Normative Considerations in the Formulation of Distributive Justice

Writings on distributive justice often formulate the question in terms of whether for any given level of income, what is the impact on the overall degree of inequality, and on the least advantaged members of society. We present here a simple framework through which this proposition may be expressed, and then link it to a key underlying factor involving the degree of inequality and the rate of economic growth, namely, perceptions of and responses to risk. Finally we propose to frame these principles as a function of political legitimacy from which governance is derived.

A Simple Model of Distributive Justice

In a society in which government performs a function of distributive justice, we need to account for several considerations: 1. The initial level of income; 2. The tax rate and the overall level of tax revenues; 3. The redistribution of total tax revenues; and 4. Within each step, a measure of individual utility and total social welfare.

Table 1 below illustrates an economy composed of three individuals, A, B, and C. The initial distribution of income among these individuals is $200, $400, and $800, respectively, for a total of $1,400. In this initial framework, a flat tax rate of 10 percent is imposed, generating total tax revenues of $140. Based on this flat rate tax structure, all tax revenues are to be redistributed (that is, no revenues are used to produce specific goods and services), and there are no transfer costs. This distribution is based on an equal per capita allocation of tax revenues across the three individuals, and on a unitary marginal utility of income measure.

Table 4.1
Income Distribution in a Three-Person Society
with A Constant Marginal Utility of Income

	Income Function	Pre-Tax Total Utility	Tax Rate	Taxes Collected	Net Income Before Tax Redistribution	Pre-Distribution Total Utility	Net Income After Tax Redistribution	Post-Tax Distribution Total Utility
A.	$U_A = (\$200.00)^{1.00}$	200.00	10.00%	$20.00	$180.00	180.00	$226.67	226.67
B.	$U_B = (\$400.00)^{1.00}$	400.00	10.00%	$40.00	$360.00	360.00	$406.67	406.67
C.	$U_C = (\$800.00)^{1.00}$	800.00	10.00%	$80.00	$720.00	720.00	$766.67	766.67
	Income:	Utility:		Taxes:	Income:	Utility:	Income:	Utility:
Totals:	$1,400.00	1400.00		$140.00	$1,260.00	1260.00	$1,400.00	1400.00

In purely income terms, we see that Net Income after Tax Redistribution increases income for individuals A and B, while reducing income of individual C. What can we say about this static redistributive process?

There are several ways to answer this question. First, we can use our Champernowne Inequality Index, $I = 1 - g/x$, to measure initial inequality and the degree of inequality after government intervention.

Table 4.2
Inequality Across Three Stages of Government Redistributive Intervention

	Inequality Index:	Geometric mean	Arithmetic mean
a. Pre-tax inequality and total social	0.1429	$400.00	$466.67
b. Before redistribution of tax receipt	0.1429	$360.00	$420.00
c. After redistribution of tax receipts	0.1141	$413.44	$466.67

Table 2 shows the results of intervention over three stages. The pre-tax inequality level stands at 0.1429. Based on a flat tax regime, the imposition of taxation reduces the level of income (as shown by the arithmetic and geometric means), but the degree of income inequality is unaffected. Under the third stage, given that all tax revenues are redistributed, the mean level of income is restored to its original level, but with a higher geometric mean, we now have a lower index of inequality than the initial condition, that is, 0.1141 in comparison to 0.1429. Under this overall process, per capita income is unaltered while inequality in the distribution has been reduced.

Let us now consider various criteria by which this, and other tax and spending choices, may be viewed. The three standards we apply here are the Pareto, Kaldor, and Rawls criteria. Under the Pareto criterion, because an effort to achieve greater equality is realized by a reduction in income for at least one individual, this program of redistribution would not be acceptable. Under the Kaldor criterion, as long as the gainers exceed the losses of the losers, such a program could be acceptable. But since the income gains of the gainers are exactly equal to the losses of the loser, this program also fails to meet this standard. Finally, under a Rawlsian standard, because the income of the least advantaged individual has been increased, it would be considered as an improvement.

