

INEQUALITY, TAXATION  
AND INTERGENERATIONAL  
TRANSMISSION

# RESEARCH ON ECONOMIC INEQUALITY

Series Editors: John A. Bishop and Juan Gabriel  
Rodríguez

RESEARCH ON ECONOMIC INEQUALITY VOLUME 26

# INEQUALITY, TAXATION AND INTERGENERATIONAL TRANSMISSION

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# INTRODUCTION

*Research on Economic Inequality, Volume 26, Inequality, Taxation, and Intergenerational Transmission*, primarily comprises papers presented at the 8th Economic Inequality Society meeting in New York City (July 2017). The volume contains 11 papers on a wide range of topics of interest to inequality, poverty, and taxation researchers.

Chapters 1 and 2 address issues of taxation and inequality. Frank Cowell, Dirk Van de gaer, and Chang He address the important topic of inheritance taxation. Abolitionists of estate taxation often point to the small amount of revenue collected and thus argue that inheritance taxes have but modest effects on the distribution of wealth. Cowell and his co-authors argue that it is the long-run effect on the “pre-distribution” that matters most. In the presence of inheritance taxes, work, leisure, and saving rates all change in ways that reduce wealth inequality. Their simulation results imply that a modest wealth tax can “indeed be a powerful engine of long run change” in the wealth distribution.

Claudio Zoli investigates the relationship between inequality and progressive taxation under a general definition of inequality equivalence. He proposes a two-parameter generalization of inequality equivalence that includes as special cases the path-independent and unit-consistent criterion, and the intermediate concept of inequality. For the former concept, a non-decreasing average tax rate is a necessary and sufficient condition to guarantee that taxes reduce inequality for all the inequality views in between the absolute and the relative.

*Capital in the Twenty-First Century* by Piketty (2014) has generated a large debate on the prospects of the evolution of wealth inequality, being the effect of economic growth ( $g$ ) on wealth, one of the main controversies. Thus, it has been claimed that a decrease in  $g$  increases the difference with respect to the rate of return on capital ( $r$ ),  $r - g$ , which in turn increases wealth inequality. In Chapter 3, Mauro Patrão presents a neoclassical growth model with heterogeneous agents that generalizes and improves the models in Piketty and Zucman (2015) and Aoki and Nirei (2016). He shows that under this more general framework, the above prediction is more ambiguous.

In the Chapter 4, Elena Barcena-Martin and Jacques Silber apply their newly developed decomposition method of the Foster-Wolfson bipolarization index to the determinants of wage bipolarization. The authors remind us that the difference between inequality and bipolarization is that a decrease in within-group homogeneity lowers inequality but raises bipolarization.

Using the European SILC data and highlighting Portugal, they find that educational differences, gender and working in the public sector are important determinants of bipolarization. For comparison, the authors also examine the main sources of wage inequality.

Chapter 5 (Miri Endeweld and Jacques Silber) is entitled, “The Counting Approach to Multidimensional Food Security Measurement: The Case of Israel.” In this chapter, the authors apply the tools of multidimensional poverty measurement, along with alternative counting methods, to allow a more in-depth examination of food insecurity. For example, the authors are able to distinguish between real and nominal food insecurity as well as between basic and non-basic food insecurity. Various subpopulations are examined to determine the relative levels of food insecurity.

Claudia Samano-Robles, in her chapter, entitled, “The Impact of Education on Income Inequality in Latin America Between 2000 and 2010” address the question of the “paradox of (educational) progress.” This “paradox” postulates that the expansion of educational opportunities tends to increase inequality. Her study of 18 Latin American countries confirms this notion if we examine years of schooling alone. However, if we also recognize changes in the rate of return to schooling she finds that greater schooling reduces inequality in six countries and increases inequality in four countries. In countries where inequality fell, it was due to declining returns to education at the top of the distribution.

Chapters 6–8 focus on the transmission between generations. Ana Suárez and Ana Jesús López assess the changes over time in inequality of opportunity for 26 European countries. Using the wide variety of personal harmonized circumstances in the EU-SILC database, the authors measure the significance of changes in inequality of opportunity by estimating the confidence intervals (instead of the standard errors) without imposing any functional form to the data.

In “Macroeconomic Determinants of Cross-Country Differences in Intergenerational Transmission of Economic Disadvantage,” Maria A. Davia and Nuria Legazpe identify the differential risk of living in poverty for adults raised in poor households. In particular, the authors test how macroeconomic and institutional features shape the intergenerational transmission of economic disadvantage (ITED). Using the EU-SILC 2011 module on *ITED*, they find that past income inequality is positively correlated with current ITED intensity and that social protection for families with children and unemployment benefits are negatively correlated with later ITED levels. In addition, educational expansion is found to be correlated with lower ITED,

which shows that public investments in education could be a proper way to reduce inequality of opportunity.

