

ISSN 1936-5349 (print)  
ISSN 1936-5357 (online)

# HARVARD

JOHN M. OLIN CENTER FOR LAW, ECONOMICS, AND BUSINESS

## THE UNINTEGRATED ECONOMICS OF CORPORATE TAX INTEGRATION

William D. Andrews

*Draft of September 2000*

Discussion Paper No. 976

10/2018

Harvard Law School  
Cambridge, MA 02138

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Harvard Law School Program on Corporate Governance

# **The Unintegrated Economics of Corporate Tax Integration**

*William Andrews*

Harvard Law School

Draft of September 2000. Published October 2018.

This paper is an unfinished work of William D. Andrews, who was the Eli Goldston Professor of Law at Harvard Law School and a premier tax scholar of his generation. This substantial but not fully completed manuscript was found among his papers after his death on May 20, 2017. It examines significant details of the economic analysis contained in the 1992 Treasury Corporate Integration Report. Although that report is now more than twenty-five years old and this draft was written nearly two decades ago, the problems Andrews identifies in the report remain relevant today. We have chosen to publish the work unedited except for minor formatting changes (due in part to the conversion of a photocopy to Word) and a handful of minor corrections. Bill did not write an abstract, so the one appearing below is our description of his paper.

Louis Kaplow and David Weisbach

## **Abstract**

This paper examines the economic analysis of the effects of corporate integration contained in the 1992 Treasury report on corporate integration. The core argument is that the central computable general equilibrium (CGE) models used to estimate the effects of the corporate tax (and the benefits of integration) assume free flows of funds between the corporate and non-corporate sectors whereas the Traditional View arguments for integration that are relied on by the Treasury assume the opposite, that the dividend tax imposes a charge on shifting funds out of corporate solution. After examining the structure of the CGE models in detail (using the Harberger two-sector model as an example), the paper shows how the assumptions made in these models are inconsistent with the assumptions made in the models of the tax effects of the financing decisions of corporations. The paper then considers some ways of potentially reconciling the two approaches.

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# The Unintegrated Economics of Corporate Tax Integration

*William Andrews*

Draft of September 2000. Published October 2018.

## I. Introduction

Corporate income is subject to the corporate income tax as accrued or received by a corporation. It is also subject to individual income tax when distributed to individual shareholders as dividends. (It may also be effectively subject to individual tax before distribution when shareholders sell their shares.)

Taxation to both the corporation and the shareholders is called the double taxation of corporate income.<sup>1</sup> Various schemes have been devised for ameliorating this double taxation: they are called integration of the corporate and individual income taxes.<sup>2</sup> Integration has long been advocated

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<sup>1</sup> "Double" is a slight misnomer, since the individual income tax only applies to what is left after imposition of the corporate tax. Thus if both taxes were 50 percent, their combined effect would be to take 75 percent, not 100.

<sup>2</sup> The principal scheme in actual use in other countries is one that allows individual shareholders to take credit against their tax liability for some or all of the corporate income tax paid with respect to the income out of which their dividends are paid. The effect is to convert the corporate income tax on distributed earnings into a prepayment of shareholder tax. A similar result could be achieved by just allowing corporations a deduction for dividends paid. What used to be called full integration would entail treating corporations generally like S corporations or partnerships; repeal the corporate income tax but tax shareholders on distributed and undistributed corporate income. An opposite approach is simply to repeal the individual income tax on corporate dividends, leaving the corporate income tax in place as the sole ordinary income tax on corporate income. All these methods of integration are discussed in the Treasury Report.

[Recently other countries have cut back on their integration, or considered it. Why? Incorporate that item somehow here.]

by many economists and lawyers and has been pursued at least partially in the income taxes of most other developed countries.

The simplest argument for integration is one of fairness: It is not fair to tax corporate income twice when other income is taxed only once. But fairness is a matter between people not things, and so the statement should be revised: It is not fair to tax corporate shareholders twice on their income while others are taxed only once on theirs. But then it becomes critical to know whether shareholders actually bear the burden of the corporate income tax. That burden might get shifted to others through adjustments in prices, wages and investment. Once one looks at the possibility of such shifting, and the degree to which people can choose among investment opportunities on an after-tax basis, it becomes very difficult to judge to whom the tax may be unfair.<sup>3</sup>

Today the main argument in favor of integration is one of efficiency.<sup>4</sup> Wherever the burden of the tax may come to rest, behavior will have been wastefully distorted from what it would have been in the absence of the tax. Lawyers are familiar with this phenomenon in the form of elaborate sometimes expensive arrangements that would not be undertaken but for their tax saving effect. In economists' terms, the loss is not just in what is done because of the tax but also in what is not done. The wage and price and investment adjustments that result from some taxes are likely to prevent the market from allocating resources in the best manner to produce a maximum amount of the goods consumers most want. Economists sometimes seek to estimate those losses in dollar or percentage terms. Lawyers may be tempted to accept (or sometimes reject) these economists' conclusions without fully understanding their implications or bases.