Thus far, we have pursued this question exclusively in terms of income. Let us now take a look in terms of individual and social utility. "Utility" has a long pedigree in philosophy but is difficult to incorporate into economic analysis because it is not directly observable. But to facilitate matters, we have characterized a utility function for the three individuals, as is shown in Table 1.

The utility function is based on a formula in which the income of each individual is taken to some exponential value, in this case, 1 for each individual, respectively. These numbers can be interpreted as stating what is the utility from an extra dollar's worth of income that each individual receives. When applied to the initial levels of income, we see that initial utility levels are 200, 400, and 800, respectively, for an initial level of social utility or welfare of 1,400.

Based on the intermediate step of the imposition of taxes, not only in income reduced, but so too is the level of utility. At this stage, the respective levels of utility are 180, 360, and 720, respectively, for a total of 1,260.

In the final stage in which all tax revenues are redistributed, we now re-compute individual utility. Again from Table 1, the results are in the last column, at 226.67, 406.67, and 766.67, respectively, for a total of 1,400.

We now have a basis from which we can note that the degree of income inequality has been reduced, while maintaining the same level of total social welfare (total social utility). In relative terms, income inequality has been reduced by 20.2 percent, while total social welfare remains unchanged. For some, even if total social welfare under this regime has not increased, distributive justice has been expanded by a reduction in income inequality.

Let us now consider a re-computation of inequality based on utility alone. In this case, inequality of utility initially stands at 0.1429, then falls to 0.1141 once redistribution has taken place. Where total social welfare remains unchanged over this redistribution, inequality in utility has been reduced.

What about our three criteria? The utility framework fails the Pareto standard because the utility of the wealthiest individual falls form 800 to 720, even though there is an increase, respectively from 200 to 226.67 for individual A and from 400 to 406.67 for individual B. But because total social utility remains unchanged, our utility framework fails to satisfy the Kaldor standard, even though it meets the Rawlsian standard in that the total utility of the least advantaged individual has been increased.

Using our three-person economy, we now can examine various alternative formulations of income redistribution and distributive justice. In Table 3, we use a proportional tax rate but an equal per capita tax revenue redistribution approach in which the marginal utility of income is the same across all individuals.

Table 4.3
Income Distribution With A Progressive Income Tax

	Income Function	Pre-Tax Total Utility	Tax Rate	Taxes Collected	Net Income Before Tax Redistribution	Pre-Distribution Total Utility	Net Income After Tax Redistribution	Post-Tax Distribution Total Utility
A.	$U_A = (\$200.00)^{1.00}$	200.00	5.00%	$10.00	$190.00	190.00	$246.67	246.67
B.	$U_B = (\$400.00)^{1.00}$	400.00	10.00%	$40.00	$360.00	360.00	$416.67	416.67
C.	$U_C = (\$800.00)^{1.00}$	800.00	15.00%	$120.00	$680.00	680.00	$736.67	736.67
	Income:	Utility:		Taxes:	Income:	Utility:	Income:	Utility:
Total	$1,400.00	1400.00		$170.00	$1,230.00	1230.00	$1,400.00	1400.00
Inequality Index	0.1429	0.1429		0.3587	0.1229	0.1229	0.0935	0.0935

Here again, levels and changes in income are proportional to utility. As in our first iteration, income inequality is reduced, as is utility inequality. Using income comparisons alone, only the Rawlsian standard would be satisfied, which also is the case when utility comparisons are made.

How does a proportional redistribution of tax revenues work? Here we take the progressive income tax rates of 5, 10, and 15 percent and use them as proportions for the distribution of revenues. Under this arrangement, individual A would receive 16.67 percent, individual B would receive 33.33 percent, while individual C would receive 50 percent.