In Chapter 9 on intergenerational transmission, “Long-Run Factors Influencing Intergenerational Perceived Job Status Mobility,” John A. Bishop, Haiyong Liu, and Juan Gabriel Rodríguez examine whether higher income inequality hurts economic performance by decreasing future intergenerational mobility. They find a robust negative (positive) association of lagged income inequality with upward (downward) intergenerational job status mobility. Moreover, the quality of political institutions and religious fractionalization are found to contribute positively to job status mobility. On the contrary, higher levels of past GDP result in less upward job status mobility.

The final two chapters are concerned with the inequality perceptions and preferences. In Chapter 10, Aboozar Hadavand addresses the question of why the perception of inequality and objective inequality often differ. He writes that most observers credit this discrepancy to a misperception of the respondents – he suggests that it may also be an issue of mismeasurement. Hadavand introduces a measure of “closeness between distributions” and finds that in most countries a significant share of respondents chose the closest distribution to the actual distribution in their society. Factors such as education level and income are found to affect the correctness of the respondents.

Chapter 11 by Bishop and Liu examine the role of governance in the expression of equality preferences. Their claim is that in a “well-functioning” democracy redistributive preferences should be clustered around acceptance of the current level of inequality. Using data from the World Values survey and a series of political indicator variables they find that individuals in democracies are more “content” with the current level of inequality.

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# CHAPTER 1

## INHERITANCE TAXATION: REDISTRIBUTION AND PREDISTRIBUTION

Frank A. Cowell, Dirk Van de gaer and Chang He

### ABSTRACT

*It is well known that taxes on the transfer of wealth typically raise very little revenue. However, this does not mean that they are ineffective as tools for redistribution. In this chapter, we show how important such taxes can be in the long-run distribution of wealth, reducing equilibrium inequality (the “predistribution” effect) by a much larger amount than what is apparent in terms of the immediate impact of the tax (the “redistribution” effect).*

**Keywords:** Wealth distribution; inheritance; inheritance taxation; redistribution; predistribution; long-run inequality.

**JEL classification:** D31; D63

### 1. INTRODUCTION

Taxes on the transmission of wealth have had a mixed fortune as tools for economic policy makers. In some countries they were once seen as an engine of transformative social reform during the twentieth century. But in recent times, the objectives and purpose of this form of taxation seemed to be less clear to policy-makers and the general public. It could be argued that there has even emerged a new consensus that these fiscal instruments – estate taxes, inheritance taxes, bequest taxes, gift taxes, and capital transfer taxes – are useless or even dangerous as agents of redistribution. Some countries, such as Australia and Sweden,

have gone as far as abolishing the tax (Henrekson & Waldenström, 2016; Pedrick, 1981); others have seriously contemplated doing so.

In this chapter we analyze this issue using a simple model of intergenerational wealth transmission that allows for heterogeneity in family composition. In the context of this model we show how the equilibrium distribution of wealth is related to the effective savings rate from one generation to the next and the parameters characterizing the family heterogeneity. We show that in addition to the immediate redistributive impact of the tax and the transfers that the tax makes possible, the tax induces a change in wealth dynamics and the equilibrium wealth distribution – the phenomenon known idiomatically as “predistribution.”

The chapter is organized as follows. Section 2 briefly reviews the importance and nature of bequest and inheritance taxes in practice. Sections 3 and 4 set out the model and explain the way it works in determining the wealth distribution. Section 5 explains formally the distinction between “redistribution” and “predistribution” and Section 6 illustrates the importance of this distinction in a simulation. Section 7 concludes.

## 2. INHERITANCE AND BEQUEST TAXATION

What is the economic motivation for a tax on wealth transfers? Let us briefly consider this in terms of three simple criteria of taxation.

*Revenue raising.* From the point of view of the practical policy-maker this is, perhaps, the most important criterion of the three. It is clear that taxation of wealth transfers is never going to be a substantial revenue raiser. This is evident from Table 1 which shows the percentage of total tax revenue raised by inheritance, gift, and bequest taxes in four OECD countries over a half century: the maximum, just over two-and-a-half percent of total revenue, was achieved by the UK in the mid-1960s. Compare this with Table 2 that tells the companion story for income taxation: it is clear that, in the UK and the US in recent years, the personal income taxation raises 50–100 times more revenue than taxes on the transfer of wealth. It is, perhaps, unsurprising that some fiscally pragmatic countries seem to have decided that this form of taxation was simply not worth the trouble of collecting.

