Incentive Effects of Inheritances and Optimal Estate Taxation

Wojciech Kopczuk[1]

January 14, 2013

[1]Wojciech Kopczuk: Columbia University, email address: wojciech.kopczuk@columbia.edu.
This paper is prepared for May 2013 issue of the American Economic Review: Papers and Proceedings. I am grateful to Russell James, Rob McClelland, Emmanuel Saez, Bernard Salanie and Dan Silverman for helpful comments

Abstract

I consider optimal nonlinear taxation of income and bequests with a joy-of-giving bequest motive and explicitly characterize the optimal estate tax rate. The optimal formula trades off correction of externality from giving and discouraging effort of children due to income effect generated by bequests. The analysis shows that optimality of a positive tax on bequests rests on the strength of the effect of bequests on behavior of future generations, and suggests that inheritance rather than estate tax is better suited to implement the optimal policy.

Estate taxation is a policy topic of continued interest. Despite rumors of its demise in the United States where it was put on life support as the result of partial repeal in 2010, its future now seems more alive. However, the economic literature on taxation of estates is surprisingly inconclusive (see Kopczuk, 2013, for a recent survey). When generations are linked by altruism and the objective function respects dynastic preferences, taxation of estates is analogous to taxation of saving with identical baseline result of no taxation. In a recent paper, Farhi and Werning (2010) allow for the social planner to value welfare of children generation separately from the dynastic welfare and show that the corresponding externality due to insufficient giving should be addressed by policy that subsidizes bequests (albeit in a "progressive" manner). In a very stylized model, Kopczuk (2001) focuses on steady state policies in the presence of non-altruistic bequest motive and shows that the estate *tax* is a useful instrument. Piketty and Saez (2012) analyze linear taxation and many different extensions of a steady state setup and generally find a role for taxation of bequests.

The objective of this note is to clarify economic assumptions that determine the optimal tax treatment of bequests. I consider a joy-of-giving bequest motive and two generations: parents and children. The model captures two key considerations. First, within any particular family bequests have a positive externality because they benefit both parents and children. One can view this aspect as a manifestation of the source of the common argument against taxing estates: they reflect generosity not just self-interest.

At the same time, bequests generate inequality in the children's generation. While inequality induced by bequests has its ultimate source in the initial conditions (skill distribution of parents), the key point is that tax on bequests plays an independent redistributive role within the offspring generation. This is made stark by the joy-of-giving model that eliminates interactions between the two generations. In contrast, the standard altruistic model would assume that parents internalize incentives of children so that there would be no meaningful distinction between redistribution among dynasties, parents and children.

I show that the optimal bequest tax formula is simple and intuitive and it reflects these two forces: correction of an externality that pushes toward subsidies and relaxing of children's incentive constraints due to income effect that pushes toward taxation. The relative strength of these two effects determines the optimal sign and magnitude of the tax. I speculate that the optimal tax structure may in fact involve subsidies at the bottom and taxation at the top of the distribution. I further suggest that inheritance rather than estate tax may be a more suitable instrument here, because all determinants of the optimal policy reflect characteristics of a child.

The results also highlight the key empirical parameters of interest. It is the magnitude of the income effect due to bequests that that influences the optimal tax rate. In contrast, under the simple structure assumed in this paper, the direct effect of taxation on bequests does not enter the optimal tax formula.

1 Model

1.1 Individuals

Consider two generations: parents (P) and children (C). Parents are endowed with ability of w distributed according to some distribution function $H(w)$. The core of the analysis focuses on decisions of parents and does not require an assumption about correlation of abilities. I will proceed though through most of the discussion as if parents' and children's abilities are identical but will later comment on implications of a departure from this assumption.[1]

Consumption, bequests and labor income of generation i are denoted by C^i, Y^i and B^i, respectively. The corresponding labor supply is Y^i/w. Bequest represents net value of receipts by the donee. I will write tax functions of parents and children as $T^P(\cdot)$ and $T^C(\cdot)$ and comment on their arguments after introducing individual preferences and budget constraints.