Table 4.4
Income Distribution with a Progressive Income Tax and Proportional Redistribution

	Income Function	Pre-Tax Total Utility	Tax Rate	Taxes Collected	Net Income Before Tax Redistribution	Pre-Distribution Total Utility	Net Income After Tax Redistribution	Post-Tax Distribution Total Utility
A.	1.00 $U_A = (\$200.00)$	200.00	5.00%	$10.00	$190.00	190.00	$218.33	218.33
B.	1.00 $U_B = (\$400.00)$	400.00	10.00%	$40.00	$360.00	360.00	$416.67	416.67
C.	1.00 $U_C = (\$800.00)$	800.00	15.00%	$120.00	$680.00	680.00	$765.00	765.00
	Income:	Utility:		Taxes:	Income:	Utility:	Income:	Utility:
Total	$1,400.00	1400.00		$170.00	$1,230.00	1230.00	$1,400.00	1400.00
Inequality Index	0.1429	0.1429		0.3587	0.1229	0.1229	0.1186	0.1186

Under this arrangement, redistribution meets only the Rawlsian standard in terms of either income inequality or utility inequality, even though inequality under an income or utility standard is reduced from 0.1429 to 0.1186.

Instead of a myriad of iterations, let us apply just one additional calculation, based on a standard of justice implied by John Stuart Mill, namely, that a shift toward a more equal distribution can lead to an improvement in social welfare. Here we apply our original flat tax rates and equi-proportional tax revenue distribution formulas, but use a diminishing marginal utility of income formulation, as shown in Table 5.

Table 4.5
Income Distribution with Proportional Tax and Redistribution
And a Diminishing Marginal Utility of Income

	Income Function	Pre-Tax Total Utility	Tax Rate	Taxes Collected	Net Income Before Tax Redistribution	Pre-Distribution Total Utility	Net Income After Tax Redistribution	Post-Tax Distribution Total Utility
A.	1.20 $U_A = (\$200.00)$	577.08	10.00%	$20.00	$180.00	508.54	$226.67	670.60
B.	1.00 $U_B = (\$400.00)$	400.00	10.00%	$40.00	$360.00	360.00	$406.67	406.67
C.	0.80 $U_C = (\$800.00)$	210.12	10.00%	$80.00	$720.00	193.14	$766.67	203.09
	Income:	Utility:		Taxes:	Income:	Utility:	Income:	Utility:
Total	$1,400.00	1187.20		$140.00	$1,260.00	1061.68	$1,400.00	1280.36
Inequality Index	0.1429	0.0784		0.1429	0.1429	0.0725	0.1141	0.1069

Under this configuration, while total income levels remain unchanged after redistribution, the level of total social welfare increases, from 1187.2 to 1280.36, while the degree of income inequality falls, from 0.1429 to 0.1141. But using a utility metric, utility inequality increases from 0.0784 to 0.1069.