*Efficiency.* It is difficult to say anything about the efficiency aspects of inheritance and bequest taxation without a clear understanding of the motives for making bequests as Cremer and Pestieau (2006, Chapter 16) clearly explain:

If bequests are accidental, estate taxation is quite efficient. However, if people are motivated to work and to save by the idea of leaving their families an inheritance, the tax will be distortionary. (p. 1109)

The empirical evidence on what drives bequest behavior is mixed. In this chapter, we make no claim for or against the efficiency impact of this form of taxation relative to other forms of taxation where the nature of individual decisions and their impact on efficiency is better understood. However, in Section 3, we do develop a simple and fairly standard model of bequest behavior that is used to characterize the redistribution and predistribution processes.

*Equity.* The temptation is to say that, given that bequest or inheritance taxation raises so very little revenue (Table 1) there cannot be much resource to redistribute and, therefore, this form of taxation can have only a small impact on inequality. This reasoning on bequest taxation, popular among abolitionists, is mistaken. It focuses only on a simple “one-shot” impact assessment of the tax – what could be raised and redistributed in a single time period. However, the presence of the tax will affect the dynamics of intergenerational transfers and the equilibrium distribution of wealth. This is the essence of the “predistribution” argument concerning bequest taxation: a small tax on wealth transfers that yields only a very modest revenue in any year can nevertheless exert a powerful leverage on the long-run distribution of wealth, as we will show.

3. MODEL

Consider an individual who comes from a family of  $k$  kids. He or she has wealth  $W_t$  at time  $t$  where time is discrete and each unit of time corresponds to one generation. We need a simple story of where the wealth comes from and where it goes. In the absence of government involvement in the redistribution of wealth, wealth comes from lifetime earnings,  $E_t$ , and inheritance,  $I_t$ . Some of this is dissipated in the form of consumption over the lifetime and some passed on as a bequest to the next generation. If the government is involved, there are two new features: (1) taxation of wealth or of wealth transfers and (2) the use of the revenue raised by the tax.

We will assume that there is a tax on bequests which, in its simplest form, is equivalent to the same tax on inheritance. The tax could be made progressive by letting the marginal rate increase with the size of the bequest. Alternatively, we could

Table 1. Estate, Inheritance, and Gift Taxes as Percent of Total Tax Revenue.

	1965	1980	1990	2000	2007	2009	2011	2012	2013	2014
Canada	1.46	0.07	0.00	0.00	0.00	0.04	0.04	0.03	0.04	0.04
Sweden	0.39	0.21	0.19	0.22	0.00	0.00	0.00	0.00	0.00	0.00
UK	2.62	0.59	0.65	0.62	0.77	0.50	0.54	0.57	0.60	0.66
USA	2.06	1.15	1.01	1.23	0.81	0.75	0.39	0.49	0.61	0.53

Source: OECD (2016).

Table 2. Individual Income Taxes as Percent of Total Tax Revenue.

	1965	1980	1990	2000	2007	2009	2011	2012	2013	2014
Canada	22.61	34.10	40.84	36.81	37.07	36.22	36.06	36.42	36.21	36.34
Sweden	48.75	41.04	38.51	33.24	30.87	28.79	27.53	28.03	28.38	28.60
UK	33.06	29.41	29.40	29.34	29.94	30.41	28.07	27.47	27.68	27.43
USA	31.67	39.08	37.67	42.22	38.30	34.32	38.79	38.50	38.74	39.30

Source: OECD (2016).

assume that the tax is used to fund a “demogrant”  $D_t$ , a form of public wealth transfer. Therefore, with the government involvement, individual (gross) wealth comes from three sources: the demogrant, lifetime earnings, and inheritance:

$$W_t = D_t + E_t + I_t. \quad (1)$$

Hence, individual wealth consists of the person’s own production (earnings  $E_t$ ) plus two forms of transfer, one private ( $I_t$ ) and one public ( $D_t$ ). The determination of the government-provided demogrant can be considered after we have examined individual behavior. We first consider each of the two non-government components of wealth in (1).

### 3.1. Individual Behavior

We characterize an individual’s behavior according to certain simple rules. However, these rules are consistent with conventional maximization behavior as shown in [Cowell and Van de gaer \(2017\)](#).

