Holländer, 1990).

¹³ Andreoni (1990, 465) regards an individual as ‘purely altruistic’ if he does not care about his private gift, as in the case of (2.1). However, when g_i enters into his utility function twice, as in the case of (2.3), he is regarded as ‘impurely altruistic’. It may be argued that Andreoni’s use of the adjective ‘impure’ is misleading. The adjective ‘functional’ may be more able to capture the essence of the issue. Besides being concerned about the well-being of the less fortunate, a ‘functionally altruistic’ individual would show his concern by personifying it in the form of a personal charitable gift.

CHAPTER 3

'WARM GLOW' THEORETICAL FRAMEWORK

3.1 Setting the Model for Giving

We shall classify society into three groups of people. There are the less fortunate and disadvantaged whose social well-being is somewhat dependent on social welfare – a public good collectively derived from private gifts by certain altruists in society. For the other two groups of people, we shall make reference to the classification that was introduced in the previous chapter – the 'high altruism' and 'low altruism' groups. The former group of individuals are more generous, deriving utility from the act of giving and from their concern for the well-being of the less fortunate. The latter refers the less generous people who hardly contribute private gifts but are concerned about the level of social welfare being provided in society. In such instances, the majority of latter group naturally takes the role of free riders. We shall precisely formalise the above descriptions later in this section.

Now, consider an economy with only one private good that is only consumed by the altruists and one public good that is only consumed by the less fortunate. Assume that the private good can be converted into the public good by a linear technology, which imposes no fee on the altruists. Individuals can allocate their endowed wealth, w_i , between consumption of the private good, c_i , and their gift to the public good, g_i . Assume for now that the public good receives no government support. As such, taking the 'non-satiation' assumption of consumer theory to be in operation, the individual's budget constraint is:

$$(3.1) \quad c_i + g_i = w_i, \quad i = 1, 2$$

The model proceeds with a population of $\sum_{i=1}^3 n_i$, whereby n_1 is the number of high altruism individuals, n_2 is the number of low altruism individuals, and n_3 refers to the number of less fortunate individuals directly benefiting from the public good. For simplicity,

we shall assume that there are constant returns to scale with costs proportional to group size.¹⁴ Hence, the total output of the public good is:

$$(3.2) \quad G = \frac{n_1 g_1 + n_2 g_2}{n_3}$$

Each group is assumed to be large such that the effect of every feasible individual contribution to the public good is negligible.

We shall fashion the heterogeneous functions of the individuals in the two altruist groups after those specified in (2.1) and (2.3). In particular, we shall use quasilinear utility functions for our model:

$$(3.3a) \quad U_1 = c_1 + \mathbf{a}_{12} \ln g_1 + \mathbf{a}_{13} \ln G$$

$$(3.3b) \quad U_2 = c_2 + \mathbf{a}_{23} \ln G$$

While all the individuals derive utility from their personal consumption and from their concern for the level of the public good, the high altruism individual derives additional satisfaction or a ‘warm glow’ from his own personal act of giving, as seen in (3.3a).

Naturally, the variables and parameters in the 2 utility functions above are subject to the non-negativity condition. The price of the private good is set at unity, which is reflected in the absence of \mathbf{a}_{11} and \mathbf{a}_{21} . Although public goods cannot be purchased and sold in the market in the same way as ordinary goods, it is possible to create a ‘pseudo market’ for a public good.¹⁵ In such a market, \mathbf{a}_{12} represents the inputted ‘price’ of private giving. Since the low altruism individuals do not value private giving, their ‘price’ of private giving is zero, which is reflected in the absence of \mathbf{a}_{22} . Similarly, \mathbf{a}_{13} and \mathbf{a}_{23} represent the inputted ‘price’ for the public good. In particular, we set $\mathbf{a}_{13} \geq \mathbf{a}_{23}$ because the high altruism individuals would be expected to derive a higher, if not the same, utility level from the public good than the low altruism individuals.

¹⁴ Holländer (1990, 1158).

¹⁵ Henderson & Quandt (1990, 300).

3.2 Determining the Pareto Optima of Giving

We shall begin by characterising a Pareto efficient allocation first. Such an allocation exists when one consumer is as well-off as possible given the other consumer's utility level. To achieve Pareto optimality, we maximise the utility of the high altruism group assuming that the utility of the low altruism groups is at a predetermined level \bar{U}_2 :

$$(3.4) \quad \max_{c_1, c_2, g_1, g_2, G} U_1 \text{ subject to } U_2(c_2, G) = \bar{U}_2, \quad c_i + g_i = w_i \text{ and } G = \frac{n_1 g_1 + n_2 g_2}{n_3}$$

For clarity of presentation, since we are finding the Pareto optima of 2 groups, and not 2 individuals, there is the need to use the aggregate functions when we form our Lagrangean function:

$$(3.5) \quad L = n_1(c_1 + \mathbf{a}_{12} \ln g_1 + \mathbf{a}_{13} \ln G) + I_1 n_2(c_2 + \mathbf{a}_{23} \ln G - \bar{U}_2) \\ + I_2[n_1(w_1 - c_1 - g_1) + n_2(w_2 - c_2 - g_2)] + I_3\left(\frac{n_1 g_1 + n_2 g_2}{n_3} - G\right)$$

Differentiating with respect to c_1 , c_2 , g_1 , g_2 and G , we obtain the first order conditions:

$$(3.6a) \quad \frac{\partial L}{\partial c_1} = n_1 - I_2 n_1 = 0 \quad \Rightarrow I_2 = 1$$

$$(3.6b) \quad \frac{\partial L}{\partial c_2} = I_1 n_2 - I_2 n_2 = 0 \quad \Rightarrow I_2 = I_1 = 1$$

$$(3.6c) \quad \frac{\partial L}{\partial g_1} = n_1 \frac{\mathbf{a}_{12}}{g_1} - I_2 n_1 + I_3 \frac{n_1}{n_3} = 0 \quad \Rightarrow \frac{\mathbf{a}_{12}}{g_1} - 1 - \frac{I_3}{n_3} = 0$$

$$(3.6d) \quad \frac{\partial L}{\partial g_2} = -I_2 n_2 + I_3 \frac{n_2}{n_3} = 0 \quad \Rightarrow I_3 = n_3$$

$$(3.6e) \quad \frac{\partial L}{\partial G} = n_1 \frac{\mathbf{a}_{13}}{G} + I_1 n_2 \frac{\mathbf{a}_{23}}{G} - I_3 = 0 \quad \Rightarrow G = \frac{n_1 \mathbf{a}_{13} + n_2 \mathbf{a}_{23}}{n_3}$$

From simultaneously solving the first order conditions, we observe that:

$$(3.7) \quad G = \frac{n_1 g_1 + n_2 g_2}{n_3} = \frac{n_1 \mathbf{a}_{13} + n_2 \mathbf{a}_{23}}{n_3}$$

Based on the above equation, we may obtain multiple Pareto efficient allocations. To our benefit, Henderson & Quandt (1990, 300-302) show that, in a Lindahl equilibrium, there is *one* possible Pareto efficient allocation, based on each individual maximising his utility subject to his budget constraint and the inputted ‘prices’ of the act of giving and the public good. This particular set of Pareto optima is:

$$(3.8) \quad g_{s,1}^* = \mathbf{a}_{13}, \quad g_{s,2}^* = \mathbf{a}_{23}$$

3.3 Determining the Private Optima of Giving

Let us now focus on obtaining the private optimal level of giving by the individuals in the 2 groups. In particular, we only need to maximise the utility derived from personal consumption and giving. The utility derived from the public good is excluded, as the individual’s contribution to the public good is negligible in the large population. Let us first maximise the utility for a high altruism individual subject to his budget constraint:

$$(3.9) \quad \begin{aligned} & \max_{g_1} U_1 \text{ subject to } c_1 + g_1 = w_1 \text{ and } c_1, g_1 \geq 0 \\ & = \max_{g_1} [(w_1 - g_1) + \mathbf{a}_{12} \ln g_1 + \mathbf{a}_{13} \ln G] \end{aligned}$$

Differentiating with respect to g_1 , we obtain the first order condition:

$$(3.10) \quad \frac{\partial U_1}{\partial g_1} = -1 + \frac{\mathbf{a}_{12}}{g_1^*} = 0$$

Therefore, the private optimal level of giving for the high altruism individual is:

$$(3.11a) \quad g_{p,1}^* = \mathbf{a}_{12}$$

Since the low altruism individual does not even derive utility from personal giving, we can clearly determine the private optimal level of giving for him subject to the non-negativity condition:

$$(3.11b) \quad g_{p,2}^* = 0$$

Therefore, the high altruism individuals will be the only people supplying the public good, while the low altruism individuals will be the free riders, resulting in Pareto sub-optimality.