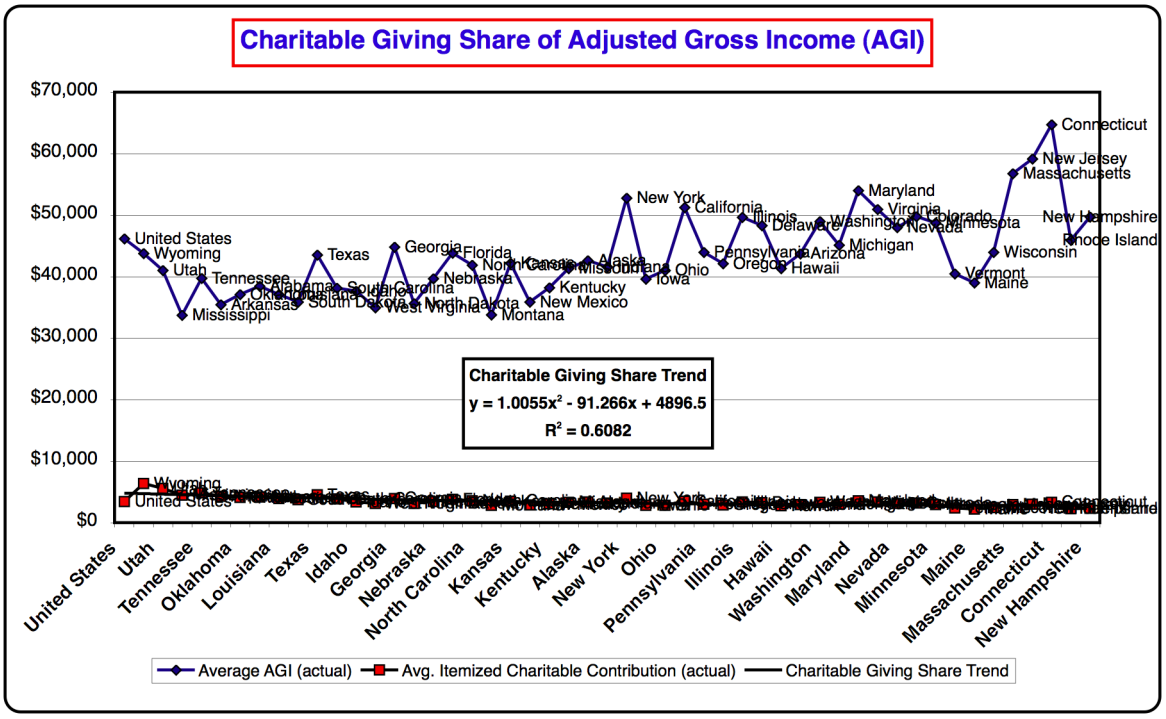
Where does this leave our normative concern about distributive justice? Inequality, as measured in terms of income or utility, is affected directly by the progressivity/regressivity of tax rates, as well as the degree of progressivity/regressivity in terms of the distribution of tax receipts. While governments routinely impose nominal schedules of taxation, and implement various programs of redistribution, what is often missed is whether total social welfare is increased or decreased, and what this implies in terms of an inclusive system of governance, and thus the question of political legitimacy.

Politicians routinely make judgments about the utility of income every time they propose or vote on tax and spending legislation. They also do so typically without a closer understanding of the combined effects of tax and spending legislation on the level and distribution of income and social welfare. If we look at the political spectrum, egalitarians on the Left base their argument on the implicit proposition that the loss in marginal utility of income from higher income individuals is less than the gain in utility to recipients at lower income levels. Conservatives contend just the opposite, while centrists would base arguments for distributive justice based on an implicit constant marginal of income standard.

Do we have any way to derive some empirical insight as to the implied marginal utility of income? One way of addressing this question is in terms of charitable income contributions. If the marginal utility of income is inversely related to the level of income, as John Stuart Mill suggested, and as illustrated in Table 5, then one would expect the share of income devoted to charity to increase with the level of income.

To test this proposition, we use state-level income tax data provided by the Charitable Giving Foundation over the 50 states of the U.S. This enables us to compare the share of income devoted to charity over various levels of per capita income.

Figure 4.1



Using the data from Figure 1, we find that there is an inverse relationship between the charity giving share of income and the level of income across the states. We then develop an estimating relationship in which the dependent variable is the charitable giving share of income, with income as the independent variable. The results are as follows:

Table 4.6

SUMMARY OUTPUT - **Dependent Variable is AGI Charitable Giving**

Regression Statistics	
Multiple R	0.6432
R Square	0.4137
Adjusted R Square	**0.4017**
Standard Error	0.0919
Observations	51

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.2917	0.2917	34.5703	3.5849E-07
Residual	49	0.4135	0.0084		
Total	50	0.7052			

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	**4.4393**	**0.9440**	**4.7027**	0.0000
Log AGI	**-1.1974**	**0.2037**	**-5.8796**	0.0000