*Earnings.* We assume that people are free to choose  $E_t$  given their wealth and the prevailing wage rate; in other words, they choose whether or not to work and the proportion of their lifetime that is devoted to work. We further assume that earnings decrease with wealth (leisure is a normal good) in the following way:

$$E_t = \bar{E} - vW_t, \quad (2)$$

if  $W_t < \bar{E}/v$  and zero otherwise, where  $\bar{E}$  represents the maximum earnings that a person could choose to make over the lifetime and  $v$  is a positive parameter capturing the taste for leisure.

*Inheritance.* In the absence of taxation, if the parents have equal wealth and make equal bequests, and if  $k$  children share equally in the inheritance, the relationship between inheritance and parental bequest would be

$$I_t = \frac{2}{k} B_{t-1}, \quad (3)$$

where  $B_{t-1}$  is the amount left by each parent in the previous generation  $t - 1$ . Clearly, (3) immediately raises the question of the determination of the size of the bequest.

*Bequests.* We will assume that the bequest made by each of the two parents is proportional to his/her wealth

$$B_t = \beta W_t, \quad (4)$$

where  $\beta$  is a positive parameter consisting of the savings rate on wealth multiplied by the one-generation growth factor of wealth.

### 3.2. Government Intervention

There are three aspects of government activity that need to be considered:

*Taxation.* We assume that there is a tax at a uniform proportional rate  $\tau$  on all bequests. Allowing for this, (3) is modified to become

$$I_t = \frac{2[1-\tau]}{k} B_{t-1}. \quad (5)$$

Clearly, for a proportional bequest tax, we would have the same outcome if the tax had been levied at the same rate on inheritance.

*Demogrant.* There is a variety of sensible assumptions that could be made about the way the transfer  $D_t$  is paid: for example, it could be conditioned on the current generation's circumstances and tapered above a specific wealth level, in which case we have  $D_t = D(W_t)$ . For the most part of our discussion, we assume that there is universal eligibility for the demogrant and that this wealth transfer is paid equally to all.

*Budget constraint.* We could assume a zero demogrant and still have something to say about the equalizing role of taxation (see Section 4.3) – in such a case, the proceeds of the tax are effectively discarded, or spent in ways that lie outside the model. However, it is more natural to assume that the demogrant is funded by the bequest (inheritance) tax subject to a government budget constraint.

The assumptions made about the form of the tax and the demogrant make the government's budget constraint easy to write down. From (4) and the assumption of a proportional tax, the amount raised by the government from a person with wealth  $W_{t-1}$  is  $\tau\beta W_{t-1}$ . Then, given the assumption of a uniform demogrant, the budget constraint is just  $D_t \leq \tau\beta \bar{W}_{t-1}$  where  $\bar{W}_{t-1}$  is the mean wealth of the parental generation (the population alive at time  $t-1$ ). Assuming that the government will want to provide the maximum demogrant possible for a given  $\tau$ , the budget constraint at time  $t$  is binding and may be written out in full as

$$\int D(W_t) dF_t(W) = \tau\beta \int W dF_{t-1}(W), \quad (6)$$

where  $F_t$  is the distribution of wealth at time  $t$  (in generation  $t$ ). In the special case of a uniform demogrant we have

$$D_t = \tau\beta \bar{W}_{t-1} = \tau\beta \int W dF_{t-1}(W). \quad (7)$$

## 4. THE ECONOMY AND EQUILIBRIUM

Here we focus on tax policy in equilibrium. But we can consider equilibrium either in the short run or the long run.

#### 4.1. Short Run

In order to make the short-run equilibrium in period  $t$  precise in the no-tax case we need only to specify the joint distribution of period- $(t - 1)$  bequests and family size: these determine the distribution of wealth that is present in generation  $t$ . Given the bequests made by the  $t - 1$  generation, the inheritance for each person is exogenously given. We may think of the short-run equilibrium as one conditional on the period- $(t - 1)$  bequests.

Therefore, imagine a person at time  $t$  who comes from a family where there were  $k$  kids and where each parent had left an amount  $B_{t-1}$ . Using (1)–(3) with  $D_t = 0$ , we find the person's overall wealth is given by

$$W_t = \begin{cases} \frac{1}{1+v} \left[ \bar{E} + \frac{2}{k} B_{t-1} \right] & \text{if } B_{t-1} < \frac{k}{2} \bar{B}, \\ \frac{2}{k} B_{t-1} & \text{otherwise,} \end{cases} \quad (8)$$

where

$$\bar{B} := \frac{\bar{E}}{v} \quad (9)$$

is a threshold bequest level.