Using the private optima determined in (3.4), we shall now determine the utility level of a high altruism individual and a low altruism individual:

$$\begin{aligned}
 (3.12a) \quad U_{p,1} &= c_1 + \mathbf{a}_{12} \ln g_1 + \mathbf{a}_{13} \ln G \\
 &= (w_1 - g_1) + \mathbf{a}_{12} \ln g_1 + \mathbf{a}_{13} \ln \frac{n_1 g_1 + n_2 g_2}{n_3} \\
 &= w_1 + \mathbf{a}_{12} (\ln \mathbf{a}_{12} - 1) + \mathbf{a}_{13} \ln \frac{n_1}{n_3} \mathbf{a}_{12}
 \end{aligned}$$

$$\begin{aligned}
 (3.12b) \quad U_{p,2} &= c_2 + \mathbf{a}_{23} \ln G \\
 &= (w_2 - g_2) + \mathbf{a}_{23} \ln \frac{n_1 g_1 + n_2 g_2}{n_3} \\
 &= w_2 + \mathbf{a}_{23} \ln \frac{n_1}{n_3} \mathbf{a}_{12}
 \end{aligned}$$

Comparing the utility levels of the individuals in both groups, it is ambiguous as to which individual has a higher utility level.

3.4 Impact of Compulsory Transfer via Taxation

The Pareto sub-optimality of voluntary provision provides justification for redistribution through a system of transfers funded by taxation (Hochman & Rodgers, 1969). As utility interdependence generates positive externalities which cannot be fully internalised by voluntary activity (due to free riding), compulsory redistribution through government policy may be Pareto-improving. We shall now analyse the effect of compulsory transfer on the level of private giving in society.

If the government knew the preferences of every individual, it could simply set two different tax rates to target the two groups of individuals, so as to effectively achieve the Pareto optima of giving in the Lindahl equilibrium. However, let us assume that the government does not know the exact preference of each individual in society. As such, given the constraint of incomplete information while attempting to improve the private level of giving, the government sets the tax rate at the minimum of the 2 Pareto optimal values

derived in (3.8). Therefore, the tax rate is set at \mathbf{a}_{23} , which is the low altruism individual's 'price' of the public good in the Lindahl equilibrium.

It is the total supply of the public good, and not its source of finance, which enters both individuals' utility functions. Forced contributions through taxation may be usually considered as a perfect substitute for voluntary gifts. When a lump-sum tax is introduced, the individual may restore his original proportion of consumption via a compensating reduction in the value of his gift. Hence, we shall assume that the individual can derive the same level of utility from either paying his lump-sum tax or giving a voluntary contribution of the same amount as the tax. The amount of public good produced shall now be expressed as:

$$(3.13) \quad G = \frac{n_1(g_1 + \mathbf{a}_{23}) + n_2(g_2 + \mathbf{a}_{23})}{n_3}$$

With the implementation of the lump-sum tax, the utility functions of the 2 groups are now:

$$(3.14a) \quad U_1^t = c_1 + \mathbf{a}_{12} \ln(g_1 + \mathbf{a}_{23}) + \mathbf{a}_{13} \ln G$$

$$(3.14b) \quad U_2^t = c_2 + \mathbf{a}_{23} \ln G$$

To determine the private optimal level of giving by the 2 groups, we need to maximise only the utility derived from personal consumption and giving. The utility derived from the public good is excluded (like in the previous case without tax), as the individual's contribution to the public good is negligible in the large population. Let us first maximise the utility for a high altruism individual subject to his budget constraint:

$$(3.15) \quad \max_{g_1} U_1^t \text{ subject to } c_1 + (g_1 + \mathbf{a}_{23}) = w_1 \text{ and } c_1, g_1 \geq 0$$

We shall solve the problem using the Kuhn-Tucker conditions¹⁶. We start by setting up the Lagrangean function:

¹⁶ According to Lambert (1985), for the problem $\max_{x_i, i=1, \dots, n} f(x)$ such that $x_k \geq 0$ for certain

$k \in \{1, 2, \dots, n\}$ and $g_j(x) \leq b_j$ (additional constraints $j = 1, 2, \dots, m$), the Lagrangean is $L = f(x) - \mathbf{I}[g(x) - b]$. A vector x and a multiplier \mathbf{I} satisfy the Kuhn-Tucker conditions for the above problem if :

(i) $\frac{\partial L}{\partial x_i} = 0, i \neq k \in \{1, 2, \dots, n\}$;

$$(3.16) \quad L = c_1 + \mathbf{a}_{12} \ln(g_1 + \mathbf{a}_{23}) + \mathbf{a}_{13} \ln G + \mathbf{I}(w_1 - c_1 - g_1 - \mathbf{a}_{23})$$

We now maximise the Lagrangean function with respect to the variables c_1 and g_1 , and minimise it with respect to the variable \mathbf{I} , subject to the constraints $c_1, g_1, \mathbf{I} \geq 0$. This yields the Kuhn-Tucker conditions:

$$(3.17a) \quad \frac{\partial L}{\partial c_1} = 1 - \mathbf{I}^* \leq 0, \quad c_1^* \geq 0, \quad c_1^*(1 - \mathbf{I}^*) = 0$$

$$(3.17b) \quad \frac{\partial L}{\partial g_1} = \frac{\mathbf{a}_{12}}{g_1^* + \mathbf{a}_{23}} - \mathbf{I}^* \leq 0, \quad g_1^* \geq 0, \quad g_1^* \left(\frac{\mathbf{a}_{12}}{g_1^* + \mathbf{a}_{23}} - \mathbf{I}^* \right) = 0$$

$$(3.17c) \quad \frac{\partial L}{\partial \mathbf{I}} = w_1 - c_1^* - g_1^* - \mathbf{a}_{23} \geq 0, \quad \mathbf{I}^* \geq 0, \quad \mathbf{I}^*(w_1 - c_1^* - g_1^* - \mathbf{a}_{23}) = 0$$

The assumption of ‘non-satiation’ definitely holds at equilibrium, hence the budget constraint is definitely binding. As there is constant marginal utility from private consumption, we shall assume, for simplicity, that \mathbf{a}_{12} is not so large to the extent that $c_1^* = 0$. Then, from (3.17a), we see that, if $c_1^* > 0$, we must also have $\mathbf{I}^* = 1$. Then (3.17b) gives the private optimal level of giving for the high altruism individual:

$$(3.18a) \quad g_{p,1}^* = \begin{cases} \mathbf{a}_{12} - \mathbf{a}_{23} & \text{if } \mathbf{a}_{12} \geq \mathbf{a}_{23} \\ 0 & \text{if } \mathbf{a}_{12} < \mathbf{a}_{23} \end{cases}$$

Similar to the original model, the low altruism individual does not even derive utility from personal giving in this adapted model. As such, we can clearly determine the private optimal level of giving for this individual:

$$(3.18b) \quad g_{p,2}^* = 0$$

Even though the free-riding low altruism individuals are now contributing to the public good by paying taxes, their act of giving is still not explicitly reflected in their utility

$$(ii) \quad x_k \geq 0, \quad \frac{\partial L}{\partial x_k} \leq 0 \quad \text{and} \quad x_k \left(\frac{\partial L}{\partial x_k} \right) = 0 \quad \text{for all } k; \quad \text{and}$$

$$(iii) \quad \mathbf{I}_j \geq 0, \quad \frac{\partial L}{\partial \mathbf{I}_j} \geq 0 \quad \text{and} \quad \mathbf{I}_j \left(\frac{\partial L}{\partial \mathbf{I}_j} \right) = 0, \quad j = 1, 2, \dots, m.$$

function. As such, moralists may not regard the act of compulsory transfer via taxation as ‘pure’ giving by the free riders, because the individual’s generosity is initiated by government action and not self-initiated.