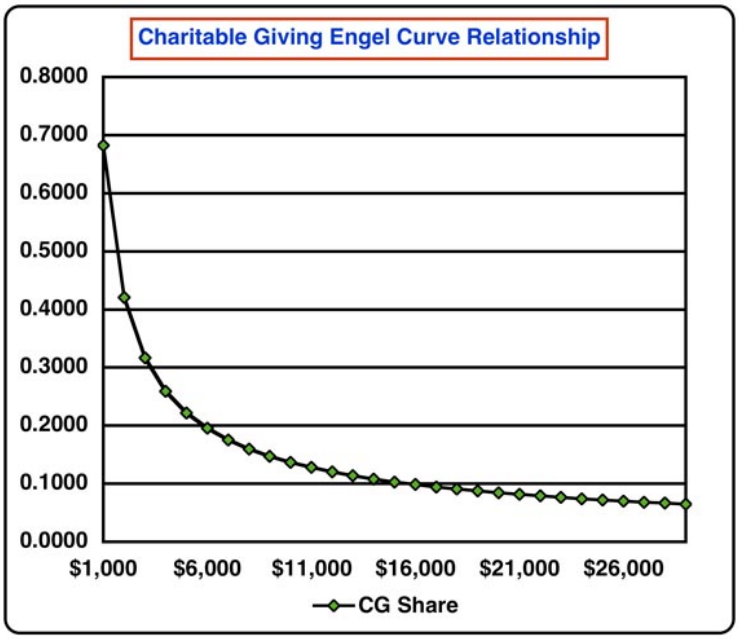
Transforming the above estimates into a standardized income utility equation, we obtain:

(1.) **Estimating Equation:**

$$AGI\ CG = 84.71\ Y^{0.3020}$$

A negative coefficient of the log value of income shows that the marginal utility of income is positive. When we use this equation to plot the relationship, we get the following Engel curve (which portrays the share of income devoted to the purchase of a good and the level of income).

Figure 4.2



The simplest conclusion we draw from this that the marginal utility of income is positive and is a necessity (surprise, surprise!). But we now face the question of whether this negatively sloped Engel curve relationship winds up generating levels of charitable giving in ways that meet some higher test of distributive justice, as in the case of maximizing life expectancy across income groups. Since under the prevailing distribution of income in the U.S. we have individuals and households living in poverty (both relative and absolute), charitable giving, which is encouraged through charitable giving tax deductions, may be insufficient in meeting a broader standard of distributive justice.

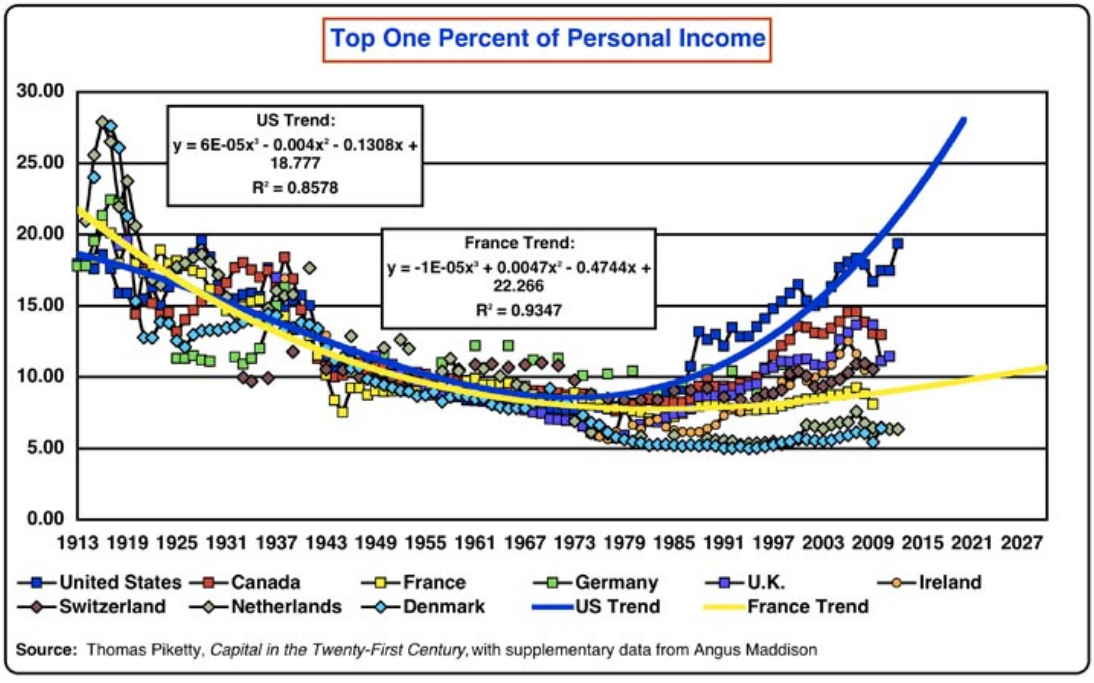
Does the failure of charitable giving to satisfy a life expectancy or some comparable standard of distributive justice automatically justify the kinds of government intervention already in place. Already we have seen that even with the expansion of transfers, income inequality in the U.S. has been increasing, and that it has been doing so in the presence of the twin incentives of charitable giving as well as public transfer expenditures made in the name of the poor.

