Introducing Virtue Ethics into Normative Economics for Models with Endogenous Preferences

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Background

- **Positive economics**: how scarce resources *are* allocated
- **Normative economics**: how scarce resources *should* be allocated
- Normative economics requires ethical views

ABSTRACT

- An important role of normative economics: to provide an analytical framework to evaluate social states based on value judgments derived from moral views of the members of the society.
- There exist three major approaches in normative ethics, which formalize many people's moral views
  1. Consequentialism (e.g. Utilitarianism, Welfarism)
  2. Deontology (An ethical theory that emphasizes moral duties: e.g. duties for fairness and justice)
  3. Virtue Ethics (An ethical theory that emphasizes virtue: two aspects)
     1. learning aspect (acquiring virtues)
     2. flourishing aspect (human flourishing by using virtues and abilities)

ABSTRACT-continued

- Among these, formal analytical frameworks have been developed for important aspects of consequentialism, deontology, and the flourishing aspect of virtue ethics.
- However, normative economics does not have a formal analytical framework for the learning aspect of virtue ethics.
- The purpose of this paper is to develop such a framework for models with endogenous preferences.

1. Introduction: The reason why the learning aspect of virtue ethics is twofold - First

- It is important to incorporate an ethical view that values building up *communities*
- Among the three major approaches in normative ethics, virtue ethics puts highest values to *communities*
- The learning aspect of virtue ethics values building up communities.
- Some economists have argued that communities are important now because of the recent social problems such as worsening inequality, the rise of populism, low fertility, aging, and natural catastrophes.

1. Introduction: Rajan's (2019) book *Third Pillar*-populism against globalization

- Raghuram Rajan, former IMF chief economist
- Third pillar is *community*.
  - Three key forces of the world is the market, the state, and the community.
  - As the economy and the state become stronger, society has serious problems with inequality, populism, etc.
  - Rajan argues to strengthen and empowering local *communities* to regain sound *balance* for the three key forece.

1. Introduction: Hayami's (2009) state, market, and community mechanisms

- Hayami(2009) explains that the economic system consists of three major components:
  1. the state mechanism
  2. the market mechanism
  3. the community mechanism
- This framework of thinking is similar to Rajan's

1. Introduction: Ogaki and Ohtake (2019) on low fertility and aging

- Ogaki and Ohtake (2019) argues that the community mechanism will become important again in high income countries because of the low fertility and aging in many countries
  - a large fraction of the population in each country will have cognitive ability declines either as a normal aging process or as dementia
  - the child care service becomes more important as female labor participation increases
  - An old person whose cognitive ability has severely declined, or a child cannot effectively use the market mechanism alone
  - The community mechanism will gain importance again as in low income countries
  - an important problem is how the market and *community* mechanisms should be combined for the society

1. Introduction: The reason why the learning aspect of virtue ethics is twofold - Second

- The learning aspect of virtue ethics is important because many people use it in their everyday lives to think about ethical issues.
- For example, consider a child who wants to engage in the smoking (or consumption of a highly addictive drug).
  - He wants to do this after carefully weighing future costs and benefits of forming preferences with addiction for smoking
  - The parent of that child may not want the child to form such preferences.
- Behind this value judgment, there is an element of virtue ethics that one should cultivate preferences that are ethically better.

1. Introduction: Method

- For the learning aspect of virtue ethics which values building communities,this paper develops an analytical framework by combining three methods: we use
  1. Models with *endogenous preferences*.
  2. The meta-preference approach (some preferences are morally better than others)
  3. The modified criteria approach (e.g., the weak Pareto criterion is modified)

Our approach is based on

1. Modifying the Pareto criterion and adding new criteria (e.g., the modified Pareto Criterion, which Bhatt, Ogaki, and Yaguchi (2015) adapted from Temkin's (2011) modification)
2. Adding new functions to Social Welfare Function (SWF) , W (For a social-state evaluation framework that balances **virtue ethics** and the welfarism incorporated in SWF)
    1. Moral Evaluation Function (MEF), M, for virtue ethics
    2. Social Objective Function (SOF) $S = F(M, W)$ for a balanced evaluation based on both MEF and SWF

- illustrates our approach by two examples
  1. A rational addiction model (Becker and Murphy 1988)
  2. A model of intergenerational altruism with endogenous time preferences (Bhatt and Ogaki 2012)

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2. Related Literature

Our framework combines two types of literatures in economics;