Now suppose that a redistribution scheme  $(\tau, D_t)$  is introduced. Once again, the pre-tax inheritance for each person is exogenously given. Given the assumption of a uniform demogrant, then using (1), (2), and (5), individual wealth is now determined by

$$W'_t = \begin{cases} \frac{1}{1+v} \left[ \tau \beta \bar{W}_{t-1} + \bar{E} + \frac{2[1-\tau]}{k} B_{t-1} \right], & \text{if } B_{t-1} < \frac{k}{2} \bar{\bar{B}}, \\ \tau \beta \bar{W}_{t-1} + \frac{2[1-\tau]}{k} B_{t-1} & \text{otherwise,} \end{cases} \quad (10)$$

where

$$\bar{\bar{B}} := \frac{\bar{E}}{[1-\tau]v} - \frac{\tau \beta \bar{W}_{t-1}}{1-\tau} \quad (11)$$

is another threshold bequest level and  $\bar{W}_{t-1}$  is mean wealth evaluated on (1) in the previous generation  $t-1$ . Notice that this incorporates a short-run response from the individuals at time  $t$ : the introduction of the demogrant and the taxing away of part of the bequest before the inheritance is received produce a change in life-time earnings in the current generation according to (2) and this is built into (10). We see from (9) and (11) that  $\bar{\bar{B}} > \bar{B}$  if

$$\overline{W}_{t-1} < \frac{\overline{E}}{\beta v}, \quad (12)$$

a condition that is empirically reasonable.

Consider the short-run change in personal wealth brought about by the introduction of the scheme  $(\tau, D_t)$ . If the condition in the first line of (8) is satisfied, then so too is the condition in the first line of (10). In this case, a person characterized as  $(k, B_{t-1})$  experiences a change in wealth given by

$$\Delta W := \frac{\tau}{1+v} \left[ \beta \overline{W}_{t-1} - \frac{2}{k} B_{t-1} \right]. \quad (13)$$

However, there are other possibilities for  $(k, B_{t-1})$ , corresponding to two other combinations of the conditions in (8) and (10). Using (13) and summarizing all three possibilities, we find that the change in individual wealth brought about by the scheme is given by

$$W'_t - W_t = \begin{cases} \Delta W & \text{if } B_{t-1} < \frac{k}{2} \overline{B}, \\ \Delta W + \frac{\overline{E} - \frac{2v}{k} B_{t-1}}{1+v} & \text{if } \frac{k}{2} \overline{B} \leq B_{t-1} < \frac{k}{2} \overline{\overline{B}}, \\ [1+v] \Delta W & \text{if } B_{t-1} \geq \frac{k}{2} \overline{\overline{B}}. \end{cases} \quad (14)$$

The short-run equilibrium impact of the redistribution scheme represented by the tax and demogrant is given by the distribution over the population of the amounts  $W'_t - W_t$  in (14). Here “equilibrium” means simply that the government budget constraint is exactly satisfied given the scheme’s parameters  $(\tau, D_t)$  and the previous generation’s mean wealth  $\overline{W}_{t-1}$ . From (14) we may infer the break-even bequest level for someone who came from a family with  $k$  kids. If it were the case that  $B_{t-1} < \frac{k}{2} \overline{B}$  then this break-even level would be at  $\frac{1}{2} k B^*$ , where  $B^* := \beta \overline{W}_{t-1}$ ;

if the person’s parents had each made a bequest higher than that, his wealth would be reduced were the  $(\tau, D_t)$  scheme to be imposed, and vice versa. But is it reasonable to assume that the break-even bequest falls in this first zone of (14)? It is easy to check that condition (12) ensures that

$$B^* < \overline{B} < \overline{\overline{B}}.$$

The implication of this is that the break-even bequest lies somewhere in the zone where individuals choose to work. For those in the wealth range above that

zone, the  $(\tau, D_t)$  scheme unambiguously reduces their wealth and may induce some previously non-working individuals to supplement their reduced wealth with earnings in the labor market.

#### 4.2. Long Run

In the long run it is no longer satisfactory to assume that certain components of the model are exogenously determined by factors that lie in the past. Specifically, we should allow for the fact that if a redistribution scheme is introduced in generation  $t_0$ , then all the planned bequests made in generations  $t \geq t_0$  will be affected by the scheme. We need to extend the model to allow for this and examine the nature of equilibrium in the extended model.