I assume that children's preferences are given by

$$u^C(B^P + C^C, Y^C; w) = u\left(B^P + C^C, \frac{Y^C}{w}\right),$$

so that children receive a bequest from their parents but do not leave their own bequest. C^C is consumption net of bequests (and overall consumption is $B^P + C^C$); expressing consumption in this form will be notationally convenient in what follows. Children's budget constraint is

[1] The optimal tax schedule does depend on child's characteristic and hence the implementation of the optimal policy may require a tax on child's side when correlation is not perfect.

given by

$$B^P + C^C = B^P + Y^C - T^C(Y^C) \implies C^C = Y^C - T^C(Y^C)$$

Parents' preferences are given by

$$u^P(C^P, Y^P, B^P; w) = v\left(g(C^P, B^P), \frac{Y^P}{w}\right). \tag{1}$$

In particular, I assume here that utility function is weakly separable between income (or labor supply) and other goods: by Atkinson-Stiglitz theorem, this implies that bequest taxation would not be optimal if one considered parents' generation in isolation.

The budget constraint for parents is

$$C^P + B^P = Y^P - T^P(Y^P, B^P). \tag{2}$$

To simplify notation I assume the rate of return of zero throughout, but an extension is straightforward.

I am going to posit in what follows that both parental labor income and parental bequest are increasing with wage. The former requires standard agent-monotonicity condition, the latter follows from weak separability.

1.2 Tax schedules

I made specific assumptions about tax instruments. Tax liability of children was assumed to be $T^C(Y^C)$ and that of the parents is $T^P(B^P, Y^P)$. Putting bequest tax liability on the parents' side has subtle implications. It rules out an interaction of taxes on bequests and child's income, that may be useful in the presence of two-dimensional (bequests and wages) heterogeneity among children. It also eliminates the possibility that behavioral response of children may affect the actual net-of-tax transfer and hence warm-grow accruing to the parents. While such strategic interactions are in general very interesting, the objective here is to keep the model as simple as possible in order to make the key mechanism stark. I proceed by ruling out the possibility of integration of inheritance and income taxation of donees.

In practice, taxation that allows for interaction of inheritance and child's income is not common, but it is not inconceivable: inter vivos gifts are in some countries included in income tax base and the short-lived 1894 U.S. income-and-inheritance tax integrated the two (see Batchelder, 2009, for discussion).

The solution method assumes that parents take children income as given and children take bequests as given. In the presence of perfect correlation of ability this assumption is not restrictive. When there is imperfect correlation in wages, the optimal tax formula will in fact depend on children characteristics in a way that could not be implemented using a tax on parents alone. Hence, one should interpret the results as applying strictly to the perfect correlation case alone, but also as highlighting that a tax on children's side is likely to be necessary in general.

In what follows, I will exploit the structure that weak separability imposes on the response to marginal tax rates. In order to characterize the effect of changes in marginal tax rates, consider tax schedule $\tilde{T}^P(Y,B) = T(Y,B) + (\tau^Y - T^*_Y)(Y - Y^*) + (\tau^B - T^*_B)(B - B^*)$ for some (B^*, Y^*) where $T^*_X = \frac{\partial T(Y^*,B^*)}{\partial X}$, $X \in \{B, Y\}$. Weakly separable preferences in (1) imply that given Y^P an individual needs to maximize $g(C^P, B^P)$ subject to the budget constraint 2 (with $\tilde{T}$ in place of T). Hence, we can write $B^P(\tau^B, \tau^Y, Y^P(\tau^B, \tau^Y))$.

Lemma 1 *Denote* $\Gamma \equiv \frac{\partial Y^P}{\partial \tau^B} \Big/ \frac{\partial Y^P}{\partial \tau^Y}$. *Given weakly separable preferences (1), the effect of a change in* τ^B *on the size of bequest evaluated at* (B^*, Y^*) *can be expressed as*

$$\frac{dB^P}{d\tau^B} = \frac{\partial B^P}{\partial \tau^B} + \frac{dB^P}{d\tau^Y} \cdot \Gamma$$

and the effect on tax liability of parents is

$$\frac{d\tilde{T}^P}{d\tau^B} = \tau^B \frac{\partial B^P}{\partial \tau^B} + \frac{d\tilde{T}^P}{d\tau^Y} \cdot \Gamma$$

PROOF:

Total effect of τ^B on B^P is $\frac{dB^P}{d\tau^B} = \frac{\partial B^P}{\partial \tau^B} + \frac{\partial B^P}{\partial Y^P}\frac{\partial Y^P}{\partial \tau^B}$. Note that $\frac{\partial \tilde{T}^P}{\partial \tau^Y} = 0$ when evaluated at $Y = Y^*$, so that $\frac{\partial B^P}{\partial \tau^Y} = 0$ and $\frac{dB^P}{d\tau^Y} = \frac{\partial B^P}{\partial Y^P}\frac{\partial Y^P}{\partial \tau^Y}$. Combining the two yields the first part. Analogously, the overall impact on revenue of changes in τ^B and τ^Y is $\tau^B \frac{\partial B^P}{\partial \tau^B} + \frac{d\tilde{T}^P}{dY^P}\frac{\partial Y^P}{\partial \tau^B}$ and $\frac{d\tilde{T}^P}{dY^P}\frac{\partial Y^P}{\partial \tau^Y}$, respectively, yielding the second part. ■

This result is simply saying that under weak separability the effect of a modification in marginal bequest tax rate may be decomposed into own price response holding labor income constant and the effect of a change in the equivalent marginal labor income tax rate. Furthermore, given a change in the marginal bequest tax rate $\Delta\tau^B$, the corresponding change in labor income tax is given by $\Gamma \cdot \Delta\tau^B$.

1.3 Government

I assume that government intends to maximize welfare given by

$$\int u^P + \beta u^C \, dH(w)$$

with β representing social planner's discounting of utility of future generations. Note that the utility from giving is part of parents' utility and hence is counted as part of the overall welfare.

I make the standard assumption in the optimal taxation literature that w is not observable but that other variables $(C^P, Y^P, B^P, C^C, Y^C)$ are. As discussed before, the overall tax liability from a given dynasty is assumed to be $T(Y^P, B^P, Y^C) = T^P(Y^P, B^P) + T^C(Y^C)$. The objective of the policy is to maximize welfare subject to the revenue constraint $Q = \int T(Y^P, B^P, Y^C) \, dH(w)$ (where Q is the revenue requirement), and while respecting individual optimization.

1.4 Characterizing the optimum

I will provide a heuristic characterization of the solution. The obvious background result here is the Atkinson-Stiglitz theorem. From the parent generation's perspective, bequests are a good like any other, so that maximization of welfare of that generation in isolation would involve no tax on bequests when preferences are weakly separable between labor and other goods.

There are two departures from this way of thinking here. First, bequests benefit children and therefore yield a positive externality. Second, bequests may change behavior of children and hence affect welfare through *fiscal* externality.

Consider some initial tax schedule for the parents, $T^P(Y, B)$, pick an individual w^* with the corresponding optimal allocation (Y^*, B^*) and denote $\tau^B = \frac{\partial T^P(Y,B)}{\partial B}$ and $\tau^Y = \frac{\partial T^P(Y,B)}{\partial Y}$.

To derive the optimal tax formula, I consider a perturbation to the optimal tax schedule for bequests. In particular, note that the argument does not require that the labor income tax for parents and/or children is optimal (though they obviously could be). Although the implementation is somewhat different, the whole approach is conceptually similar to arguments of Saez (2002), Laroque (2005) and Kaplow (2006) who analyzed the Atkinson-Stiglitz result.

Let the set of individuals with bequests in $(B^*, B^*+\eta)$ be given as $(w^*, w^*+\Delta w)$, and the corresponding range of incomes be $(Y^*, Y^*+\xi)$. I will introduce two offsetting perturbations to bequest and labor taxation.