In 1992 the Treasury Department published a report advocating integration in the United States.<sup>5</sup> The Treasury Report describes several

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<sup>3</sup> See section II.A below for considerably more on the incidence of the corporate tax.

<sup>4</sup> [Besides Treasury Report, ALI; Aidinoff and Taylor?; McClure?; Blueprints?; Treasury I; others?]

<sup>5</sup> U.S. Department of the Treasury, *Integration of Individual and Corporate Tax Systems: Taxing Business Income Once*, January 1992. This is often referred to hereinafter

methods by which integration might be achieved or pursued.<sup>6</sup> (These are referred to as integration prototypes.) It also describes several economic models for estimating efficiency gains from integration and it provides a range of estimates for the several models applied to the several prototypes described.

On the basis of simulations using these models the Treasury Report estimates annual welfare gains of \$2.5 to \$25 billion, depending on the method of integration adopted and the model used for estimating. That represents 0.07 to 0.73 percent of total national consumption.<sup>7</sup> These welfare gains are said to be comparable to those predicted<sup>8</sup> for the Tax

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as the *Treasury Report* or simply the *Report*. Another report later in the year specifically advocated a particular plan of integration by simply exempting dividends from investor income tax. [Supply name and citation for December report.] In the longer run this treatment of dividends might be extended to corporate interest as well: no tax on the recipient and then of course no deduction for the corporate payor. The Treasury Report calls this extended corporate tax a Comprehensive Business Income Tax (CBIT).

<sup>6</sup> [Provide brief description here, particularly introducing CBIT. At some point there is a need for textual description of integration methods or prototypes as a basis for considering the variations in estimates. Maybe this can largely wait until section II.G. Treasury's Findings.]

<sup>7</sup> The tables in the Report also report efficiency gains "as a percentage of tax revenue from corporate capital"; this produces a range from 1.7 to 9.7 percent.

[This is with scaled tax rate replacement. Why isn't the range 1.7 to 17? Because of changes in "tax revenue from corporate capital"? I suppose CBIT does produce a considerable such increase.]

[Can a reader figure it out as a percentage of the revenue loss from integration? So you could say by not integrating we are suffering an extra burden of x just to collect y in tax? (I think it does appear that way later on.)]

<sup>8</sup> [Check to confirm the use of this word. I am interested because of Silberman's use of prediction to describe refutable predictions by which a scientific theory can be tested. If it is right, maybe it should be quoted. Silberman, *Economic Analysis* ...]

Reform Act of 1986.<sup>9</sup> These predicted efficiency gains are the chief basis on which the Report, and subsequent commentators, have urged integration.<sup>10</sup>

The 10:1 range in predicted efficiency gains results from differences in methods of integration considered and economic models used for estimating. The summary conclusion about gains is often cited without any attempt to describe what those differences are and how they affect the predictions.<sup>11</sup>

The Treasury Report cites and builds upon two main subjects in the prior economics literature. One is the use of Computable General Equilibrium (CGE) models for estimating the loss in aggregate welfare that results from imposing a higher tax burden in the corporate sector than in the rest of the economy. In short, the higher tax burden will lead to underinvestment in the corporate sector, and CGE models provide a mechanism for estimating the magnitude of that underinvestment and the welfare losses resulting from it.

The second subject has to do with corporate finance, and is an attempt to understand why corporations behave as they do. In particular, why do corporations pay dividends to the extent they do, and why don't they resort to debt finance much more than they do.

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<sup>9</sup> It is interesting that the comparison is with gains predicted for the 1986 Act rather than gains *achieved* by that Act; these "predictions" are not apparently the kind that can readily be tested by reference to subsequent actual experience. [More on this later.]

<sup>10</sup> Cf. ALI Report on Integration, which similarly cites elimination of economic distortions as the chief reason for integration, though without any attempt of its own to quantify such gains.

<sup>11</sup> The welfare gain of 0.07 is predicted for the dividend exclusion integration prototype by a model that only considers efficiency losses from misallocation of resources resulting from the increase in cost of corporate capital produced by the present system. The gain of 0.73 is predicted for the CBIT prototype, by a model that includes welfare losses from distortion of debt/equity ratios, dividend payout ratios, and the choice between corporate and noncorporate sectors for producing products that can be produced in either. Even in this model, the predicted gains for dividend credit and exclusion prototypes are only 0.16 and 0.19; staying with the first model, the highest gain predicted is 0.17 for the CBIT. Treasury Report 131, Table 13.7, 134, Table 13.8. [**This is pretty tough going; can it be made simpler?**]



While CGE models are now used to estimate efficiency gains and losses from a variety of tax and trade policies, they have their origin largely in early attempts to estimate welfare losses from the corporate income tax.<sup>12</sup> In the earliest precursors of the Treasury models there were just two sectors, corporate and noncorporate, the former with a corporate income tax on capital income and the latter free of tax. The behavioral assertion was that capital would flow between sectors until it earned the same after-tax return in both. The presence of two sectors and the focus on flow of resources between them was enough to earn the description of "general equilibrium" for even these early precursors. Modern versions subdivide the world into many more than two sectors, with many more distinguishing features than just the presence or absence of a corporate income tax, but their focus is still on how resources will flow over time. Modern versions take account of differences in corporate capital structures and investor-level tax burdens as additional factors affecting the flow of resources among sectors. They continue to assume that capital will flow freely in whatever direction is required, in the long run, to achieve equalization of after-tax returns.