The model is extended by linking together the generations through their bequest behavior. From (1) and (5), we have the following difference equation in wealth:

$$W_t = D_t + E_t + \frac{2\beta[1-\tau]}{k} W_{t-1}. \quad (15)$$

The difference equation is complicated by two things: (1) the size of  $D_t$ , the demogrant in period  $t$ , depends on  $\bar{W}_{t-1}$ , the wealth distribution at  $t-1$  through the government budget constraint (6) which is assumed to hold at every  $t$  and (2) the size of  $E_t$ , earnings in period  $t$ , depends on  $W_t$ , the individual's wealth at time  $t$  through equation (2).

Equation (15), combined with information about the distribution of families by size, determines how the wealth distribution changes over the generations:  $F_t \rightarrow F_{t+1}$ . We have an equilibrium distribution if, for all  $t$ ,  $F_t = F_{t+1} = F^*$ , which enables us to characterize the long-run equilibrium in which we can analyze bequest/inheritance taxation. Of course, the government budget constraint has to hold for every wealth distribution in every period: so in the equilibrium distribution we have a demogrant  $D^*$ . We compare the long-run effects of bequest taxation schemes by comparing the equilibrium wealth distribution  $F^*$  for different variants of the scheme  $(\tau, D^*)$ . Finding the equilibrium distribution will, in general, involve numerical estimation or simulation. But, in simple cases, we can determine the changes in  $F_t$  and the equilibrium distribution  $F^*$  analytically; such simple cases are useful in understanding the nature of the long-run equilibrium and as a benchmark for richer versions of the long-run equilibrium.

#### 4.3. A Special Case

Let us focus on a simple case where earnings are zero (typical of the upper tail of the distribution as we may deduce from (2)) and where the demogrant is zero – for example, the case where the demogrant is tapered at high wealth levels.

To set up the connections between distributions in successive generations, as mentioned in Section 4.2, we first need assumptions about the distribution of families and the nature of family formation. Specifically, we assume the following:

- Strict assortative mating (so that in any family the parents have equal wealth).
- There is a given distribution of families by number of children ( $p_1, p_2, \dots, p_K$ ) where  $p_k \geq 0$  is the proportion of families with  $k$  children,  $\sum_{k=1}^K p_k = 1$ .
- The population is stationary, so that

$$\sum_{k=1}^K k p_k = 2.$$

- There are no families with zero children or with more than  $K$  children.
- People inherit only from their parents.

Given that there is a proportion  $p_k$  of families with  $k$  children then, for an arbitrary  $W$ , the following must be true:

$$F_t(W) = \sum_{k=1}^K \frac{1}{2} k p_k F_{t-1} \left( \frac{kW}{2\beta[1-\tau]} \right), \quad (16)$$

which gives the connection between  $F_t$  and  $F_{t-1}$ . Equilibrium requires that the distribution function remains unchanged through the generations, so that  $F_{t-1} = F_t = F_*$ , for all  $t$  in (16). [Cowell and Van de gaer \(2017\)](#) show that the equilibrium distribution  $F_*$  that satisfies this equation must take the form of a Pareto distribution:

$$F_*(W) = 1 - AW^{-\alpha}, \quad (17)$$

where  $A$  and  $\alpha$  are constants. Substituting the form (17) into (16) the parameter in the equilibrium distribution is found from the equation

$$\sum_{k=1}^K p_k \left[ \frac{k}{2} \right]^{1-\alpha} = [1-\tau]\beta^{-\alpha}. \quad (18)$$

From this we find that a higher  $\tau$  is associated with a higher  $\alpha$ : this means that increasing the tax rate on bequests (inheritances) must reduce inequality.

## 5. REDISTRIBUTION AND PREDISTRIBUTION

The concepts of long- and short-term equilibrium give us a convenient way to distinguish between simple redistribution by a tax-demogrant scheme and what has come to be known as “predistribution.” Redistribution is usually thought of as the apparent impact of taxes and transfers on the inequality existing at a point in time; predistribution refers to the way that government policy may have already acted to change the distribution previous to this point in time.

The short-run equilibrium analysis discussed in Section 4.1 is close to many routine studies of tax incidence. We only have one behavioral response to consider, the change in earnings that may arise when a person’s wealth is altered by

the introduction of the tax-cum-demogrant scheme. The short-run redistributive impact of the scheme can be considered by looking at the inequality of wealth implied by (10) and comparing it with that implied by (8). Of course, this is conditioned on a particular set of bequests from the previous generation.