Consider a small positive change $\Delta\tau$ in the marginal bequest tax rate and tie the change in τ^Y to it as $\Delta\tau^Y = \frac{\eta}{\xi}\Delta\tau^B$ to yield the perturbed tax schedule as follows:

$$\begin{aligned}\tilde{T}^P(Y,B) = T(Y,B) + \Delta\tau^B \cdot (B-B^*) \cdot I\{B \in (B^*, B^*+\eta)\} + \Delta\tau^B \cdot \eta \cdot I\{B \geq B^*+\eta\} \\ -\Delta\tau^Y \cdot (Y-Y^*) \cdot I\{Y \in (Y^*, Y^*+\xi)\} - \Delta\tau^Y \cdot \xi \cdot I\{Y \geq Y^*+\xi\}\end{aligned}$$

The schedule is modified for individuals with wages in $(w^*, w^*+\Delta w)$ in the corresponding ranges of B and Y. Within these small ranges (of size η and ξ respectively), the marginal tax rate on bequests increases and the marginal tax rate on labor income declines. Note that the perturbation implies that there is no change in statutory or actual (because perturbation is inframarginal) tax liability at $(B^*+\eta, Y^*+\xi)$ and for any individual with $w \notin (w^*, w^*+\Delta w)$.

One can also show that for small $\Delta\tau^B$, $\frac{\Delta\tau^Y}{\Delta\tau^B} = \frac{\eta}{\xi} \approx \frac{\partial Y^P}{\partial\tau^B}\Big/\frac{\partial Y^P}{\partial\tau^Y} = \Gamma$,[2] as defined in Lemma 1. Hence, decomposition in that Lemma turns out to be extremely useful for analyzing the impact of the perturbation: for those affected, the effect of the simultaneous bequest-labor perturbation on bequests is simply $\left(\frac{dB^P}{d\tau^B} - \frac{dB^P}{d\tau^Y}\cdot\Gamma\right)\Delta\tau^B = \frac{\partial B^P}{\partial\tau^B}\Delta\tau^B$ and the effect on parental revenue is $\left(\frac{dT^P}{d\tau^B} - \frac{dT^P}{d\tau^Y}\cdot\Gamma\right)\Delta\tau^B = \tau^B\frac{\partial B^P}{\partial\tau^B}\Delta\tau^B$.

We are now in a position to evaluate the overall impact of this perturbation on welfare.

[2] Adapting proof of Lemma 1 in Saez (2002), for a given person w^* define $\Delta\tilde{\tau}^Y(Y-Y^*)$ to be a perturbation of a labor income tax schedule starting at (Y^*, B^*) that yields exactly the same level of utility for any Y as does the perturbation in bequest tax rate by $\Delta\tau^B$ starting at B^*. By construction, the same value of Y is optimal for both perturbations so that we have to have $\frac{\partial Y^P}{\partial\tau^Y}\Delta\tilde{\tau}^Y(Y-Y^*) = \frac{\partial Y^P}{\partial\tau^Y}\Delta\tau^B$, and thus $\frac{\Delta\tilde{\tau}^Y}{\Delta\tau^B} = \frac{\partial Y^P}{\partial\tau^Y}\Big/\frac{\partial Y^P}{\partial\tau^Y}$. Because both of these changes have to have exactly the same effect on maximized utility, we need to have for small changes $\frac{dU^P}{d\tau^B}\Delta\tau^B = \frac{dU^P}{d\tau^Y}\Delta\tilde{\tau}^Y$ and an application of the envelope to both sides implies $-u_C(B-B^*)\Delta\tau^B = -u_C(Y-Y^*)\Delta\tilde{\tau}^Y(Y-Y^*)$ so that $\frac{\Delta\tilde{\tau}^Y}{\Delta\tau^B} = \frac{Y-Y^*}{B-B^*}$. Putting it together, it implies that $\frac{\xi}{\eta} = \frac{Y-Y^*}{B-B^*} = \frac{\partial Y^P}{\partial\tau^Y}\Big/\frac{\partial Y^P}{\partial\tau^Y}$.

It can be decomposed into three effects: direct impact on welfare, direct impact on revenue and a change in revenue due to behavioral response.

For individuals outside the interval $(w^*, w^* + \Delta w)$, both perturbations have identical and exactly offsetting lump-sum implications so that neither revenue nor welfare is affected.

For individuals within $(w^*, w^* + \Delta w)$, the offsetting changes in marginal tax rates on bequest and labor income imply canceling effects on welfare of parents. However, the size of bequest is affected due to substitution response, so that the net effect on children's welfare is $\beta \cdot \frac{\partial u^C}{\partial C} \cdot \frac{\partial B^P}{\partial \tau^B}$.

By Lemma 1 revenue from parents changes by $\tau^B \frac{\partial B^P}{\partial \tau^B}$.