The dividend problem is this: Why do corporations persist in paying dividends in the face of the substantially heavier individual income taxes on dividends than on share appreciation.<sup>13</sup> This work generally takes no account whatever of the corporate tax, presumably because that tax is payable on distributed and undistributed earnings alike. This work is not general equilibrium analysis because it is concerned with the behavior of actors within the corporate sector, not the flow of resources among sectors. The fact that payment of dividends to individual investors *is* a flow of funds out of the corporate sector is ignored.

Much of the work on the dividend problem is empirical; it looks to see how dividend behavior varies under altered individual income tax rates and regimes, and its models are evaluated by how well they fit available data. CGE models are also carefully fit to extensive data, but their predictions

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<sup>12</sup> [The other subject, according to Shoven et al, was foreign trade.]

<sup>13</sup> The tax on dividends is an immediate tax at full ordinary income rates; the tax on share appreciation is deferred and is likely to be at capital gain rates and is often eliminated entirely by step-up of basis at death.

concerning efficiency gains or losses are not about observable behavior susceptible to empirical testing. The central comparison in CGE models is not between a prediction and an observable outcome, but rather between the actual present (or future) state of affairs and what might have been if a different policy had been pursued.<sup>14</sup> The conclusions are more evaluative than predictive, and are not therefore subject to empirical testing.

These two bodies of work are addressed to different questions and grew up independently of one another. But both are clearly relevant to the integration question, and so the Treasury Report quite properly brings them both into its evaluation of integration prototypes.

But the assumptions and abstractions in the work on these two subjects are quite different. General equilibrium appraisal of the corporate income tax assumes free flow of funds in or out of the corporate sector, ignoring the fact that present law includes substantial taxes on corporate distributions. Much work on the dividend problem omits the corporate income tax, thus ignoring the fact that a corporate distribution has the substantial tax advantage of getting capital out of the corporate sector. A substantive integration of this prior work would require some reexamination of each subject in light of the other.

The Treasury Report unfortunately contains no such thing. It estimates welfare losses from misallocation of resources on the assumption that capital flows freely out of the corporate sector. It separately estimates welfare losses from the tax on dividends, staunchly denying that corporate income taxes have anything to do with them. These separately estimated welfare losses are then simply added together, ignoring the fact that the behavioral biases involved work in opposite directions.

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<sup>14</sup> [Check this with care.] [Also NB Shoven92 where the estimated state of affairs is repeatedly referred to as "counterfactual."]

The economics in the Treasury Report is thus fundamentally unintegrated, which is strange in a document whose purpose is to appraise and advocate tax integration.<sup>15</sup>

There<sup>16</sup> is prior professional economic work addressed to the combined effect of corporate and individual income taxes; it is referred to as expressing the "New View" of corporate income or dividend taxation. The Report discusses this work briefly,<sup>17</sup> as an alternative theory with respect to the dividend problem, but instead "adopts the framework suggested by the 'traditional view.'"<sup>18</sup>

This paper is a critical review of the economics set forth and cited in the Treasury Report. Its purpose is in large part to try to set forth the economics in a manner that lawyers interested in tax policy can (and should be required to) understand. A further purpose is to explain, for lawyers and economists, how the economic analysis in the Treasury Report falls short and runs astray.

Part II describes CGE models and their precursors and how they provide a basis for estimating welfare losses from misallocation of resources resulting from different levels of tax in different sectors of the economy. This is a fascinating business, well worth study both for fun and illumination. Part III is about the economic analysis of financial distortions in our taxation of corporate income—the bias in favor of debt over equity and the bias against payment of dividends—and how these are reflected in the Treasury Report. These parts are largely descriptive, but some critical

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<sup>15</sup> The notion of "unintegrated economics" is Alvin C. Warren's in *SPONTANEOUS CONVERSATION*, July 21, 1992.

<sup>16</sup> [Consider beginning this paragraph with a reference to ALI work. Then it can be suggested that: Similar insights are embodied in the professional economic literature sub nom New View. Etc.]

<sup>17</sup> Treasury Report 116-117, and associated notes.

<sup>18</sup> Treasury Report 191, n. 26.

points are made. Readers already familiar with this material may wish to skip directly to Part IV.

Part IV is the heart of the paper: it is a critical appraisal of the Treasury's failure to reconcile and integrate its economic analysis of financial biases into its general equilibrium models of investment bias. Part V is a restatement of the biases themselves on an integrated basis, in which the actors whose decisions might be distorted take account simultaneously of corporate and individual income tax effects. Part VI is a brief discussion of the New View of corporate income taxation, and the reasons given in the Treasury Report for rejecting it in favor of the so-called Traditional View. Part VII sets forth conclusions and further questions.