The long-run analysis in Section 4.2 allows for an extended feedback response of behavior as bequests adjust, generation by generation. We only compare redistribution schemes, or compare a new redistribution scheme to a world without redistributive bequest taxes and demogrant, in the context of equilibrium distributions. Imagine that a tax reform takes place at  $t_0$  and that after a further  $t_* - t_0$  periods (generations) the system has reached the new equilibrium distribution. Then, in period  $t_* + 1$  we could carry out a redistributive analysis in terms of both short- and long-run equilibrium. The short-run analysis is similar to what we have described in the previous paragraph, but with the exogenous bequests being those that apply in the equilibrium distribution reached at  $t_* - t_0$  under the tax-cum-demogrant scheme. The *long-run analysis* compares the equilibrium distribution at  $t_*$  (by definition the same as the distribution at  $t_* + 1$ ) with the equilibrium distribution that was in force just before the tax reform at  $t_0$ . We could consider the *short-run analysis* at any of the  $t_* - t_0$  periods. It is interesting to think through the apparent redistributive effect viewed at  $t_* + 1$ : the short-run view, just discussed, takes the structure of bequests made in generation  $t$  as exogenously given; the long-run view takes account of the whole process that was triggered by the tax reform at  $t_0$  and that has worked out through the  $t_* - t_0$  periods to result in the bequests associated with the new equilibrium distribution.

## 6. AN ILLUSTRATION

As an illustration we investigate the effect of a 30% tax rate on bequests that is used to fund an across-the-board flat demogrant so that the government budget is balanced. We do this for a society in which there is strict assortative mating and in which there is perhaps the simplest possible case of differential family structure, where the distribution of families by number of children  $(p_1, p_2, p_3) = (0.5, 0, 0.5)$ .<sup>1</sup> We further assume that the parameter  $\beta$  (the savings rate times the growth factor of wealth) takes the value 0.95.

Consider a situation where the economy is in a long-run equilibrium with  $\tau = 0$ : no bequest tax. Our first task is to simulate the long-run distribution of wealth given the parameter values we have just stated and following the dynamics explained in Section 4 and set out in more detail in Cowell and Van de gaer (2017). The equilibrium distribution has a Paretian upper tail where (18) gives the equilibrium value of Pareto's  $\alpha$ : for these parameter values we find  $\alpha = 1.355$ . The Gini coefficient corresponding to the Pareto tail alone – in other words for inequality among the rich in isolation – would take the value 0.5848. But the equilibrium distribution is not Paretian throughout its support – see Cowell and Van de gaer (2017) for an explanation. The empirical approximation to this equilibrium distribution is depicted by the shaded histogram in Fig. 1. The Gini coefficient for the empirical approximation to the original equilibrium is 0.6913 – see

the “before” column of the “short run” row in Table 3. This total inequality incorporates (a) the component consisting of the within-group inequality of those with wealth in the upper tail (0.5848), (b) the within-group inequality of all the non-rich, and (c) the between-group inequality arising from the difference in means between the rich and non-rich groups.

Now suppose that the 30% bequest tax is introduced; along with a uniformly provided demogrant satisfying (7). As explained in Section 5, there is a short-run behavioral effect consisting of the labor supply response by those at the bottom of the distribution (people whose wealth lies in the Pareto tail do not work). The unshaded histogram in Fig. 1 depicts the wealth distribution after the short-run impact of the bequest tax and demogrant. The “after” column of the “short run” row in Table 3 shows the inequality that emerges when one takes into account just the one-round short-run impact of the tax.

The distribution represented by the unshaded histogram in Fig. 1 is not an equilibrium for this economy. We now simulate the new long-run equilibrium by iteration using the dynamic equation (15). The resulting equilibrium from this iteration is shown in Fig. 2, where the distributions have broadly the same interpretation as in Fig. 1: the shaded histogram represents the notional pre-tax (and pre-demogrant) wealth distribution in equilibrium; the unshaded histogram represents the distribution of disposable wealth in long-run equilibrium. The bottom row in Table 3 shows the Gini coefficient for each of these two distributions in Fig. 2.

The “redistribution” effect can be seen by either of the two rows in Table 3: we can see that the impact effect of the bequest-tax combined with the demogrant that it funds appears to reduce wealth inequality by around a quarter. From either of the two columns in Table 3 we can get an estimate of the “predistribution” effect – it is clear that this is much larger in that the Gini coefficient is reduced by just under 60%. The overall effect of introducing the tax and demogrant is found by comparing the bottom-right corner with the top-left corner: in this case the Gini coefficient is reduced by almost 70%.