Finally, bequests have also an effect on revenue from children: this effect is given by $T^{C\prime}(Y^C) \cdot \frac{\partial Y^C}{\partial B^P} \cdot \frac{\partial B^P}{\partial \tau^B}$, i.e. it reflects the response of parental bequest, its impact on child's effort and the revenue implications.

1.5 Result and interpretation

Recalling that at the optimum a perturbation of the tax schedule should have no welfare impact, denoting the multiplier on the revenue constraint by ρ and putting it all together implies

$$\beta \cdot \frac{\partial u^C}{\partial C} \cdot \frac{\partial B^P}{\partial \tau^B} \Delta\tau + \rho \cdot \left(\tau^B \cdot \frac{\partial B^P}{\partial \tau^B} + T^{C\prime}(Y^C) \frac{\partial Y^C}{\partial B^P} \frac{\partial B^P}{\partial \tau^B} \right) \Delta\tau = 0$$

Simplifying yields the main result:

Theorem 1 *Suppose that $\frac{\partial B^P}{\partial \tau^B}$ is nonzero and finite. The optimal marginal tax rate on bequests is given by*

$$\tau^B = -\beta \cdot \frac{\partial u^C}{\partial C} \cdot \rho^{-1} - T^{C\prime}(Y^C) \cdot \frac{\partial Y^C}{\partial B^P}.$$

The first term on the right-hand side is the correction of an externality from giving and is the sole effect present and studied in Farhi and Werning (2010). It is negative, reflecting that a gift to children is double-blessed, because it provides both (internalized) utility to the parent and (non-internalized) utility to the child. If one additionally assumed additive separability of the utility, then $\frac{\partial u^C}{\partial C}$ would be just a function of $B^P + C^P$ and hence would be unambiguously declining. This term is also different than the naïve first-best Pigouvian prescription which would call for a subsidy of $\frac{u'(B^P(w)+C^C(w))}{u'(C^P)}$. This is because correcting the externality is a project that is costly in terms of government's funds and that cost is uniformly equal to ρ for all individuals, so that correcting externality at high consumption levels is not as worthwhile (this is precisely the mechanism that implies declining marginal subsidies in Farhi and Werning, 2010).

The second term is new. Expecting, as is natural, that the marginal income tax rate for children is positive $T^{C\prime}(Y) > 0$ and that income is a normal good so that $\frac{\partial Y^C}{\partial B^P} \leq 0$, the contribution of the second term is unambiguously positive. This is intuitive. Bequests have an income effect which makes lower-effort alternatives more attractive. This effect is costly from the policy maker's point of view because lower effort reduces revenue. Hence, the optimal policy should counteract by taxing bequests.

It is the interaction of these two effects that determines the overall rate. What might one expect regarding their size? Recall that the result does not require that the children's tax schedule be optimal. Consider then a constant marginal tax rate $T^{C\prime}(Y^C) > 0$ and suppose that $\frac{\partial Y^C}{\partial B^P} = \text{constant} < 0$. In such a case, because under natural assumptions marginal utility of income declines to zero as skill level increases, for high enough skill type the second effect will dominate and the optimal tax rate will become positive. At the same time, it is of course possible to expect that the tax rate may be negative. Trivially, it will be the case when there is no tax on the children side. It may also be the case for low-skilled dynasties with corresponding strong externality effect, and when the incentive effect is weak. In general, one could see subsidies in some parts of the distribution and taxation in others. There is no reason to believe that these qualitative speculations would not apply in the fully optimal tax scheme. In particular, since for high-skilled individuals the first term vanishes, then whenever the optimal marginal income tax rate at the top is positive and income effect does not disappear, the bequest tax would have to be positive as well.

1.6 Comments

There are a number of interesting observations in the context of this result.

Somewhat surprisingly, the effect of taxation on the size of bequest does not enter the formula. This is because all costs and benefits — the revenue loss due to response by parents, the revenue loss due to disincentives for children and welfare gain due to higher bequests —

are proportional to the magnitude of parental response.