## II. Misallocation of Resources

The corporate income tax appears to impose a burden on corporate income from which other income is free. Its immediate primary effect is therefore to reduce the return to corporate shareholders. But if investors earn less after tax on corporate than noncorporate investment, they will refuse to make funds available to corporations unless the corporations earn enough more to cover the tax.

The result can be described in terms of cost of capital: What a corporation must earn to justify an investment is not just what its shareholders, actual and potential (the market), demand as a return, but that plus the associated corporate income tax. If shareholders demand a return of 6.5 percent on their investment, and there is a 35 percent corporate income tax, then the corporation can only make investments with a pretax return of 10 percent or more. The formula is

$$C = r/(1 - t) \tag{1}$$

where  $t$  is the extra tax on corporate income,  $r$  is the return demanded by investors, and  $C$ , cost of capital, is the pre-tax return the corporation must earn to provide investors with that return.

To begin with, one might think of  $t$  as the corporate income tax itself. But in the case of debt capital the interest deduction eliminates the

corporate income tax. And for stock that does not pay out all its earnings as dividends, the corporate income tax is offset to some degree by deferral and likely reduction or even elimination of investor tax burdens. So  $t$  means the corporate income tax rate minus an appropriate adjustment for these reductions.<sup>19</sup>

How will corporations meet this increased cost of capital? Perhaps they can reduce wages and thus shift some of the burden of the tax to labor. Or increase prices, passing it on to consumers. But then sales of corporate products are apt to decline.

If the corporate sector were a small part of the whole economy, then  $r$  would be essentially uninfluenced by the corporate income tax and could be taken as given. But the corporate sector is not small, and intersectoral flows of investment funds induced by the corporate tax may well be large enough to affect returns throughout the economy. What is needed, therefore, is a more general equilibrium involving both the corporate and noncorporate sectors.

#### *A. Harberger on Incidence*

In 1962, Arnold Harberger published a classic paper describing just such an equilibrium.<sup>20</sup> His topic in that paper was incidence, meaning who among the citizenry bears the burden of the corporate tax: Is it the corporate shareholders, or does the burden get shifted through higher prices or lower wages to customers or workers—or even through further adjustments to other investors. To investigate these questions, Harberger constructed a model in which production occurs in two sectors: a corporate sector, whose returns on capital are taxed, and a noncorporate sector, whose returns are nominally tax-free.<sup>21</sup> His general conclusion was that the burden of the tax

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<sup>19</sup> See further discussion in section II.D.1 beginning at p. 30 below. [Or maybe Part III.]

<sup>20</sup> Harberger, Arnold C., "The Incidence of the Corporation Income Tax," 70 *Journal of Political Economy* 215 (1962). [Shoven (1992) repeatedly cites Harberger 1959 and 1962 together.]

<sup>21</sup> In a later paper Harberger says what he really means is a heavily taxed sector and a lightly taxed sector, and classifies the crude oil and gas industry as part of the latter

would likely not get shifted to workers, or consumers as such, but would get spread proportionately to owners of all capital, noncorporate as well as corporate.

Before the imposition of any tax,<sup>22</sup> risk-adjusted rates of return in the corporate and noncorporate sectors should be equal. If because of innovation (or obsolescence) or for other reasons a discrepancy arises between risk-adjusted rates of return, capital will be attracted into the higher-return sector from the other. Any resulting shift of capital will tend to push rates of return down in the high-rate sector and up in the low-rate sector until equality of rates of return is restored. This represents a sensible mechanism by which capital can be continuously redeployed in response to changing needs and opportunities.

The immediate effect of a corporate income tax is to depress returns to equity investors in the corporate sector where it is applied. But this has the same effect as any other reduction in corporate rates of return: Capital, seeking maximum net returns, will flow from the corporate into the noncorporate sector. The resulting reduction in capital in the corporate sector and increase in the noncorporate sector will drive pretax returns up in the former and down in the latter until equality of after-tax returns is restored.<sup>23</sup> As a result, the burden of the tax (lower after-tax rate of return)

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because of the tax preferences given these activities, even though they are for the most part carried out by corporations. Harberger (1966), n. 56 below.

<sup>22</sup> [Move this note to a more relevant location.] There is an explicit assumption of no other distortions in Harberger (1966) at p. 109.9:

"The formulas for efficiency cost ... are valid regardless of the incidence of taxes in question. They depend only on three assumptions: (a) a fixed supply of capital to the economy as a whole; (b) equilibrium in the capital market, in the sense that net rates of return are equalized in all uses of capital; and (c) absence of distortions of types other than taxes on capital (or on the income from capital) in different uses. Even these assumptions can be relaxed, but only at a cost of complicating the formulas in question." (See [Harberger (1964)].)

<sup>23</sup> "A redistribution of the resources of the economy will result, moving toward a long-run equilibrium in which the net rates of return to capital are equal in both sectors. In this long-run equilibrium the wages of labor will also be equal in the two sectors, and the available quantities of labor and capital will be fully employed.

is partially shifted from corporate to noncorporate capital, until it rests proportionately on all capital.