1. Literature on endogenous preferences
2. Literature on introducing moral considerations other than welfarism into normative economics
    1. The Pareto criterion is violated when other moral considerations are introduced (Sen's (1970) liberal paradox, Kaplow and Shavel's (2001) result that the Pareto criterion is violated when any other moral considerations are introduced.)
    2. The meta-preference

2. Related Literature - 1. Literature on endogenous preferences

Many theoretical and empirical studies on models with **endogenous preferences**

- Addiction models and related Habit Formation models (finance, macro)
- Endogenous reference points (e.g., Prospect theory, Koszzegi and Rabin 2006)
- Intergenerational cultural preference transmission and formation
  - E.g. Doepke and Zilibotti's (2017) theory and empirical evidence on parenting and endogenous time preferences
- Economics of education (some preferences are non-cognitive abilities)
  - E.g. Heckman and Kauts (2014) for a survey and Alan and Ertac (2018) for experimental evidence on school education and endogenous time preferences

Two Difficulties in Normative Economics of Models with Endogenous Preferences

1. Preference ordering conditional on endogenous economic variables cannot be used as a yardstick for evaluation of social states.
    - In order to overcome this difficulty, Pollak (1978) defines unconditional preference ordering.
2. Given that we have many preferences, some preferences may be considered “better” in terms of virtue ethics (Meta-preferences)
    - Even though the unconditional preference ordering is desirable in terms of exogeneity, it does not have to be the preference ordering that is most preferred in terms of virtue ethics.

2. Related Literature - 2. Literature on introducing moral considerations other than welfarism into economics

- Two difficulties
  1. The (weak) Pareto criterion is violated when other moral considerations are introduced (Sen's (1970) liberal paradox, Kaplow and Shavel's (2001) result that the Pareto criterion is violated when any other moral considerations are introduced.)
     - We use the modified Pareto criterion
  2. How can the learning aspect of virtue ethics be formalized?
     - We adapt the framework of meta-preferences (see, e.g., Sen (1974, 1977) and George (1984), In this framework, moral judgments are expressed by rankings of preference rankings.)

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3. Reformulating Normative Economics to Introduce Virtue Ethics

- Consider an economy with N agents.
- x: a social state
- $U_i(x)$: an unconditional utility function of agent i
- $\psi_i(x)$: a function that express properties of the endogenous utility function of agent i.
- An individualistic social welfare function. $W(U_1(x), ..., U_N(x))$: a social welfare function.
- The moral evaluation function (MEF): a function $M(\psi_1(x), ..., \psi_i(x); \psi^*)$ that evaluates deviations of $(\psi_1(x), ..., \psi_i(x))$ from perfect virtue, ψ^*.
- The social objective function(SOF): $S(M(x), W(x))$ is a function that evaluates social states by considering both the virtue ethics aspect and the welfarism aspect.

The Criteria

- In order to apply this framework to economic models, we need criteria.
- The weak Pareto criterion is based on evaluation of social states that is solely based on welfarism, so we need to modify it in order to add another ethical consideration of virtue ethics.
- Following the companion paper (JER, 2015), we adapt Temkin's (2011, p.408) modification of the Pareto criterion.

Definition

The Modified Weak Pareto Criterion: Given two social states x and y, if everyone strictly prefers x to y, then x should be evaluated to be better than y for the society as long as x is not evaluated to be worse than y in terms of other ethically relevant factors.

By adding the last part starting from "as long as" to the definition of the weak Pareto criterion, we allow a possibility that other ethically relevant factors such as deterioration of virtues to outweigh the factor of welfarism.

We model moral virtues by placing preferences based on virtue ethics over conditional preferences:

Definition

The Criterion of the Virtue Ethics: Given two social states x and y, if at least one person's conditional preference ordering is strictly better in terms of virtue ethics and everyone else's conditional preference ordering is at least as good in terms of virtue ethics in x than in y, then x should be evaluated to be better.

In order to combine welfarism and virtue ethics, we need to modify this criterion, too.

Definition

The Modified Criterion of the Virtue Ethics: Given two social states x and y, if at least one person's conditional preference ordering is strictly better in terms of virtue ethics and everyone else's conditional preference ordering is at least as good in terms of virtue ethics in x than in y, then x should be evaluated to be better as long as x is not evaluated to be worse than y in terms of other ethically relevant factors.