For the purpose of comparison with the earlier model without taxation, we shall now determine the utility level of a high altruism individual and a low altruism individual:

$$\begin{aligned}
 (3.19a) \quad U_{p,1}^t &= c_1 + \mathbf{a}_{12} \ln(g_1 + \mathbf{a}_{23}) + \mathbf{a}_{13} \ln G \\
 &= (w_1 - g_1 - \mathbf{a}_{23}) + \mathbf{a}_{12} \ln(g_1 + \mathbf{a}_{23}) + \mathbf{a}_{13} \ln \frac{n_1(g_1 + \mathbf{a}_{23}) + n_2(g_2 + \mathbf{a}_{23})}{n_3} \\
 &= \begin{cases} w_1 + \mathbf{a}_{12}(\ln \mathbf{a}_{12} - 1) + \mathbf{a}_{13} \ln \frac{n_1 \mathbf{a}_{12} + n_2 \mathbf{a}_{23}}{n_3} & \text{if } \mathbf{a}_{12} \geq \mathbf{a}_{23} \\ w_1 + \mathbf{a}_{12} \ln \mathbf{a}_{23} + \mathbf{a}_{13} \ln \frac{n_1 + n_2}{n_3} \mathbf{a}_{23} - \mathbf{a}_{23} & \text{if } \mathbf{a}_{12} < \mathbf{a}_{23} \end{cases}
 \end{aligned}$$

$$\begin{aligned}
 (3.19b) \quad U_{p,2}^t &= c_2 + \mathbf{a}_{23} \ln G \\
 &= (w_2 - g_2 - \mathbf{a}_{23}) + \mathbf{a}_{23} \ln \frac{n_1(g_1 + \mathbf{a}_{23}) + n_2(g_2 + \mathbf{a}_{23})}{n_3} \\
 &= \begin{cases} w_2 + \mathbf{a}_{23} \left(\ln \frac{n_1 \mathbf{a}_{12} + n_2 \mathbf{a}_{23}}{n_3} - 1 \right) & \text{if } \mathbf{a}_{12} \geq \mathbf{a}_{23} \\ w_2 + \mathbf{a}_{23} \left(\ln \frac{n_1 + n_2}{n_3} \mathbf{a}_{23} - 1 \right) & \text{if } \mathbf{a}_{12} < \mathbf{a}_{23} \end{cases}
 \end{aligned}$$

Referring to (3.12), let us check for the change in the utility level of an individual in each group. Firstly, we shall consider the case when $\mathbf{a}_{12} \geq \mathbf{a}_{23}$:

$$\begin{aligned}
 (3.20a) \quad \Delta U_{p,1}^t &= U_{p,1}^t - U_{p,1} \\
 &= \left[w_1 + \mathbf{a}_{12}(\ln \mathbf{a}_{12} - 1) + \mathbf{a}_{13} \ln \frac{n_1 \mathbf{a}_{12} + n_2 \mathbf{a}_{23}}{n_3} \right] \\
 &\quad - \left[w_1 + \mathbf{a}_{12}(\ln \mathbf{a}_{12} - 1) + \mathbf{a}_{13} \ln \frac{n_1}{n_3} \mathbf{a}_{12} \right] \\
 &= \mathbf{a}_{13} \ln \left(1 + \frac{n_2 \mathbf{a}_{23}}{n_1 \mathbf{a}_{12}} \right)
 \end{aligned}$$

$$\begin{aligned}
(3.20b) \quad \Delta U_{p,2}^t &= U_{p,2}^t - U_{p,2} \\
&= \left[w_2 + \mathbf{a}_{23} \left(\ln \frac{n_1 \mathbf{a}_{12} + n_2 \mathbf{a}_{23}}{n_3} - 1 \right) \right] - \left(w_2 + \mathbf{a}_{23} \ln \frac{n_1}{n_3} \mathbf{a}_{12} \right) \\
&= \mathbf{a}_{23} \left[\ln \left(1 + \frac{n_2 \mathbf{a}_{23}}{n_1 \mathbf{a}_{12}} \right) - 1 \right]
\end{aligned}$$

Now, we shall consider the other case when $\mathbf{a}_{12} < \mathbf{a}_{23}$:

$$\begin{aligned}
(3.21a) \quad \Delta U_{p,1}^t &= U_{p,1}^t - U_{p,1} \\
&= \left[w_1 + \mathbf{a}_{12} \ln \mathbf{a}_{23} + \mathbf{a}_{13} \ln \frac{n_1 + n_2}{n_3} \mathbf{a}_{23} - \mathbf{a}_{23} \right] \\
&\quad - \left[w_1 + \mathbf{a}_{12} (\ln \mathbf{a}_{12} - 1) + \mathbf{a}_{13} \ln \frac{n_1}{n_3} \mathbf{a}_{12} \right] \\
&= \mathbf{a}_{12} \left(1 + \ln \frac{\mathbf{a}_{23}}{\mathbf{a}_{12}} \right) + \mathbf{a}_{13} \ln \left(1 + \frac{n_2}{n_1} \right) \frac{\mathbf{a}_{23}}{\mathbf{a}_{12}} - \mathbf{a}_{23}
\end{aligned}$$

$$\begin{aligned}
(3.21b) \quad \Delta U_{p,2}^t &= U_{p,2}^t - U_{p,2} \\
&= \left[w_2 + \mathbf{a}_{23} \left(\ln \frac{n_1 + n_2}{n_3} \mathbf{a}_{23} - 1 \right) \right] - \left(w_2 + \mathbf{a}_{23} \ln \frac{n_1}{n_3} \mathbf{a}_{12} \right) \\
&= \mathbf{a}_{23} \left[\ln \left(1 + \frac{n_2}{n_1} \right) \frac{\mathbf{a}_{23}}{\mathbf{a}_{12}} - 1 \right]
\end{aligned}$$

In summary:

$$(3.22a) \quad \Delta U_{p,1}^t = \begin{cases} \mathbf{a}_{13} \ln \left(1 + \frac{n_2 \mathbf{a}_{23}}{n_1 \mathbf{a}_{12}} \right) & \text{if } \mathbf{a}_{12} \geq \mathbf{a}_{23} \\ \mathbf{a}_{12} \left(1 + \ln \frac{\mathbf{a}_{23}}{\mathbf{a}_{12}} \right) + \mathbf{a}_{13} \ln \left(1 + \frac{n_2}{n_1} \right) \frac{\mathbf{a}_{23}}{\mathbf{a}_{12}} - \mathbf{a}_{23} & \text{if } \mathbf{a}_{12} < \mathbf{a}_{23} \end{cases}$$

$$(3.22b) \quad \Delta U_{p,2}^t = \begin{cases} \mathbf{a}_{23} \left[\ln \left(1 + \frac{n_2 \mathbf{a}_{23}}{n_1 \mathbf{a}_{12}} \right) - 1 \right] & \text{if } \mathbf{a}_{12} \geq \mathbf{a}_{23} \\ \mathbf{a}_{23} \left[\ln \left(1 + \frac{n_2}{n_1} \right) \frac{\mathbf{a}_{23}}{\mathbf{a}_{12}} - 1 \right] & \text{if } \mathbf{a}_{12} < \mathbf{a}_{23} \end{cases}$$

When $\boxed{\mathbf{a}_{12} \geq \mathbf{a}_{23}}$, we clearly observe that $\Delta U_{p,1}^t > 0$. The tax policy has made the high altruism individual better off (in terms of utility), as there is now a greater amount of the public good being produced. However, for the low altruism individual, $\Delta U_{p,2}^t \geq 0$ if $\frac{n_2}{n_1} \geq (e-1) \frac{\mathbf{a}_{12}}{\mathbf{a}_{23}}$, and $\Delta U_{p,2}^t < 0$ if $\frac{n_2}{n_1} < (e-1) \frac{\mathbf{a}_{12}}{\mathbf{a}_{23}}$, where $e \approx 2.718$. The ratio of the individuals in the 2 groups is thus important in determining whether the low altruism individuals are better off with the implementation of the tax policy.

There are 2 possible ways in which the tax policy may make the low altruism individual better off (in terms of utility). One way is for the number of low altruism individuals to be sufficiently large in relation to the other group, while the other way is for the low altruists to increase the ‘price’ at which they value the public good.

When $\boxed{\mathbf{a}_{12} < \mathbf{a}_{23}}$, the effect of the tax policy on the high altruism individual is ambiguous. If the collective positive strength of $\mathbf{a}_{12} \left(1 + \ln \frac{\mathbf{a}_{23}}{\mathbf{a}_{12}}\right)$ and $\mathbf{a}_{13} \ln \left(1 + \frac{n_2}{n_1}\right) \mathbf{a}_{12}$ overcomes the negative pull of \mathbf{a}_{23} , then $\Delta U_{p,1}^t \geq 0$. Conversely, $\Delta U_{p,1}^t < 0$ if $-\mathbf{a}_{23}$ overcomes these 2 positive terms. Intuitively, to raise his own well-being despite paying the tax, the responsibility is on the high altruism individual to value his own private giving and the public good at a ‘price’ higher than that which the low altruism individual values the public good.