From the standpoint of entrepreneurs, however, the tax has created an important inequality or distortion: the cost of noncorporate capital has been reduced while the cost of corporate capital has gone up until the latter exceeds the former by the amount of the tax. Now, of course, if the cost of capital goes up in the corporate sector, and down in the noncorporate, then the cost of producing corporate goods goes up and prices may be raised, and then consumers may buy less of them and more of noncorporate goods. Or the price of corporate labor might be pushed down. But then, if labor is reasonably mobile, it too may shift from the corporate to the noncorporate sector. And so on and so forth.

Just which of these things will happen, and to what extent, depends on how willing consumers are to substitute noncorporate for corporate goods, and the ability and willingness of corporate and noncorporate producers to substitute labor for capital, or vice versa, and also upon capital/labor ratios (capital intensities) in both sectors. Economists seek to quantify these matters by measuring or estimating an elasticity of substitution, which is how much substitution in fact occurs in response to any particular change in relative prices.<sup>24</sup>

### 1. Constant Expenditure Shares

Elasticities are not directly observable, and so discussion proceeds by exploring hypotheses. Harberger begins<sup>25</sup> by assuming that buyers respond to changes in relative prices (buying relatively less of the product whose

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"I also assume that the available quantities of labor and capital in the economy are not affected by the existence of the tax." Harberger (1962), *supra* n. 20, at 215-16.

<sup>24</sup> Elasticity of substitution is the ratio between changes in relative quantities bought and changes in relative price. So if the price of fish doubles relative to that of chicken and the result is that consumption of fish falls by half relative to chicken, that would represent an elasticity of substitution of -1. [????]

<sup>25</sup> [began? Etc.]

relative price goes up) by just enough to maintain a constant ratio between their expenditures. So if they bought equal quantities of X and Y when their prices were equal, and then X becomes twice as expensive as Y, buyers will purchase only half as much of X as of Y. Half as much at twice the price maintains equality of expenditures for the two products.<sup>26</sup>

For producers choosing inputs the matter is one of technology rather than taste. But there are often alternative production processes involving different input ratios, and producers seeking to minimize their costs per unit of output can be expected to respond to changes in relative prices of inputs by decreasing the use of inputs whose prices go up. Harberger begins this aspect of his investigation by assuming that corporate and noncorporate sectors each have unit elasticity of substitution between capital and labor, with the result that the ratio of expenditures on the two will remain constant in the face of changing relative prices.<sup>27,28</sup> (Returning to consumers, it is quite feasible to think of their purchases as inputs in the production of utility, and write a consumer utility function in the same form as a Cobb-Douglas production function, which would be a more elaborate way of reaching the assumption of constant expenditure shares, which Harberger made directly.<sup>29</sup>)

Harberger first shows, in English, what the effect of the corporate income tax would be in the presence of these kinds of consumption and production functions. He postulates 1,200 of total income spent: 600 for the

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<sup>26</sup> This relationship is described by saying there is a constant elasticity of substitution between X and Y of -1. (The negative sign is often omitted.)

<sup>27</sup> There is indeed a much discussed production function called Cobb-Douglas, that has this characteristic. The mathematical form of this production function is  $X = K^\alpha \cdot L^{(1-\alpha)}$ , where X is output, K and L are inputs of capital and labor, and  $\alpha$  is a parameter reflecting differences among products in labor/capital ratios.

<sup>28</sup> [Maybe Harberger's assumption was a Cobb-Douglas production function, with constant expenditure shares following. Check and rewrite accordingly if so.]

<sup>29</sup> [Methinks Shoven92 refers to Cobb-Douglas consumption functions, which might justify a simplification in the text here. Check it out.] [Is Cobb-Douglas synonymous with CES = -1, or just an instance of it?]



product of X (the corporate sector) and 600 for the product of Y, the noncorporate sector. X pays 300 each for labor and capital, and so does Y.

**Table 1: No Tax**

	X	Y	Totals
Labor	300	300	600
Capital	300	300	600
Totals	600	600	1,200

Now suppose a 50 percent tax were imposed on the earnings of capital in X, but not Y, and that the government spent the tax money half for X and half for Y. The immediate effect of this would be to halve the net return to capital in X. But then capital would flow from X to Y seeking a higher return. That would drive the return up in X and down in Y until net returns are equal, thus spreading the burden proportionately among all owners of capital.

With this shift in capital, X would produce less and Y more, but the relative price of X would go up by enough to keep expenditures equal in the two sectors, and each sector would respond to changes in the relative cost of capital and labor by keeping expenditures on them equal, and so money would continue to flow as before except that half of what would have gone to capital in sector X now goes to the government.<sup>30</sup>

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<sup>30</sup> [Deleted prior version of this paragraph? – Actually not bad.]