- SWF needs to satisfy the Weak Pareto Criterion
- MEF needs to satisfy the Criterion of Virtue Ethics
- SOF needs to satisfy both the Modified Weak Pareto Criterion and the Modified Criterion of Virtue Ethics

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4. Rational Addiction and Virtue Ethics

- Two goods: an addictive good (a_t) and a non-addictive good (c_t)
- the stock of past consumption of the addictive good denoted by S_t.

$$S_{t+1} = (1 - d)S_t + a_t \quad t = 0, 1 \tag{1}$$

where d if the rate of depreciation of the stock.

- the period t instantaneous utility

$$u_t = u(c_t, a_t, S_t) \quad t = 0, 1 \tag{2}$$

$\frac{\partial^2 u(c_t, a_t, S_t)}{\partial a_t \partial S_t} > 0$, the addictive nature of the good.

Environment

- Many identical consumers with

$$u(c_0, a_0, S_0) + \beta(u(c_1, a_1, S_1)) \tag{3}$$

Assume that $S_0 = 0$. (no addiction stock in period 0)

Environment-continued

- Endowment of the nonaddictive good in t=0 only, one unit of which can be transformed into R units of the nonaddictive good at t=1 by a linear technology
- In each period, one unit of the nonaddictive good can be transformed int p_t units of the addictive good by a linear technology.

Competitive Markets

- p_t: the exogenous world price of the addictive good and the price of the non-addictive good is normalized to 1.
- y_0: the exogenously given income in period 0 from the endowment
- τ: the tax rate for the addiction good
- z_t: a lump sum subsidy every period (fixed from the individual point of view)
- $z_t = \tau a_t$: the government budget is assumed to be balanced in each period

$$p_0 a_0 + \frac{p_1 a_1}{R} + c_0 + \frac{c_1}{R} = y_0 - \tau(a_0 + \frac{a_1}{R}) + z_0 + \frac{z_1}{R} \tag{4}$$

In period 0, the consumer maximizes the utility function given S_0

$$\max_{c_0, c_1, a_0, a_1} u(c_0, a_0, S_0) + \beta(u(c_1, a_1, S_1)) \tag{5}$$

$$\textit{subject to } (4)$$

Unconditional and Conditional Utility Functions

- The unconditional utility function, which represents her *unconditional preference ordering* is defined by the following expression for an allocation $x = c_0, a_0, c_1, a_1)$

$$U(x) = u(c_0, a_0, 0) + \beta(u(c_1, a_1, a_0)) \tag{6}$$

- Given a particular value Q for the state variable of the stock of the addictive good, S_1, conditional utility function, which represents *conditional preference ordering*, is given by the following expression:

$$U(x|S_1 = Q) = U(x) = u(c_0, a_0, 0) + \beta(u(c_1, a_1, Q)) \tag{7}$$

SWF, MEF, SOF

- SWF

$$W(x) = U(x) \tag{8}$$

- MEF: given by the idea that preferences with less addiction (less $S_1 = a_0$ are better.

$$M(a_0) \qquad where \quad M'(a_0) < 0 \tag{9}$$

- SOF

$$S(x) = F(M(x), S(x)) \tag{10}$$

where

$$F_1 = \frac{\partial S}{\partial M} \geq 0 \quad and \quad F_2 = \frac{\partial S}{\partial W} \geq 0 \tag{11}$$

- $x(\tau)$: the equilibrium value of x when the tax rate is set to τ with the government budget constraint.
- $a_t^*(\tau, z_0, z_1)$: optimum value for the consumer given τ, z_0, z_1
- $z_t^*(\tau)$: the equilibrium value

Proposition

The optimum tax rate on addictive good consumption is not zero as long as where $\tau = 0$ and $F_1 > 0$, $\left[\frac{\partial a_0^*}{\partial \tau} + a_0^* \frac{\partial a_0^*}{\partial z_0^*} + a_1^* \frac{\partial a_0^*}{\partial z_1^*}\right] \neq 0$, and the consumer's optimization is obtained with interior solution. Furthermore,

1.1. If $\left[\frac{\partial a_0^*}{\partial \tau} + a_0^* \frac{\partial a_0^*}{\partial z_0^*} + a_1^* \frac{\partial a_0^*}{\partial z_1^*}\right] < 0$ then the optimal tax rate is positive.

1.2. If $\left[\frac{\partial a_0^*}{\partial \tau} + a_0^* \frac{\partial a_0^*}{\partial z_0^*} + a_1^* \frac{\partial a_0^*}{\partial z_1^*}\right] > 0$ then the optimum tax rate is negative.

- For this model, introducing virtue ethics means more government intervention.