The proposition requires though that $\frac{\partial B^P}{\partial \tau^B} \neq 0$ (and finite). When it is not the case, the whole formula need not apply. Inelastic bequests with the joy-of-giving model are a knife-edge case, but there are of course alternative bequest motives, such as wealth-in-utility or accidental bequests that straightforwardly generate inelastic bequests. In the wealth-in-utility case, the optimal policy would call for confiscating bequests while the accidental bequest case requires addressing the underlying market failure (Kopczuk, 2003).

The crucial assumption that plays a role here is that parental bequests interact with incentive constraints of the child. While the analysis here was based on variation to the optimal policy and did not highlight incentive constraints explicitly, the mechanism is clear: transfers weaken work incentives and hence make the incentive constraints tighter. It is important to note that while the presence of this effect has a strong intuitive appeal, it required deviating from the assumption of perfect altruism. It is ultimately an empirical question of how important it is.

All components of the optimal tax formula depend on information about a child. This suggests that a tax on the donee side — i.e., a tax on inheritances — may be preferred to a tax on estates. An additively separable tax on the donee side is equivalent to a tax on the parent side and hence covered by this analysis. More general tax on the donee side would be necessary to allow for additional flexibility when wages of parents and children are imperfectly correlated. Since the optimal bequest tax schedule in Theorem 1 depends on both the size of a bequest and characteristics of the donee, a tax that does not incorporate information about the donee will not be able to implement it unless observing donor provides the same information. Explicitly considering such an extension is left for future work.

2 Conclusions

The analysis in this paper demonstrated that when incentives of children are not fully internalized by parents, there is a role for discouraging bequests through taxation. The argument was made in the context of a joy-of-giving bequest motive but the key force is likely to be much more general: when transfers have income effect on donee behavior, they make incentive constraints tighter or, equivalently, have fiscal externality.

The key element of the optimal tax formula is the effect of bequests on behavior of donee. Its magnitude is an empirical question. Limited work on this topic has found some evidence of adverse labor supply responsiveness using variation in inheritances and other sources of wealth shocks (see Kopczuk, 2013, for references). Some other channels through which inheritance affects donees such as liquidity, entrepreneurship and firm-performance effects have also been analyzed and could be explicitly incorporated in this framework.

Finally, the paper considers only a very particular bequest motive. The leading alternative — the altruistic motive — is not able to explain wealth accumulation at the top of the distribution (and has mixed support elsewhere), and the analysis here shows that departing from it changes significantly policy implications. As Kopczuk (2013) extensively discusses, the evidence on bequest motives suggests that they are heterogeneous across individuals and are not mutually exclusive for a given individual. Sorting out empirical explanations and understanding their optimal policy implications remains an important research agenda.

References

Batchelder, Lily L. 2009. "What Should Society Expect from Heirs? A Proposal for a Comprexensive Inheritance Tax." *Tax Law Review*, 63(1): 1–111.

Farhi, Emmanuel, and Iván Werning. 2010. "Progressive Estate Taxation." *Quarterly Journal of Economics*, 125(2): 635–73.

Kaplow, Louis. 2006. "On the Undesirability of Commodity Taxation Even When Income Taxation is Not Optimal." *Journal of Public Economics*, 90(6-7): 1235–50.

Kopczuk, Wojciech. 2001. "Optimal Estate Taxation in the Steady State." University of Michigan, mimeo.

Kopczuk, Wojciech. 2003. "The Trick is to Live: Is the Estate Tax Social Security for the Rich?" *Journal of Political Economy*, 111(6): 1318–1341.

Kopczuk, Wojciech. 2013. "Taxation of Intergenerational Transfers and Wealth." In *Handbook of Public Economics*. Vol. 5, , ed. Alan J. Auerbach, Raj Chetty and Emmanuel Saez. forthcoming.

Laroque, Guy. 2005. "Indirect Taxation is Superfluous under Separability and Taste Homogeneity: A Simple Proof." *Economics Letters*, 87(1): 141–44.

Piketty, Thomas, and Emmanuel Saez. 2012. "A Theory of Optimal Inheritance Taxation." Paris School of Economics and UC Berkeley, mimeo.

Saez, Emmanuel. 2002. "The Desirability of Commodity Taxation under Non-Linear Income Taxation and Heterogeneous Tastes." *Journal of Public Economics*, 83(2): 217–320.