A tax in sector X but not Y will over time induce a flow of capital from X to Y, and also induce some increase in the relative price of X and a shift of total consumption (and production) from X to Y. But under our assumptions consumers will respond to whatever relative price changes occur by keeping expenditures equal between sectors, and each sector will respond to changes in the relative cost of capital and labor by keeping expenditures on them equal, and so money will continue to flow as before except that half of what would have gone to capital in sector X now goes to the government.]

**Table 2: Effect of Tax with Unit Elasticities of Substitution**

	X	Y	Totals
Labor	300	300	600
Capital	<b>150</b>	300	<b>450</b>
Government	<b>150</b>		<b>150</b>
Totals	600	600	1,200

This table by itself may seem to show that the tax is coming out of income to capital in sector X. But capital itself has not stayed in sector X at a lower net rate of return than in sector Y; indeed the net return of 150 in X and 300 in Y implies that the amount of capital now invested in Y must be twice that invested in X, or  $2/3$  instead of  $1/2$  of the total. One sixth of total capital has moved from X to Y.

Incidence of the tax can best be read from the totals in the right-hand column: Labor is unaffected, but owners of capital would all see their net returns reduced by 25 percent.

The economy will now be producing more of Y and less of X since sector Y has twice as much capital as X. These changes in output are offset, in the table, by an increase in price for X, together with a price decrease for Y. There have also been changes in capital/labor ratios in both sectors—decreased capital intensity in sector X with a corresponding increase in sector Y.

How are consumers affected by these price changes? An average worker, who divides his expenditures equally between X and Y, before and after the tax, would find he can buy a little less of X but more of Y. Individuals who spend more on X than on Y would indeed suffer some burden from the tax-induced change in relative prices. But others who spend more on Y than X would enjoy an equal benefit from those changes. So one has to say either (1) that consumers as a class do not bear the burden of the tax, or (2) more elaborately, that while some consumers suffer a burden from the change others enjoy a benefit of equal magnitude.

These conclusions hold even if input ratios and the division of consumer expenditures between X and Y are other than 1:1, and even different from one another.<sup>31</sup>

## 2. Fixed Input Ratios

Unit elasticity of substitution is a reasonable possibility to start from, but Harberger went on to consider others. Suppose, for example, that sector X technology were characterized by a fixed input ratio—that the elasticity of substitution between labor and capital were 0 instead of 1. Introduction of the corporate income tax would still induce investors to shift capital into the noncorporate sector. But now for every dollar removed from the corporate sector a corresponding amount of labor would have to go too. There would be no change in capital/labor ratios in either sector, and corporations would have no choice but to add the tax to the price of their product. If consumers (and government) continue to spend 600 in each sector, X would end up paying 200 in tax, 200 net to owners of capital and 200 (gross and net) to labor. Since Y still has 300 to spend for each, while X has only 200 for each, capital and labor will migrate to the noncorporate sector until it has 60 percent of each, leaving X with only 40.

**Table 3: Fixed Input Ratio in Sector X**

	X	Y	Totals
Labor	200	300	500
Capital	200	300	500
Government	200		200
Totals	600	600	1,200

The burden of the tax is now borne proportionately by labor and capital, cutting each's share of total product from 600 to 500.<sup>32</sup>

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<sup>31</sup> Moreover, "even the tax rates on the earnings of capital can be different in different taxed industries; yet the conclusion that capital bears the tax, in the sense indicated above, remains." Harberger (1962), *supra* n. 20 at 219.

<sup>32</sup> But now what if original capital/labor ratios were unequal in the two sectors. First, suppose sector X were more labor intensive. Then when labor and capital get pushed out of

But suppose it were the noncorporate sector that had a fixed input ratio, while the corporate sector enjoyed unit elasticity of substitution. Then corporations would respond to the tax by trying to use less capital and more labor in their production processes. But the noncorporate sector can only absorb capital with an inflow of labor. The flow of labor along with capital will not be because X cannot use it but because Y desperately needs it. So in both sectors there would be something of an excess of capital and shortage of labor, with the result that wages would go up relative to the return on capital. Equilibrium would only be reached in this case when the price of labor had doubled relative to the net return on capital.<sup>33</sup>

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X in a fixed ratio they would arrive in Y with too much labor in relation to capital, and the effect would be to push wages down more than the return on capital, and labor would actually bear more than a proportionate part of the burden of the tax. On some figures, much more. Harberger (1962), *supra* n. 20 at 221-22.

On the other hand, if the labor/capital ratio were higher in Y than in X, then labor would appear in Y in short supply and capital in long supply and wages would go up and returns on capital down and capital would bear more than a proportionate share; maybe the whole thing; maybe even more than that. *Id* at 222.

[Deleted text. The thought is to add a very summary allusion to this at the end of the section. The aim is to focus more clearly on the contrast between inelasticity in the two sectors.]

<sup>33</sup> [Deleted version:

#### Fixed Proportions in the Untaxed Sector

If both sectors of a two-sector model use capital and labor in the same ratios, and that ratio is fixed in one section, (and total amount of capital and labor are fixed) then the proportion is effectively fixed, by subtraction, in the other sector too. So one might expect the same results for this case as the last. But what is fixed in both sectors here is the ratio of physical labor to physical capital. Expenditures are fixed in the Cobb-Douglas sector, and so, as in the first case, labor gets 300 while capital gets only 150 net. To achieve that disproportion wages must have doubled relative to the net return on capital, and payments in sector Y must therefore go 400 to labor and 200 to capital.]