For the low altruism individual, $\Delta U_{p,2}^t \geq 0$ if $\frac{n_2}{n_1} \geq e \frac{\mathbf{a}_{12}}{\mathbf{a}_{23}} - 1$, and $\Delta U_{p,2}^t < 0$ if

$$\frac{n_2}{n_1} < e \frac{\mathbf{a}_{12}}{\mathbf{a}_{23}} - 1, \text{ where } e \approx 2.718. \text{ Reference must again be made to the ratio of the}$$

individuals in the 2 groups, as well as the value that the individuals place on their giving and the public good. There are 2 possible ways in which the tax policy may make the low altruism individual better off (in terms of utility). One way is for the number of low altruism

individuals to be sufficiently large in relation to the other group, while the other way is for the low altruism individuals to increase the 'price' at which they value the public good.

Therefore, given the 'correct' proportions of high and low altruism individuals, and the 'correct' relative 'prices' of giving and of the public good, it is possible that all individuals can be made better off (in terms of utility) with the implementation of a tax policy to enforce compulsory transfer. One interesting implication which we can draw in our analysis here is that a constrained policy of compulsory transfer via taxation may have Pareto improving effects.

CHAPTER 4

'GROUP KANTIANISM' THEORETICAL FRAMEWORK

4.1 Setting the Model for Giving

Kantian altruism or Kantianism in short, was introduced by Collard (1978). The notion is based on one of the moral laws of moralist Immanuel Kant, which postulates that an individual feels obliged to contribute the amount which corresponds to the amount which he believes everybody should, ideally, contribute. When deciding whether or not to free ride, an altruist considers the effect of his own contribution towards the public good. On the other hand, the Kantian will ask what will happen if others were to behave in the manner he intended to.¹⁷

“There is, therefore, only one categorical imperative, and it is this: Act only on that maxim through which you can at the same time will that it should become a universal law.”
[Kant, as quoted in Copleston (1985, 324)]

The motivation of Kantianism leads us to feel that society may be Pareto-improving if everybody felt morally obliged to contribute a uniform amount to the public good. As our objective is to analyse the effect of heterogeneous tastes in charitable giving, it is necessary that we depart from Collard's framework of Kantianism. In our framework, we assume that each individual acts as a Kantian *within his own group*. This chapter will present our second model, which shall feature 2 groups of Kantians. We shall analyse the effect of heterogeneous preference on giving by these 'group Kantians'.

In this 'group Kantianism' model, the individual is concerned about maximising his utility derived from only personal consumption and the public good. The utility derived from the personal giving is not included, because the 'group Kantian' values his private giving on the amount which he believes the others in his group should (and would) give. As such, the utility functions of the individuals in the 2 groups are:

¹⁷ Collard (1978, 15).

$$(4.1a) \quad U_1^k = c_1 + \mathbf{a}_{13} \ln G$$

$$(4.1b) \quad U_2^k = c_2 + \mathbf{a}_{23} \ln G$$

Naturally, the variables and parameters in the 2 utility functions above are subject to the non-negativity condition. In particular, we set $\mathbf{a}_{13} > \mathbf{a}_{23}$. The strict inequality exists to allow us to reflect the different preferences of the 2 groups. The high altruism ‘group Kantians’ value the public good more than the low altruism ‘group Kantians’, and thus would be expected to derive a higher level of utility from the public good.

At this juncture, we should make a clear distinction for G in both frameworks. Although the ‘warm glow’ altruist is concerned about the total level of public good available, he believes in the significant role that his own gift plays in producing the public good. For clarity of presentation, we may re-express G in the ‘warm glow’ framework as:

$$(4.2) \quad G = \frac{\hat{g}_i + (n_i - 1)g_i + n_{-i}g_{-i}}{n_3}$$

where \hat{g}_i refers to a particular individual’s private gift, g_i refers to giving by the others in his group, and g_{-i} refers to giving by the individuals in the other group. As such, for simplicity, we used the function of G as in (3.2). On the other hand, the ‘group Kantian’ believes that all individuals in his group should give a uniform amount of g_i , and thus feels obliged to give g_i as well. Hence, it is acceptable to use the same expression of G , as in (3.2), for the ‘group Kantianism’ framework.

4.2 Determining the Pareto Optima of Giving

Given the almost similar nature of the utility functions (4.1) with those in (3.3) from the ‘warm glow’ framework, we may use the same method to determine the Pareto efficient allocation. A distinct difference between the 2 cases lies in the absence of private giving in the utility function of the high altruism ‘group Kantian’. At closer inspection, we realise that the private giving function only plays a role in the differentiation of the Lagrangean function

with respect to g_1 , as in (3.6c), but does not affect the overall solution to the utility-maximising problem. Therefore, as in the ‘warm glow’ framework, there is *one* possible Pareto efficient allocation in a Lindahl equilibrium. This particular set of Pareto optima is:

$$(4.3) \quad g_{s,1}^* = \mathbf{a}_{13}, \quad g_{s,2}^* = \mathbf{a}_{23}$$

4.3 Determining the Private Optima of Giving

Let us maximise utility for a high altruism ‘group Kantian’ subject to his budget constraint:

$$(4.4) \quad \begin{aligned} & \max_{g_1} U_1^k(c_1, g_1) \text{ subject to } c_1 + g_1 = w_1 \text{ and } c_1, g_1 \geq 0 \\ & = \max_{g_1} \left[(w_1 - g_1) + \mathbf{a}_{13} \ln \frac{n_1 g_1 + n_2 g_2}{n_3} \right] \end{aligned}$$

Differentiating with respect to g_1 , we obtain the first order condition:

$$(4.5) \quad \frac{\partial U_1}{\partial g_1} = -1 + \frac{\mathbf{a}_{13} n_1}{n_1 g_1 + n_2 g_2} = 0$$

Rearranging the terms, we derive the reaction function for the high altruism ‘group Kantian’:

$$(4.6) \quad RF_1: \quad g_1^* = \mathbf{a}_{13} - \frac{n_2}{n_1} g_2$$

Let us similarly maximise utility for the low altruism ‘group Kantian’ subject to his budget constraint:

$$(4.7) \quad \begin{aligned} & \max_{g_2} U_2^k(c_2, g_2) \text{ subject to } c_2 + g_2 = w_2 \text{ and } c_2, g_2 \geq 0 \\ & = \max_{g_2} \left[(w_2 - g_2) + \mathbf{a}_{23} \ln \frac{n_1 g_1 + n_2 g_2}{n_3} \right] \end{aligned}$$

Differentiating with respect to g_2 , we obtain the first order condition:

$$(4.8) \quad \frac{\partial U_2}{\partial g_2} = -1 + \frac{\mathbf{a}_{23} n_2}{n_1 g_1 + n_2 g_2} = 0$$

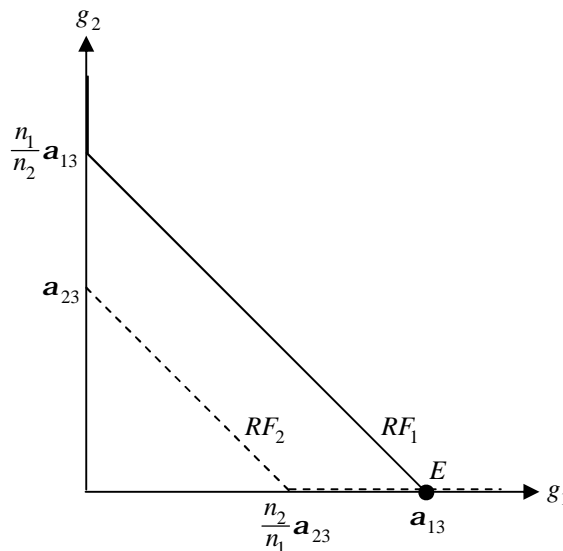
The reaction function for the high altruism ‘group Kantian’ is:

$$(4.9) \quad RF_2 : g_2^* = a_{23} - \frac{n_1}{n_2} g_1$$

Illustrating the 2 reaction functions together, we are able to determine the private optima of the ‘group Kantians’:

Figure 4.1

DETERMINING THE PRIVATE OPTIMA OF GIVING FOR ‘GROUP KANTIANS’



Referring to the intersection of the 2 reaction functions at E in Figure 4.1, the private optimal levels of giving for the ‘group Kantians’ are:

$$(4.10) \quad g_{p,1}^{k,*} = a_{13}, g_{p,2}^{k,*} = 0$$

These results are significant because it shows that the high altruism individual would be able to achieve his Pareto optimal level of giving if he subscribed to the notion of ‘group Kantianism’. Despite being ‘group Kantians’, the low altruism individuals still act as free riders and fail to contribute anything to the public good.