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5. Tough Love Altruism with Bequest Motive

- This model gives an example in which introducing virtue ethics means *less* government intervention.
- For this example, we introduce a bequest motive for the parent into Bhatt and Ogaki's (2012) tough love altruism model.

5.1. Model Economy

The environments in the model

- 3 agents; the parent, the child, and the government
- 3 periods (childhood, work, and retirement for the child)
- The life of the parent and the child overlaps in the first two periods of the child's life.
- The parent not only cares about his own consumption, but is also altruistic toward the child: He assigns a weight of θ to the child's lifetime utility, where $0 < \theta < 1$.
- the parent receives an exogenous income, denoted by y^P, in period 1
- The parent receives no income in the last period of his life but simply divide savings from the previous period into his own consumption and bequest, which is taxed by the government.
- The parent maximizes utility over the last two periods of his life by choosing consumption in period 1 C^P, inter-vivos transfers (T), and bequest B, respectively.

- y_2^K: child's second period exogenous income, and we assume that she receives no income in the first and last period of her life.
- The child is assumed to be a non-altruist and derives utility only from her own consumption stream $\{C_t^K\}_{t=1}^3$
- The child's childhood consumption is assumed to be equal to the parent's inter-vivos transfers by social convention (alternatively, the child is assumed to be borrowing constrained in period 1 with a binding constraint).
- There is no uncertainty in the economy.
- The government collects the bequest tax from the parent (τ is the bequest tax rate), and gives s as a lump sum subsidy. We assume that $\tau B = s$.
- $x = (C_2^P, C_3^P, C_1^K, C_2^K, C_3^K)'$: an allocation in this economy.

Two important features of the tough love model

1. The child's time discount factor is endogenous:

$$\beta_K(C_1^K) \quad ; \quad \frac{d\beta_K}{dC_1^K} < 0.$$

   If the child is spoiled by consumption of too many toys and sweets in her childhood, then she will grow to be impatient.

2. The parent does not use the child's endogenous discount factor. but uses a constant discount factor, β_P to evaluate the child's lifetime utility,:

$$U_P(x) = u(C_2^P) + \widetilde{\beta} u(C_3^P) + \theta\left(u(C_1^K) + \beta_P u(C_2^K) + \beta_P^2 u(C_3^K)\right) \quad (12)$$

- $\widetilde{\beta}$ is the parent's own discount factor
- β_P is the discount factor used to evaluate the child's future utility, and represents the parent's value judgment as to how patient the child should grow to be.
- **Tough Love Motive** and **Temptation**: If β_P is sufficiently high, then the parent thinks that the child should grow to be patient, but is tempted to spoil the child.

Unconditional and Conditional Preference Orderings

The child's unconditional utility function that represents *unconditional preference ordering* is assumed to be

$$U_K(x) = u(C_1^K) + \beta_K(C_1^K)u(C_2^K) + \beta_k(C_1^K)^2 u(C_3^K). \tag{13}$$

Given the state variable of the parent's transfer, T, the child's conditional utility function that represents *conditional preference ordering* is

$$U_K(x|T) = u(C_1^K) + \beta_K(T)u(C_2^K) + \beta_k(T)^2 u(C_3^K). \tag{14}$$

The parent's optimization problem

The parent solves:

$$\max_{C^P,T,B} \left[u(C^P) + \widetilde{\beta}u(R(y^P - C^P - T) - B)\right]$$
$$+\theta\Big[u(T) + \beta_P u(C_2^{K*}) + \beta_P^2 u(R(y_2^K + (1-\tau)B + s - C_2^{K*}))\Big], \quad (15)$$

subject to:

$$\left\{C_2^{K*}\right\} \equiv \arg\max_{C_2^K} \left[u(C_2^K) + \beta_K(T)u(R(y_2^K + (1-\tau)B + s - C_2^K))\right]. \quad (16)$$

where R is the gross interest rate.

The bequest tax rate affects the child's preferences

- In our framework, the government influences the child's patience when it imposes a nonzero bequest tax rate.
- If the bequest tax rate is reduced, then the parent has more incentives to leave bequests than to make transfers to the child. Lower transfers in turn would imply a higher discount factor (more patience) for the child.
- It should be noted that the government's objective to set the bequest tax rate may not have anything to do with affecting the child's preferences, but any nonzero tax rate is affecting her preferences.