**Table 4: Fixed Input Ratio in Sector Y**

	X	Y	Totals
Labor	300	<b>400</b>	700
Capital	150	<b>200</b>	350
Government	150		150
Totals	600	600	1,200

As a result of these price changes the return to capital has gone down by more than the tax, and return to labor has gone up!

These results would be altered if the starting input ratios were different in the two sectors. In general, if the labor/capital ratio is higher in the corporate than in the noncorporate sector (as indeed it is), then any migration of capital out of the corporate sector will tend to reduce the demand for and the price paid for labor, so more of the burden of the tax would fall on labor. And vice versa.<sup>34,35</sup>

### 3. A More General Model

Unit elasticity of substitution is a plausible assumption. A fixed input ratio (elasticity of 0) is an extreme assumption, particularly for a whole large segment of the economy in which input ratios could be altered by changes in particular products produced as well as by changes in production processes. But the fixed ratio cases serve to show how differences in elasticities matter, and how they could matter greatly.

In order to reflect differences in elasticity short of fixed ratios, Harberger put all these relations into a set of differential equations for which a very

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<sup>34</sup> These would only change the magnitude of the effect when the input ratio is fixed in the noncorporate sector; when it is fixed in the corporate sector the direction as well as magnitude of the effect could be changed, on some figures quite substantially. Harberger (1962), supra n. 20 at \_\_\_\_\_.

<sup>35</sup> [Deleted prior language: Changes in capital/labor intensity in this case would cause differences in magnitude of the transfer to labor, but not in its sign.]

complicated looking general solution is also presented. This set of differential equations and its solution constitute Harberger's 1962 model.

Next, in a "detailed examination of the general solution," he "set[s] out certain general conclusions."<sup>36</sup> One of these (the next to the last) is that if the three relevant cross-elasticities were all unity, capital would bear the full burden of the tax.<sup>37</sup> This is, of course, the conclusion in the first example; it serves here to indicate that we are still on the same track.

The next and last general conclusion is that capital would bear the whole burden of the tax if the three elasticities were equal to one another, whether they were all equally high or equally low.<sup>38</sup> **Only if the elasticity of substitution between capital and labor were very low in the heavily-taxed sector would some of the burden get shifted to labor.**<sup>39</sup>

#### 4. Application to the United States Case

In 1953-55, agriculture, real estate and miscellaneous repair services paid virtually no corporate income tax, while all other industries paid 25 percent<sup>40</sup> or more. So the former is taken as the noncorporate sector, and the rest is corporate. The corporate sector, as so defined, earned a return to capital of \$40 million, which went half to the government as corporation income tax; it paid wages of \$200 million, ten times the net return to capital. The noncorporate sector contributed \$40 million, which went half to labor and half to investors. Plugging these figures into the general solution, Harberger derives a pair of formulae for the net return to capital as a

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<sup>36</sup> Harberger (1962), supra n. 20 at 227-30.

<sup>37</sup> Conclusion 9, id. at 229. [????]

<sup>38</sup> [Relate some or all of the others ??]

<sup>39</sup> Insert this here? Source? Quote?

<sup>40</sup> [percent of what? Methinks it's percent of return to capital in the industry. But how is that to be reconciled with 3 lines down where it says half of return to corporate capital went to US as CIT? Need explaining?]

function of the three elasticities. Then he proceeds to test several hypotheses about elasticities, together with what evidence he can find in the professional literature, and concludes

"that plausible alternative sets of assumptions about the relevant elasticities all yield results in which capital bears very close to 100 per cent of the tax burden."<sup>41</sup>

The analysis to this point has been on the assumption that the economy had fixed stocks of labor and capital to allocate. There now follows a brief exploration of the possibility that the tax has a substantial effect on the savings rate and therefore the general level of capital accumulation over time. Harberger

"conclude[s] from this exercise that even allowing for a rather substantial effect of the corporation income tax on the rate of saving leads to only a minor modification of my over-all conclusion that capital probably bears close to the full burden of the tax. The savings effect here considered ... surely is not sufficiently large to give support to the frequently heard allegations that large fractions of the corporation income tax burden fall on laborers or consumers or both."<sup>42</sup>

The model in the 1962 paper depicts a closed economy. Increased international trade and investment may make it much more likely that the burden of the tax gets shifted to labor in the taxing country.<sup>43</sup>

Harberger's 1962 paper was concerned solely with incidence of the corporate income tax, how its burden is distributed among categories of

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<sup>41</sup> Id. at 234.

<sup>42</sup> Id. at 236.