The Piketty Perspective

In a recently published study, Paris School of Economics professor Thomas Piketty has gathered data on wealth and income for several economies over a broad period of time, in some cases going back more than 200 years. In *Capital in the Twenty-First Century*, he argues that the rate of return to capital as broadly defined wealth exceeds the rate of economic growth, with the result that inequality of income over time is prone to increase. For Piketty this means that the ratio of capital to income is increasing, and that it thus far has failed to experience diminishing marginal rates of return that one would associate with any set of variable to fixed inputs.

While some have criticized his work for various omissions, including what impact transfer payments have on inequality, Piketty stands by his conclusion and puts forth a policy recommendation to bring the rate of return to capital more in line with the rate of economic growth. That recommendation is straightforward: since the wealthy do most of the saving and since their rate of return on wealth exceeds the growth rate of the economy, one should adopt a steeply progressive income tax as well as a significant increase in the tax rate on inherited wealth. These larger tax revenues would accomplish the twin objective of brining net returns more in line with the rate of economic growth, and at the same time enable sufficient transfers to reduce the prevailing degree of income inequality.

Figure 4.3



Piketty's estimates indicate that as income inequality is on the rise in the U.S., France has succeeded in reducing the overall degree, as well as any subsequent increase. In his view, this relates squarely to policies adopted in France on incomes and wealth, and which he finds is a normative example by which all countries could address this question.

Data reporting problems aside, how should we view the Piketty proposals? What is missing in the analysis is no accounting for the impact of any degree of income inequality on an economy's rate of economic growth. That is, inequality should not be viewed simply at a given moment in time but rather over time in which the impact of inequality reducing fiscal measures may have a negative effect on an economy's rate of economic growth. This is not to say that no public intervention may be warranted, but that the analysis put forth is incomplete if viewed only in static terms.

If dynamic income inequality has some predictable effect on the rate of economic growth, what could serve as some optimal level of redistributive taxation in relation to the rate of economic growth? Piketty gives us an argument to reduce the rate of return to capital down to the level equal to an economy's rate of economic growth. He says that short of some peacetime fiscal intervention, only in the presence of economic recessions and depressions, as well as during wartime do we have an equalization of the rate of return to capital brought to equality with the rate of economic growth, and he favors neither as a solution to inequality.

This said, and assuming that one could fix income and estate tax rates at some socially defined optimal level, how would this work in practice? Piketty is a bit vague on this, but notes the presence of tax havens as a significant constraint on achieving a more harmonious equality of rates of return to capital and economic growth within and across economies. In our view, measures to eliminate tax haven differentials could only become effective by a transfer of governance authority to an international agency, and in the present environment, the prospect of countries' ceding national sovereignty to any degree to an international authority seems limited at best.

Distributive Justice in the Context of Risk, Innovation, and Economic Growth

Does this satisfy all of our concern about inequality and economic growth in a framework of distributive justice? Not quite. One consideration largely absent in Piketty's analysis is the role of risk in generating both economic growth and economic inequality.

Risk, which can be measured in absolute terms of a standard deviation from a mean sample and in relative terms as the coefficient of variation, arises in many contexts. They include political, economic, financial, and environmental risks, and to the extent that risk in any of these categories constitutes a significant share of total costs, markets tend to break down, leading to corrective actions. These corrective actions take the form of subsidies in the presence of external benefits and taxes and regulation in the presence of external costs. But measuring risk in an ex ante context is difficult to do, forcing any corrective measures to be filtered largely from historical experience.