5.2. Simulation Results

- We use the tough love altruism model to illustrate what we view as important limitations of the concept of Pareto efficiency for the models with endogenous preferences.
- We will present simulation results of the model with particular parameterizations.
- Using numerical methods we show that under certain parametric specifications a policy that gives a Pareto improvement in terms of the child's unconditional preference ordering may not be desirable to a child who has grown up to be patient.
- We argue that a reasonable value judgment may not agree with that by the Pareto improvement.

$$u(x) = \frac{x^{1-\sigma}}{1-\sigma}. \tag{17}$$

The discount factor is given by:

$$\beta_K(T) = \beta_0 + \frac{1}{1+aT} \quad \textit{where} \quad a > 0 \textit{ and } \beta_0 \leq 0. \tag{18}$$

Our Approach Applied to the Tough Love Model

- SWF

$$W = U_p + U_k \tag{19}$$

- MEF

$$M = -(\beta_K(T) - 1)^2 \tag{20}$$

- SOF: we adapt Kaneko and Nakamura's (1979) Nash SWF to the SOF.

$$S = (M - \overline{M})^{\alpha} \times (W - \overline{W})^{1-\alpha} \tag{21}$$

  - α is the parameter of the S that decides the weight given to virtue ethics and welfare considerations.
  - $\overline{S}$ is the SWF value for the worst scenario.
  - $\overline{M}$ is the MEF value for the worst scenario.

Table: Table 1: SOF vs SWF: Tough Love Altruism

τ	-0.5	-0.15	0	0.15	0.2
β_K	0.3195	0.3107	0.3166	0.3024	0.3010
$SOF(\alpha = 0)$	80.7976	80.9228	80.9597	80.9785	**80.9790**
$SOF(\alpha = 0.01)$	77.1939	77.3012	77.3309	**77.3431**	77.3417
$SOF(\alpha = 0.05)$	64.3164	64.3645	**64.3706**	64.3620	64.3546
$SOF(\alpha = 0.075)$	57.3831	**57.4029**	57.3980	57.3799	57.3698
$SOF(\alpha = 1)$	**0.8431**	0.8310	0.8254	0.8195	0.8176

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6. Conclusion

- In the approach we proposed, moral value ethics is used in combination with welfarism.
- In the example of a rational addiction model, the optimal tax rate for the addictive drug is positive even when there is no externality.
- Many economists seem to think that virtue ethics is not desirable for public policy evaluations because they do not want the government to influence people's preferences.
- However, in our tough love model:
  1. The optimum tax rate is positive when the SWF is maximized.
  2. On the other hand, the optimum tax rate is zero when the SOF is maximized with $\alpha = 0.3$.
- Thus, introducing virtue ethics in normative economic analysis does not necessarily imply a greater role for the government in the market

5. Conclusion - continued

- Based on our findings two important areas for future research are:

  1. Empirical evidence validating endogeneity of preferences
     - For rational addiction model there is a large literature on empirical validity of this framework (e.g., see Gruber(2001))
     - For the tough love model with the bequest tax rate, there already exit some empirical work
       - Using a unique data set of twins in Japan, Hirata et al. (2009) found empirical evidence that genetic factors do not completely determine time discounting.
       - Kubota et al. (2013, 2014) find empirical evidence that is consistent with the tough love model, using unique survey data for U.S. and Japan.
       - Akabayashi et al. (2014) used a unique data of experiment for child-parent pairs and find support for tough love model

- We believe it is important to investigate empirical evidence for endogeneity of a wide variety of economic preferences

5. Conclusion - continued

2. Empirical evidence on public policy affecting preferences of individuals
   - Ito et al. (2015) find that people who experienced participatory/cooperative learning process in their elementary schools in Japan tend to form more altruistic preferences.
   - Thaler and Sunstein (2009) provide several examples of how public policy can affect social norm, and hence influence individual behavior and conditional preference orderings
     - Montana used data on teenage smoking and ran a successful advertisement campaign called “Most (71 percent) of Montana teens are tobacco free” with the objective of influencing the social norms regarding smoking by correcting the social perceptions about such consumption.
     - Sacramento Municipal Water District provided a comparison with the energy use of neighbors in the monthly energy bills for users, ranking them as “great”, “good”, or “below” average in comparison to their neighbors.