At this juncture, it may be observed that this allocation of private optima is not unique. Other allocations of private optima exist depending on the ratio of n_1 to n_2 . If n_2 is sufficiently larger than n_1 , it is possible to achieve a range of other allocations. In the extreme case, it may be even possible to achieve the other ‘corner solution’, where the high altruism ‘group Kantian’ becomes the free rider and the low altruism ‘group Kantian’ is

achieving his Pareto optimal level of giving. Given the possibility of the existence of almost infinite private optima, we shall limit our study to the case illustrated by Figure 4.1, with the assumption that $\frac{n_1}{n_2} \mathbf{a}_{13} > \mathbf{a}_{23}$.

Using the private optima determined in (4.10), we shall now determine the utility level of a high altruism individual and a low altruism individual:

$$\begin{aligned}
 (4.11a) \quad U_{p,1}^k &= c_1 + \mathbf{a}_{13} \ln G \\
 &= (w_1 - g_1) + \mathbf{a}_{13} \ln \frac{n_1 g_1 + n_2 g_2}{n_3} \\
 &= w_1 + \mathbf{a}_{13} \left(\ln \frac{n_1}{n_3} \mathbf{a}_{13} - 1 \right)
 \end{aligned}$$

$$\begin{aligned}
 (4.11b) \quad U_{p,2}^k &= c_2 + \mathbf{a}_{23} \ln G \\
 &= (w_2 - g_2) + \mathbf{a}_{23} \ln \frac{n_1 g_1 + n_2 g_2}{n_3} \\
 &= w_2 + \mathbf{a}_{23} \ln \frac{n_1}{n_3} \mathbf{a}_{13}
 \end{aligned}$$

Comparing the utility levels of the individuals in both groups, it is ambiguous as to which individual has a higher utility level.

4.4 Impact of Compulsory Transfer via Taxation

Let us subject our ‘group Kantianism’ model to taxation, so as to allow the government to generate revenue to fund the production of the public good. We assume that the government does not know the exact preference of each individual in society, and sets the tax rate at the minimum of the 2 Pareto optima. The tax rate is set at \mathbf{a}_{23} , which is the low altruism individual’s ‘price’ of the public good in the Lindahl equilibrium. We shall also assume that the individual can derive the same level of utility from either paying his lump-

sum tax or giving a voluntary contribution of the same amount as the tax. With the implementation of a lump-sum tax, the utility functions of the 2 groups are now:

$$(4.12a) \quad U_1^{k,t} = c_1 + \mathbf{a}_{13} \ln \frac{n_1(g_1 + \mathbf{a}_{23}) + n_2(g_2 + \mathbf{a}_{23})}{n_3}$$

$$(4.12b) \quad U_2^{k,t} = c_2 + \mathbf{a}_{23} \ln \frac{n_1(g_1 + \mathbf{a}_{23}) + n_2(g_2 + \mathbf{a}_{23})}{n_3}$$

Let us maximise utility for a high altruism ‘group Kantian’ subject to his budget constraint:

$$(4.13) \quad \max_{g_1} U_1^{k,t} \text{ subject to } c_1 + (g_1 + \mathbf{a}_{23}) = w_1 \text{ and } c_1, g_1 \geq 0$$

We shall solve the problem using the Kuhn-Tucker conditions. We start by setting up the Lagrangean function:

$$(4.14) \quad L = c_1 + \mathbf{a}_{13} \ln \frac{n_1(g_1 + \mathbf{a}_{23}) + n_2(g_2 + \mathbf{a}_{23})}{n_3} + \mathbf{I}(w_1 - c_1 - g_1 - \mathbf{a}_{23})$$

We now maximise the Lagrangean function with respect to the variables c_1 and g_1 , and minimise it with respect to the variable \mathbf{I} , subject to the constraints $c_1, g_1, \mathbf{I} \geq 0$. This yields the Kuhn-Tucker conditions:

$$(4.15a) \quad \frac{\partial L}{\partial c_1} = 1 - \mathbf{I}^* \leq 0, \quad c_1^* \geq 0, \quad c_1^*(1 - \mathbf{I}^*) = 0$$

$$(4.15b) \quad \frac{\partial L}{\partial g_1} = \frac{n_1 \mathbf{a}_{13}}{n_1(g_1^* + \mathbf{a}_{23}) + n_2(g_2 + \mathbf{a}_{23})} - \mathbf{I}^* \leq 0, \quad g_1^* \geq 0,$$

$$g_1^* \left(\frac{n_1 \mathbf{a}_{13}}{n_1(g_1^* + \mathbf{a}_{23}) + n_2(g_2 + \mathbf{a}_{23})} - \mathbf{I}^* \right) = 0$$

$$(4.15c) \quad \frac{\partial L}{\partial \mathbf{I}} = w_1 - c_1^* - g_1^* - \mathbf{a}_{23} \geq 0, \quad \mathbf{I}^* \geq 0, \quad \mathbf{I}^*(w_1 - c_1^* - g_1^* - \mathbf{a}_{23}) = 0$$

The assumption of ‘non-satiation’ definitely holds at equilibrium, hence the budget constraint is definitely binding. As there is constant marginal utility from private consumption, we shall assume, for simplicity, that \mathbf{a}_{13} is not so large to the extent that $c_1^* = 0$. Then, from (4.15a), we see that, if $c_1^* > 0$, we must also have $\mathbf{I}^* = 1$. Then (4.15b) gives the private optimal level of giving for the high altruism individual:

$$(4.16) \quad RF_1: \quad g_1^* = \left[\mathbf{a}_{13} - \left(1 + \frac{n_2}{n_1} \right) \mathbf{a}_{23} \right] - \frac{n_2}{n_1} \overline{g_2}$$

Now, let us similarly maximise utility for the low altruism ‘group Kantian’ subject to his budget constraint:

$$(4.17) \quad \max_{g_2} U_{k,2}^t \text{ such that } c_2 + (g_2 + \mathbf{a}_{23}) = w_2 \text{ and } c_2, g_2 \geq 0$$

To solve the problem using the Kuhn-Tucker conditions, we shall set up the Lagrangean function:

$$(4.18) \quad L = c_2 + \mathbf{a}_{23} \ln \frac{n_1(g_1 + \mathbf{a}_{23}) + n_2(g_2 + \mathbf{a}_{23})}{n_3} + \mathbf{I}(w_2 - c_2 - g_2 - \mathbf{a}_{23})$$

We now maximise the Lagrangean function with respect to the variables c_1 and g_1 , and minimise it with respect to the variable \mathbf{I} , subject to the constraints $c_1, g_1, \mathbf{I} \geq 0$. This yields the Kuhn-Tucker conditions:

$$(4.19a) \quad \frac{\partial L}{\partial c_2} = 1 - \mathbf{I}^* \leq 0, \quad c_1^* \geq 0, \quad c_1^*(1 - \mathbf{I}^*) = 0$$

$$(4.19b) \quad \frac{\partial L}{\partial g_2} = \frac{n_2 \mathbf{a}_{23}}{n_1(g_1 + \mathbf{a}_{23}) + n_2(g_2^* + \mathbf{a}_{23})} - \mathbf{I}^* \leq 0, \quad g_2^* \geq 0,$$

$$g_2^* \left(\frac{n_2 \mathbf{a}_{23}}{n_1(g_1 + \mathbf{a}_{23}) + n_2(g_2^* + \mathbf{a}_{23})} - \mathbf{I}^* \right) = 0$$

$$(4.19c) \quad \frac{\partial L}{\partial \mathbf{I}} = w_2 - c_2^* - g_2^* - \mathbf{a}_{23} \geq 0, \quad \mathbf{I}^* \geq 0, \quad \mathbf{I}^*(w_2 - c_2^* - g_2^* - \mathbf{a}_{23}) = 0$$