Distributive justice can be shaped to no small extent on how one perceives and responds to the presence of risk. Risk-taking is inevitable in any economy in which imperfect information exists, but achieving a measure of distributive justice while promoting increases in social welfare also requires that one incorporate measures that can reduce the

level of risk, wherever it arises.

Risk is often opaque and difficult to estimate ex ante. Yet over the years, economists have used standard deviation and coefficient of variation measures on historical data to derive various risk-management tools. All of these tools can reduce risk, through diversification and hedging, but none can eliminate risk. Nor, it should be noted, can we readily craft public policies in a consistent fashion when it comes to attitudes toward risk over time, leaving open in the end how attitudes toward risk can result in unequal outcomes, and thus affecting in fundamental ways the level of distributive justice.

Figure 4.4

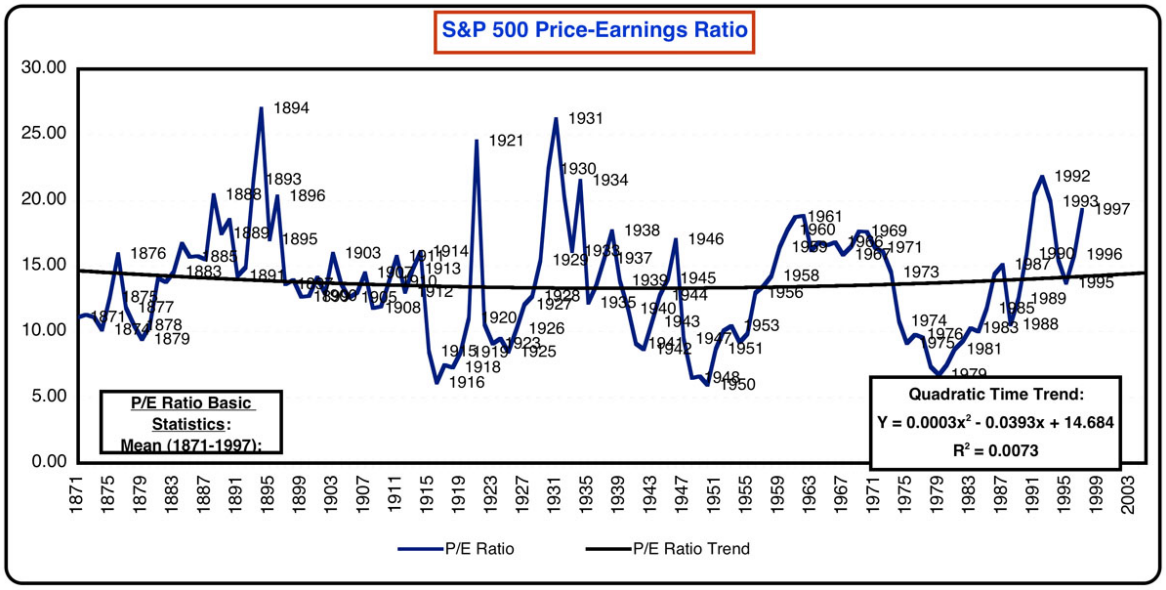


Figure 4.5

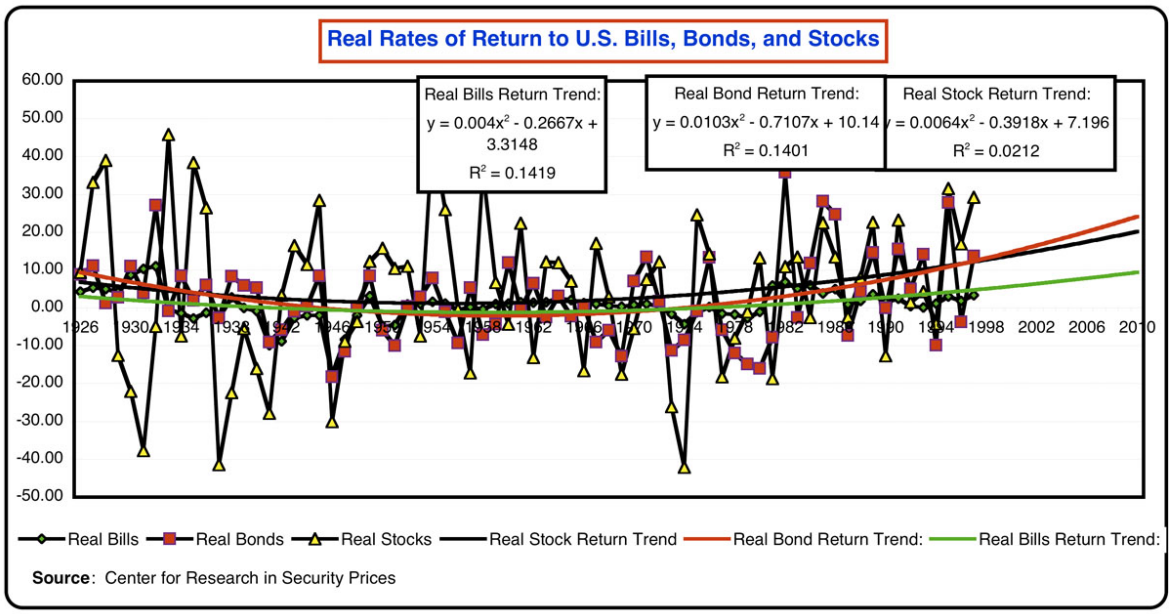


Table 4.7

	Alternative Distributions			
	A. Blue	B. Red	C. Yellow	D. Green
π = Pi	3.14159	3.14159	3.14159	3.14159
e = Natural Log.	2.71828	2.71828	2.71828	2.71828
μ = Arithmetic Mean:	49.50	49.50	108.03	108.03
σ = Std. Deviation:	29.01	20.72	40.63	56.90
c.v. = Coeff.Variation:	0.5861	0.4185	0.3761	0.5267
Cumulative area:	0.9996	1.0000	0.9999	0.9947
Kurtosis:	0.0349	1.6616	-0.9726	-1.4245
Champernowne Inequality:	0.1224	0.2806	0.3756	0.1645

Figure 4.6

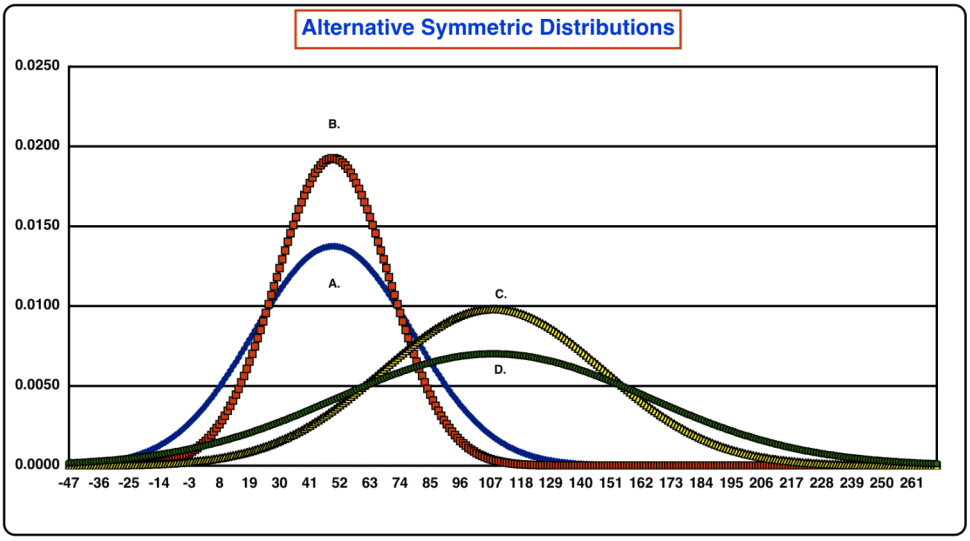


Figure 4.7