Child-Parent-Pair Experiment by Akabayashi et al. (2014, a progress report for Japanese data; currently analyzing both Japanese and US data)

- Panel data sets of experiment for child-parent pairs in Japan and USA
- Three sets of time-preference elicitation experiments to each child-parent pair in which payments are always given to the child
  1. Child alone - individual decision
  2. Parent alone - individual decision
  3. Child-Parent joint decision

Child-Parent-Pair Experiment by Akabayashi et al.-Continued

- Preliminary Result 1 (Conflicts of interests): Barro-Becker intergenerational altruism model with private information about the child's time preference predicts that what the child prefers dominates when the child and parent negotiate because there is no conflict of interests (This result can be obtained by cross-sectional data)
- Preliminary Result 2 (Support for models of parenting to affect the child's discount factor such as the tough love model): The children of the parents with more patient decisions tend to become more patient over time. (This result requires panel data).

An Application to a Work-Life Balance Model

Model: A Model of Endogenous Altruism toward Own Child

- two periods
- three agents: a representative decision maker, a representative child, and the government.
- In the first period, the choice is to allocate this time between labor (L) and resource (R_K).
- We interpret L to denote human capital and R_K to denote resources needed (e.g., time spent with the child) to become altruistic.
- The decision maker's input of L generates an output which we denote by Y:

$$Y = F(L) \text{ where } F' > 0 \text{ and } F'' \leq 0 \tag{22}$$

The resource constraint for the decision maker is given by:

$$R_K + L = 1 \tag{23}$$

- In the second period, the decision maker chooses to spend his income Y between consumption C_A and transfer to the child (T).
- child's consumption: C_K

$$C_K = T$$

The preferences of the decision maker in period 2 are given by,

$$u(C_A, C_K | R_K^*) = u_A(C_A) + \theta(R_K^*) u_K(C_K) \tag{25}$$

- The government collects income tax at a rate of τ and provides a lump-sum subsidy of z.
- Hence, the choice of C_A and T is constrained by:

$$(1-\tau) \times F(1-R_K) + z = C_A + T \tag{26}$$

the government budget is balanced implying $z = \tau \times F(1 - R_K)$.
the decision-maker solve the following maximization problem in period 2:

$$\max_{C_A, T} [u_A(C_A) + \theta(R_K^*) u_K(T)] \tag{27}$$

$$s.t. \tag{28}$$

$$(1 - \tau) \times F(1 - R_K^*) + z = C_A + T$$

$$u_A(x) = u_K(x) = \frac{x^{1-\sigma}}{1-\sigma} \tag{29}$$

$$F(L) = \delta_0 + \delta_1 \times L^{\delta_2} \tag{30}$$

$$\theta(R_K) = \phi_0 \times (1 - e^{-\phi_1 \times R_K}) \tag{31}$$

The social welfare function (SWF):

$$SWF \;=\; u_A(C_A) + u_K(C_K) \tag{32}$$

The moral evaluation function (MEF):

$$MEF = -\left(\theta(R_K) - 1\right)^2 \tag{33}$$

The worst case scenarios;

$$\overline{SWF} \;=\; u_A(C_{A,0}) + u_K(C_{K,0}) \tag{34}$$

$$\overline{MEF} = -\left(\theta(-1)^2\right. \tag{35}$$

$$SOF = (MEF - \overline{MEF})^{\alpha}(SWF - \overline{SWF})^{(1-\alpha)} \tag{36}$$

Table 1: SOF vs SWF

Global Parameters

$\delta_0 = 1.1$; $\delta_1 = 4$; $\delta_2 = 0.7$; $\phi_0 = 1.8$; $\phi_1 = 1$; $\sigma = 0.7$

Panel A: Optimal Consumption Stream and Altruism

τ	C_A^*	C_K^*	$\theta(R_K^*)$
-0.2	1.6100	1.3362	0.8777
0	1.4508	1.2939	0.9230
0.1	1.3681	1.2645	0.9464
0.3	1.1935	1.1842	0.9946

Panel B: Evaluating Alternative Tax Policies

τ	$SOF(\alpha = 0)$	$SOF(\alpha = 0.4)$	$SOF(\alpha = 0.6)$	$SOF(\alpha = 1)$
-0.2	**10.6727**	4.1148	2.5549	0.9850
0	10.6523	**4.1251**	2.5670	0.9941
0.1	10.6230	4.1233	**2.5689**	0.9971
0.3	10.5094	4.1015	2.5623	**1.0000**

Growth and Community

- This example can be interpreted as a model of trade-off between growth and the better family community
- In most high income countries, the community mechanism has been rapidly replaced by the market and state mechanisms
- Both high income and low income countries may benefit from thinking about how to maintain and activate the community mechanism