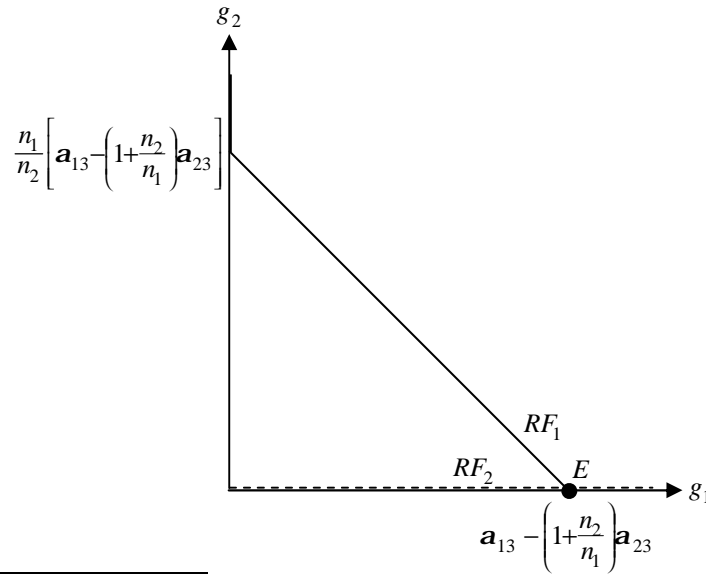
The assumption of ‘non-satiation’ definitely holds at equilibrium, hence the budget constraint is definitely binding. As there is constant marginal utility from private consumption, we shall assume, for simplicity, that \mathbf{a}_{23} is not so large to the extent that $c_1^* = 0$. Then, from (4.19a), we see that, if $c_1^* > 0$, we must also have $\mathbf{I}^* = 1$. Then (4.19b) gives the private optimal level of giving for the high altruism individual:

$$(4.20) \quad RF_2: \quad g_2^* = -\frac{n_1}{n_2} \mathbf{a}_{23} - \frac{n_1}{n_2} \overline{g_1}$$

Illustrating the 2 reaction functions together, we are able to determine the private optima of the ‘group Kantians’. Figures 5.1 and 5.2 illustrate the 2 possible cases.

Figure 5.1

DETERMINING THE PRIVATE OPTIMA OF GIVING: $a_{13} > \left(1 + \frac{n_2}{n_1}\right) a_{23}$

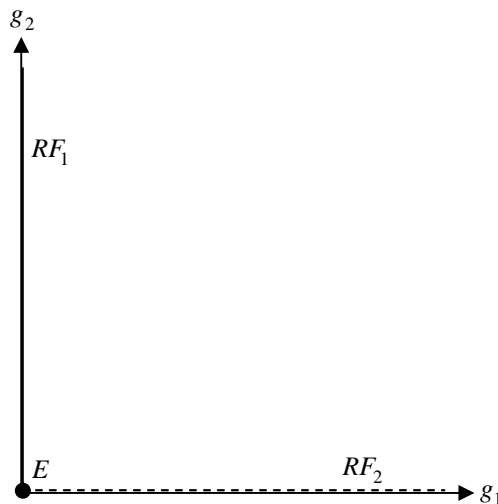


When $a_{13} > \left(1 + \frac{n_2}{n_1}\right) a_{23}$, the private optimal levels of giving for the ‘group Kantians’ are:

$$(4.21) \quad g_{p,1}^{k,t,*} = a_{13} - \left(1 + \frac{n_2}{n_1}\right) a_{23}, \quad g_{p,2}^{k,t,*} = 0$$

Figure 5.2

DETERMINING THE PRIVATE OPTIMA OF GIVING: $a_{13} \leq \left(1 + \frac{n_2}{n_1}\right) a_{23}$



When $\mathbf{a}_{13} \leq \left(1 + \frac{n_2}{n_1}\right) \mathbf{a}_{23}$, the private optimal levels of giving for the ‘group Kantians’ are:

$$(4.22) \quad g_{p,1}^{k,t,*} = 0, \quad g_{p,2}^{k,t,*} = 0$$

Combining (4.21) and (4.22) together:

$$(4.23a) \quad g_{p,1}^{k,t,*} = \begin{cases} \mathbf{a}_{13} - \left(1 + \frac{n_2}{n_1}\right) \mathbf{a}_{23} & \text{if } \mathbf{a}_{13} > \left(1 + \frac{n_2}{n_1}\right) \mathbf{a}_{23} \\ 0 & \text{if } \mathbf{a}_{13} \leq \left(1 + \frac{n_2}{n_1}\right) \mathbf{a}_{23} \end{cases}$$

$$(4.23b) \quad g_{p,2}^{k,t,*} = 0$$

For the purpose of comparison with the earlier model without taxation, we shall now determine the utility level of a high altruism individual and a low altruism individual:

$$(4.24a) \quad U_{p,1}^{k,t} = c_1 + \mathbf{a}_{13} \ln G$$

$$= (w_1 - g_1 - \mathbf{a}_{23}) + \mathbf{a}_{13} \ln \frac{n_1(g_1 + \mathbf{a}_{23}) + n_2(g_2 + \mathbf{a}_{23})}{n_3}$$

$$= \begin{cases} \left\{ w_1 - \left[\mathbf{a}_{13} - \left(1 + \frac{n_2}{n_1}\right) \mathbf{a}_{23} \right] - \mathbf{a}_{23} \right\} \\ + \mathbf{a}_{13} \ln \frac{n_1 \left[\mathbf{a}_{13} - \left(1 + \frac{n_2}{n_1}\right) \mathbf{a}_{23} \right] + n_2 \mathbf{a}_{23}}{n_3} & \text{if } \mathbf{a}_{13} > \left(1 + \frac{n_2}{n_1}\right) \mathbf{a}_{23} \\ (w_1 - \mathbf{a}_{23}) + \mathbf{a}_{13} \ln \frac{n_1 \mathbf{a}_{23} + n_2 \mathbf{a}_{23}}{n_3} & \text{if } \mathbf{a}_{13} \leq \left(1 + \frac{n_2}{n_1}\right) \mathbf{a}_{23} \end{cases}$$

$$= \begin{cases} w_1 + \mathbf{a}_{13} \left(\ln \frac{n_1}{n_3} \mathbf{a}_{13} - 1 \right) + \frac{n_2}{n_1} \mathbf{a}_{23} & \text{if } \mathbf{a}_{13} > \left(1 + \frac{n_2}{n_1}\right) \mathbf{a}_{23} \\ w_1 + \mathbf{a}_{13} \ln \frac{n_1 + n_2}{n_3} \mathbf{a}_{23} - \mathbf{a}_{23} & \text{if } \mathbf{a}_{13} \leq \left(1 + \frac{n_2}{n_1}\right) \mathbf{a}_{23} \end{cases}$$

$$(4.24b) \quad U_{p,2}^{k,t} = c_2 + \mathbf{a}_{23} \ln G$$

$$= (w_2 - g_2 - \mathbf{a}_{23}) + \mathbf{a}_{23} \ln \frac{n_1(g_1 + \mathbf{a}_{23}) + n_2(g_2 + \mathbf{a}_{23})}{n_3}$$

$$\begin{aligned}
&= \begin{cases} \frac{(w_2 - \mathbf{a}_{23}) + \mathbf{a}_{23} \ln \frac{n_1 \left[\mathbf{a}_{13} - \left(1 + \frac{n_2}{n_1}\right) \mathbf{a}_{23} + \mathbf{a}_{23} \right] + n_2 \mathbf{a}_{23}}{n_3}}{n_3} & \text{if } \mathbf{a}_{13} > \left(1 + \frac{n_2}{n_1}\right) \mathbf{a}_{23} \\ \frac{(w_1 - \mathbf{a}_{23}) + \mathbf{a}_{23} \ln \frac{n_1 \mathbf{a}_{23} + n_2 \mathbf{a}_{23}}{n_3}}{n_3} & \text{if } \mathbf{a}_{13} \leq \left(1 + \frac{n_2}{n_1}\right) \mathbf{a}_{23} \end{cases} \\
&= \begin{cases} w_2 + \mathbf{a}_{23} \left(\ln \frac{n_1}{n_3} \mathbf{a}_{13} - 1 \right) & \text{if } \mathbf{a}_{13} > \left(1 + \frac{n_2}{n_1}\right) \mathbf{a}_{23} \\ w_2 + \mathbf{a}_{23} \left(\ln \frac{n_1 + n_2}{n_3} \mathbf{a}_{23} - 1 \right) & \text{if } \mathbf{a}_{13} \leq \left(1 + \frac{n_2}{n_1}\right) \mathbf{a}_{23} \end{cases}
\end{aligned}$$

Referring to (4.11), let us check for the changes in the utility level of an individual in

each group. Firstly, we shall consider the case when $\mathbf{a}_{13} > \left(1 + \frac{n_2}{n_1}\right) \mathbf{a}_{23}$:

$$\begin{aligned}
(4.25a) \quad \Delta U_{p,1}^{k,t} &= U_{p,1}^{k,t} - U_{p,1}^k \\
&= \left[w_1 + \mathbf{a}_{13} \left(\ln \frac{n_1}{n_3} \mathbf{a}_{13} - 1 \right) + \frac{n_2}{n_1} \mathbf{a}_{23} \right] - \left[w_1 + \mathbf{a}_{13} \left(\ln \frac{n_1}{n_3} \mathbf{a}_{13} - 1 \right) \right] \\
&= \frac{n_2}{n_1} \mathbf{a}_{23}
\end{aligned}$$

$$\begin{aligned}
(4.25b) \quad \Delta U_{p,2}^{k,t} &= U_{p,2}^{k,t} - U_{p,2}^k \\
&= \left[w_2 + \mathbf{a}_{23} \left(\ln \frac{n_1}{n_3} \mathbf{a}_{13} - 1 \right) \right] - \left(w_2 + \mathbf{a}_{23} \ln \frac{n_1}{n_3} \mathbf{a}_{13} \right) \\
&= -\mathbf{a}_{23}
\end{aligned}$$