7. CONCLUSIONS

The simplified calculations presented in Section 6 convey an important lesson that should be taken to heart by policy-makers. It is certainly true that in almost all implementations of bequest or inheritance taxation the rates and the coverage have been modest and, as a consequence, the immediate impact in terms of revenue raising is also modest. However, this misses an important point concerning the economic and social process that is associated with the tax base. Changing the

Table 3. Gini Coefficient Before and After Tax.

	Before	After
Short run	0.6913	0.5168
Long run	0.2811	0.2174

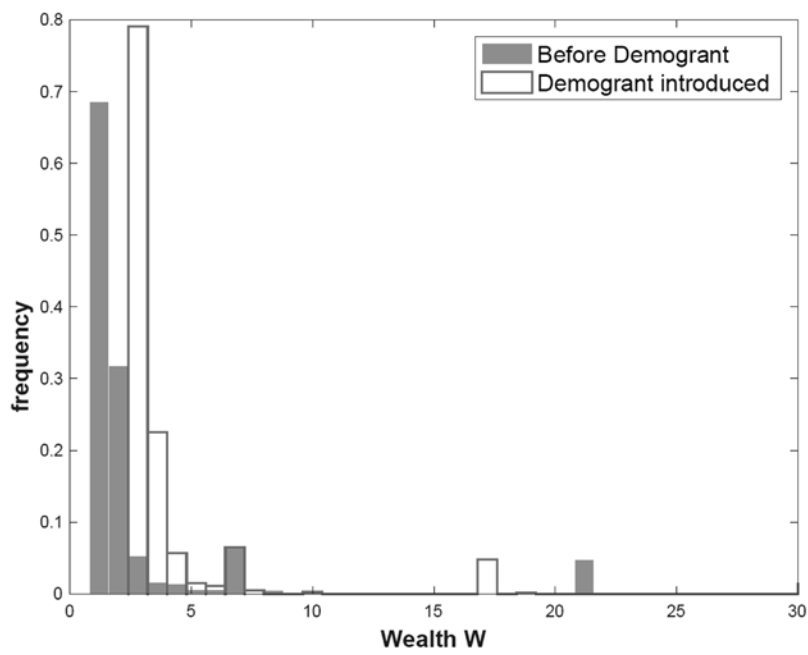


Fig. 1. Bequest Tax and Demogrant – Short-run Impact.

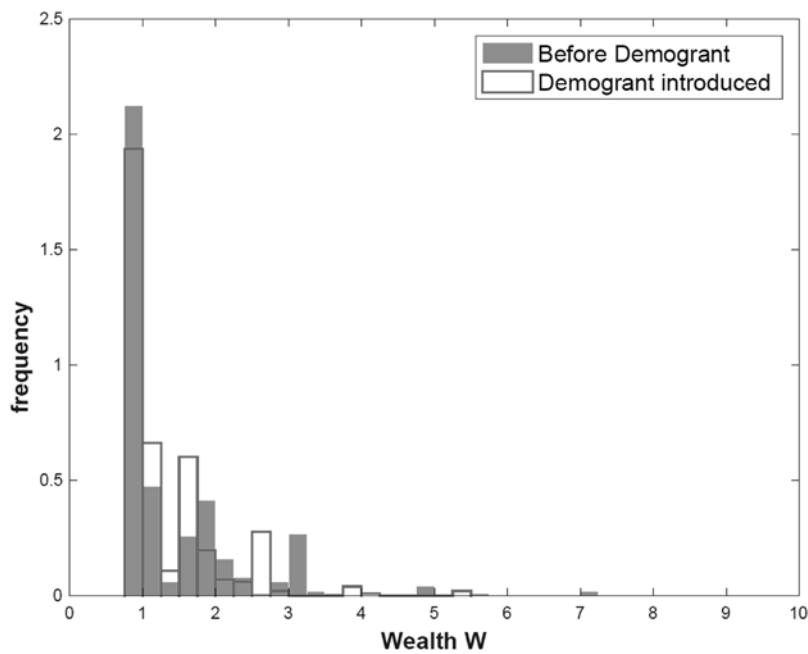


Fig. 2. Bequest Tax and Demogrant – Long-run Equilibrium.

tax rate, or abolishing the tax altogether, will change the amounts passed on from one generation to the next and will thereby change the amounts of wealth accumulated in different parts of the distribution: the wealth distribution in subsequent generations changes and so the long-run equilibrium distribution of wealth changes. This long-run effect – the “predistribution” effect of the tax – will typically be much larger than the short-run impact of the tax. A modest bequest or inheritance tax can indeed be a powerful engine of long-run change.

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