Now, we shall consider the other case when $\mathbf{a}_{13} \leq \left(1 + \frac{n_2}{n_1}\right) \mathbf{a}_{23}$:

$$\begin{aligned}
(4.26a) \quad \Delta U_{p,1}^{k,t} &= U_{p,1}^{k,t} - U_{p,1}^k \\
&= \left[w_1 + \mathbf{a}_{13} \ln \frac{n_1 + n_2}{n_3} \mathbf{a}_{23} - \mathbf{a}_{23} \right] - \left[w_1 + \mathbf{a}_{13} \left(\ln \frac{n_1}{n_3} \mathbf{a}_{13} - 1 \right) \right]
\end{aligned}$$

$$= \mathbf{a}_{13} \left[1 + \ln \left(1 + \frac{n_2}{n_1} \right) \frac{\mathbf{a}_{23}}{\mathbf{a}_{13}} \right] - \mathbf{a}_{23}$$

$$(4.26b) \quad \Delta U_{p,2}^{t,k} = U_{p,2}^{t,k} - U_{p,2}^k$$

$$= \left[w_2 + \mathbf{a}_{23} \left(\ln \frac{n_1 + n_2}{n_3} \mathbf{a}_{23} - 1 \right) \right] - \left(w_2 + \mathbf{a}_{23} \ln \frac{n_1}{n_3} \mathbf{a}_{13} \right)$$

$$= \mathbf{a}_{23} \left[\ln \left(1 + \frac{n_2}{n_1} \right) \frac{\mathbf{a}_{23}}{\mathbf{a}_{13}} - 1 \right]$$

In summary:

$$(4.27a) \quad \Delta U_{p,1}^{k,t} = \begin{cases} \frac{n_2}{n_1} \mathbf{a}_{23} & \text{if } \mathbf{a}_{13} > \left(1 + \frac{n_2}{n_1} \right) \mathbf{a}_{23} \\ \mathbf{a}_{13} \left[1 + \ln \left(1 + \frac{n_2}{n_1} \right) \frac{\mathbf{a}_{23}}{\mathbf{a}_{13}} \right] - \mathbf{a}_{23} & \text{if } \mathbf{a}_{13} \leq \left(1 + \frac{n_2}{n_1} \right) \mathbf{a}_{23} \end{cases}$$

$$(4.27b) \quad \Delta U_{p,2}^{k,t} = \begin{cases} -\mathbf{a}_{23} & \text{if } \mathbf{a}_{13} > \left(1 + \frac{n_2}{n_1} \right) \mathbf{a}_{23} \\ \mathbf{a}_{23} \left[\ln \left(1 + \frac{n_2}{n_1} \right) \frac{\mathbf{a}_{23}}{\mathbf{a}_{13}} - 1 \right] & \text{if } \mathbf{a}_{13} \leq \left(1 + \frac{n_2}{n_1} \right) \mathbf{a}_{23} \end{cases}$$

When $\mathbf{a}_{13} > \left(1 + \frac{n_2}{n_1} \right) \mathbf{a}_{23}$, we clearly observe that $\Delta U_{p,1}^{k,t} \geq 0$ and $\Delta U_{p,2}^{k,t} \leq 0$. The

tax policy has made the high altruism individual better off (in terms of utility), as the policy almost reinforces the Kantian motivation, such that everybody is now giving at a minimal uniform level.¹⁸ However, the low altruism individual is made worse off (in terms of utility) by the tax policy. Despite being able to enjoy more utility from the increased amount of public good, the need to pay the tax reduces his utility by the amount of the tax.

¹⁸ Unlike the ‘warm glow’ model, the supply of the public good may not have increased in this model. The ‘crowding-out’ effect may be in operation here. We shall examine this phenomenon in Section 5.2.

When $\mathbf{a}_{13} \leq \left(1 + \frac{n_2}{n_1}\right) \mathbf{a}_{23}$, the effect of the tax policy on the high altruism individual

is ambiguous. For the low altruism individual, $\Delta U_{p,2}^t \geq 0$ if $\frac{n_2}{n_1} \geq e \frac{\mathbf{a}_{13}}{\mathbf{a}_{23}} - 1$, and

$\Delta U_{p,2}^t < 0$ if $\frac{n_2}{n_1} < e \frac{\mathbf{a}_{13}}{\mathbf{a}_{23}} - 1$, where $e \approx 2.718$. The ratio of the individuals in the 2 groups

is thus important in determining whether the low altruism individuals are better off (in terms of utility) with the implementation of the tax policy.

There are 2 possible ways in which the tax policy may make the low altruism individual better off (in terms of utility). One way is for the number of low altruism individuals to be sufficiently large in relation to the other group, while the other way is for the low altruism individuals to increase the ‘price’ at which they value the public good.

Therefore, given the ‘correct’ proportions of high and low altruism individuals, and the ‘correct’ relative ‘prices’ of giving and of the public good, it is possible that all individuals can be made better off (in terms of utility) with the implementation of a tax policy to enforce compulsory transfer. One interesting implication which we can draw in our analysis here is that a constrained policy of compulsory transfer via taxation may have Pareto improving effects.

CHAPTER 5

DISCUSSION AND CONCLUSION

5.1 Analysis of the ‘Crowding-Out’ Effect

Warr (1982) and Roberts (1984) demonstrated that, in a public good model, government spending ‘crowds out’ private donations dollar for dollar, leaving total provision unchanged. This neutrality result has important implications for the impact of government spending designed to increase the supply of a public good. If this ineffectiveness holds, any attempt by the government to increase the supply of a public good through spending financed by taxes levied on contributors will fail, because an additional dollar of government spending results in an equal reduction in private contributions, until the non-negativity constraint on the latter becomes binding.¹⁹

On the other hand, Bergstrom *et al.* (1986) showed that if taxes are levied on non-contributors, or if contributors are taxed by more than their private contribution, total provision of the public good may be increased by tax-financed spending.²⁰ As such, the ‘crowding-out’ effect is partial rather than total.

Andreoni (1989, 1990) argued that giving a dollar through compulsory transfer via taxation is not a perfect substitute for giving a dollar directly to the less fortunate. This is because the act of giving generates the ‘warm glow’ effect, which cannot be derived from simply paying the tax. As a result, perfect ‘crowding-out’ might not occur, and government intervention may not be entirely futile.

Given the different qualifications, it is necessary to check the intensity of the ‘crowding-out’ effect in our models. We shall determine the levels of public good produced

¹⁹ This ineffectiveness is referred to as the Ricardian Equivalence Theorem (Warr, 1982).

²⁰ While Bergstrom *et al.* similarly examined the effect of compulsory transfer via taxation on the level of giving by contributors and non-contributors, their model did not allow for the ‘warm glow’ effect or for ‘group Kantianism’. Furthermore, their model only captures the situation where there is a small number of individuals, and they did not reflect the effect of compulsory transfer via taxation on the utility levels of the individuals.

in both the ‘warm glow’ and ‘group Kantianism’ initially and after the individuals are subject to the tax policy. The results are summarised as follows:

Table 5.1

SUMMARY OF SUPPLY LEVELS OF THE PUBLIC GOOD

Model	Without Tax	With Tax
Pareto Optimal	$G^* = \frac{n_1 \mathbf{a}_{13} + n_2 \mathbf{a}_{23}}{n_3}$	$G^{t,*} = \frac{n_1(\mathbf{a}_{13} + \mathbf{a}_{23}) + 2n_2 \mathbf{a}_{23}}{n_3}$
‘Warm Glow’	$G = \frac{n_1}{n_3} \mathbf{a}_{12}$	$G^t = \frac{n_1 \mathbf{a}_{12} + n_2 \mathbf{a}_{23}}{n_3}$
‘Group Kantianism’	$G^k = \frac{n_1}{n_3} \mathbf{a}_{13}$	$G^{k,t} = \frac{n_1}{n_3} \mathbf{a}_{13}$

From Table 5.1, we realise that there is an interesting implication. The ‘crowding-out’ effect is partial in our ‘warm glow’ model, but it is total in our ‘group Kantianism’ model. This reinforces Andreoni’s argument that that act of giving generates the ‘warm glow’ effect, which is a strong motivation for individuals to still contribute a significant amount of private gifts, despite having to pay the tax. This results in an increased level of the public good.

In the ‘group Kantianism’ model, the compulsory transfer via taxation ‘crowds out’ private donations dollar for dollar, leaving total provision of the public good unchanged. The Kantian motivation may be the cause for this effect. Since the tax may be acting as the uniform level of giving that the Kantian believes everybody should contribute, this may cause the individual to reduce his own level of private giving, hence resulting in the total ‘crowding-out’ effect.

5.2 Encouraging the Giving Behaviour

5.2.1 Increasing Social Awareness

More efficient and socially desirable outcomes may be possible through a systemic cultivation of the social mindset. Such outcomes are possible if more individuals in society, especially those who are currently free-riding, fully embrace the Kantian motivation towards

giving (Collard, 1978; Sugden, 1984). Public education, moral suasion and publicity campaigns help increase social pressure whilst projecting the objective of charitable giving as worthy. If the free rider can be made more aware and sympathetic of the plight of the less fortunate, this would help raise the value which he places on the 'price' of the public good in the 'warm glow' framework.

However, Kant's moral form of motivation is unlikely to be widely accepted if others do not, in practice, make those contributions which the individual believes they should. Unless that Kantian principle is widely accepted as a basis for behaviour, its impact on the voluntary provision of public goods is unlikely to be substantial.

5.2.2 *Provision of Tax Incentives*

Recent studies on charitable giving in Singapore reported that private giving is highly responsive to changes in the 'price' of giving.²¹ A policy that reduces the 'price' of giving can have positive effect on the individual's level of generosity, thus having strong beneficial effects on the level of consumption and the well-being of the less fortunate.

To the extent the altruist does not receive goods or services in exchange for the donation, the government can entitle altruists to tax exemption and deduction, so as to reduce his 'price' of giving. Donors in Singapore, for example, are entitled to double tax deductions (twice the donation value) for such donations made on or after 1 January 2002.²² For instance, a \$100 charitable donation will entitle the donor to tax deductions for the amount of \$200.

Besides deductibility, there are other tax provisions which the government may consider implementing to help increase the level of giving. One such tax provision is the change in tax rates. As there would be an income effect discouraging private giving and a substitution effect encouraging private giving, the net effect of a given tax increase would depend on the size of the individual's income and price elasticities.

²¹ Wong *et al.* (1998); Chua & Wong (1999).

²² Inland Revenue Authority of Singapore (2002).

5.2.3 *Provision of Private Incentives*

Culyer (1973, 53) has suggested that private incentives be provided for localised and public needs. Raffles, tombolas and other ‘unfair’ gambles are well-established and familiar methods of overcoming, to a degree, the problem of financing collectively-felt needs. Another time-honoured method is publicising the names of contributors and the sums contributed. However, it is ironic that we should accept such ideas. Despite encouraging the free riders to play a more active role, contributions would be regarded as conditional upon the receipt of personal rewards.

5.3 **Conclusion**

Alleviating poverty through charitable giving benefits not just the poor, but also the rest of society. It strengthens peace and stability, global health and market efficiency, apart from its intrinsic value. Both altruist groups hence derive positive external benefits in form of a higher social well-being. If a generous altruist makes a gift to the public good, the gift also generates positive external benefits for the all other altruists, including those people who care for the well-being of the less fortunate but do not contribute. As such, the production of the public good generates positive external benefits for a large number of other individuals.

The existence of contributors and non-contributors in reality show the necessity to include heterogeneous preferences in the study of the charitable giving. In our paper, we have managed to examine the effect of heterogeneity in not just one model, but in two different frameworks, each with its own motivations and merits. Both models show us that the ratio of high altruism individuals to low altruism individuals, as well as the relative ‘prices’ of giving and the public good, are important in allowing us to more accurately ascertain the relative change in well-being of the individual (in terms of utility) when a policy of compulsory transfer via taxation is implemented. Such government intervention may be desirable due to its Pareto-improving nature. We shall present the results of our study in 2 summarised tables for easier reference.

Table 5.2

SUMMARY OF PRIVATE OPTIMAL LEVELS OF GIVING

Optimum	'Warm Glow'		'Group Kantian'	
	Without Tax	With Tax	Without Tax	With Tax
$g_{s,1}^*$	a_{13}			
$g_{s,2}^*$	a_{23}			
$g_{p,1}^*$	a_{12}	$a_{12} - a_{23}$ <i>if</i> $a_{12} \geq a_{23}$	a_{13}	$a_{13} - \left(1 + \frac{n_2}{n_1}\right) a_{23}$ <i>if</i> $a_{13} > \left(1 + \frac{n_2}{n_1}\right) a_{23}$
		0 <i>if</i> $a_{12} < a_{23}$		
$g_{p,2}^*$	0	0	0	0

Table 5.3

SUMMARY OF CHANGE IN UTILITY LEVELS OF INDIVIDUALS

Change	Constraint	High Altruism	Low Altruism
ΔU_p^t	$a_{12} \geq a_{23}$	> 0	≥ 0 <i>if</i> $\frac{n_2}{n_1} \geq (e-1) \frac{a_{12}}{a_{23}}$ < 0 <i>if</i> $\frac{n_2}{n_1} < (e-1) \frac{a_{12}}{a_{23}}$
	$a_{12} < a_{23}$	ambiguous	≥ 0 <i>if</i> $\frac{n_2}{n_1} \geq e \frac{a_{12}}{a_{23}} - 1$ < 0 <i>if</i> $\frac{n_2}{n_1} < e \frac{a_{12}}{a_{23}} - 1$
$\Delta U_p^{k,t}$	$a_{13} > \left(1 + \frac{n_2}{n_1}\right) a_{23}$	≥ 0	≤ 0
	$a_{13} \leq \left(1 + \frac{n_2}{n_1}\right) a_{23}$	ambiguous	≥ 0 <i>if</i> $\frac{n_2}{n_1} \geq e \frac{a_{13}}{a_{23}} - 1$ < 0 <i>if</i> $\frac{n_2}{n_1} < e \frac{a_{13}}{a_{23}} - 1$

When deciding whether the tax policy is required, economists will check whether individuals are better off (in terms of utility) with the tax policy. If the high altruism individuals are better off and the low altruism individuals are worse off, economists would

argue for the tax policy as it is Pareto-improving. However, one should consider whether it is fair for the low altruism individuals be subjected to the tax policy, despite become worse off after paying their tax. To most moralists, they would regard such a tax policy as beneficial to society, as more supply of the public good may be made available to the less fortunate, despite it being at the expense of the low altruism individuals. Even if it is not Pareto-improving, for reasons of social justice and humanitarian ethics, it is only honourable for everybody to provide private gifts, either voluntarily or enforced through taxation, to alleviate poverty and relieve the suffering of the less fortunate and disadvantaged.

"Philanthropy is commendable, but it must not cause the philanthropist to overlook the circumstances of economic injustice which make philanthropy necessary."

- Martin Luther King, Jr

APPENDIX

Table A1.1

GIVING IN SINGAPORE:

TOTAL & AS PERCENTAGE OF TAXABLE INCOME (1992-2000)

Year	Gifts to Approved Institutions (\$)	Total Income for Taxable Individuals & Companies (\$)	Giving as % of Total Income
1992	32,009,696	47,635,614,367	0.0672
1993	38,693,508	51,188,474,129	0.0756
1994	37,503,854	43,784,462,082	0.0857
1995	41,464,755	46,589,300,433	0.0890
1996	43,559,933	53,791,024,396	0.0810
1997	51,049,080	63,060,306,063	0.0810
1998	69,425,380	80,174,323,014	0.0866
1999	67,963,918	81,451,946,405	0.0834
2000	79,712,000	87,360,950,000	0.0912

Notes:

1. Dollars are inflation-adjusted to values in the year 2000.
2. Data on income tax collection was first published in the IRAS Annual Report 1992.
3. 'Gifts to Approved Institutions' refer to gifts of the following kinds:
 - (a) approved gifts to an approved museum;
 - (b) outright cash donation made to the government or approved Institutions of Public Character;
 - (c) an amount equivalent to the value of any gift of a computer made by any company to a prescribed educational or research institution in Singapore; and
 - (d) shares of public companies listed on the Singapore Exchange or units in unit trusts that are readily tradable in Singapore.

Source: Author's calculations, data from Inland Revenue Authority of Singapore (1993-2001).

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