<sup>43</sup> [Reexamine (and cite) more recent Harberger papers to find where he makes this point.]

people.<sup>44</sup> His conclusions seem to have become the predominant assumption about incidence of the tax.<sup>45</sup> But interest has largely shifted to questions of efficiency in the allocation of resources, and the model in Harberger's 1962 paper became central for analyzing these as well. Harberger was himself a leader with respect to this shift in emphasis.<sup>46</sup> But before turning to that, we need to consider the topic of efficiency or welfare economics in a simpler setting.

### *B. Efficiency in Partial Equilibrium*

Consider a single product whose supply function is infinitely elastic—producers will supply whatever quantity buyers demand at a price representing production cost, which is the same amount per unit whatever the quantity. Demand on the other hand varies with price—the lower the price, the more buyers will buy. Equilibrium will then be reached where supply and demand functions intersect. See Figure 1, lines  $S_0$  and  $D$ . If more is produced, it will either go unsold or prices will be reduced below  $S_0$ , either of which will induce a diminution of production. If less is produced, there will be shortages or the price will edge up, either of which will stimulate increased production. If costs go down, then producers will see a profit opportunity and will produce more; but the downward sloping demand curve will force prices down until a new equilibrium is reached between demand and the new lower supply function. Etc.

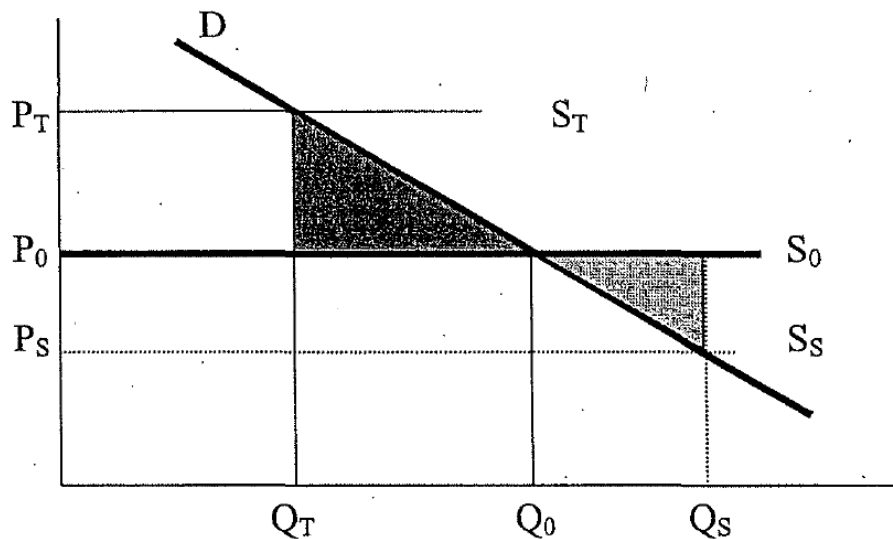
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<sup>44</sup> The paper explains efficiency effects, under the rubric of "excess burden" but only briefly, in a footnote, which then proceeds "as is customary in discussions of incidence, [to] neglect..." those effects. Id. at 219, n. 2.

<sup>45</sup> See Treasury Report at \_\_\_\_.

<sup>46</sup> See nn. H64 and 56.





**Figure 1: Partial Equilibrium**

If  $S_0$  accurately reflects total social costs of production, distribution and use of a good, and  $D$  accurately reflects total resulting benefits, then  $Q_0$  is in some sense the right (efficient) amount to produce. If any excess over  $Q_0$  is produced, its costs (represented by  $S_0$  to the right of  $Q_0$ ) will exceed its benefits ( $D$ ), and that excess represents waste. If production were less than  $Q_0$  then there would have been a wasted opportunity to produce more for which benefits would have exceeded costs. The intersection at  $Q_0$  represents a volume of production above which costs exceed benefits and below which benefits exceed costs, and toward which, therefore, the economy *should* aim.<sup>47</sup>

Now suppose a tax is imposed on production. For producers this is an increase in cost, and so the breakeven price at which they sell must be raised by the amount of the tax, as indicated by line  $S_T$ . Consumers will now buy only the reduced quantity ( $Q_T$ ) determined by the intersection between  $D$  and  $S_T$ .

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<sup>47</sup> [Explain that this means a Pareto optimum [?] without judgment about rich and poor. I.e., avoiding welfare losses, not necessarily achieving the best state of the economy in any other sense.]

But social costs of production are still represented by  $S_0$ . The interval between  $Q_0$  and  $Q_T$  represents goods not produced because of the tax, even though their value to those who would have bought them ( $D$ ) exceeds the social cost of producing them ( $S_0$ ). That excess is now represented by the area of the triangle formed by  $D$ ,  $S_0$  and  $Q_T$ . This is often referred to as a Harberger triangle.<sup>48</sup>

The base of this triangle is the distance between  $Q_0$  and  $Q_T$ —the amount by which the tax reduces production below its optimum level—and its altitude is the amount of the tax. Its area is thus one half the product of the change in quantity and the tax. Moreover, change in quantity is the amount of the tax times the price elasticity of demand. So the welfare loss is

$$\begin{aligned} WL &= \frac{1}{2}(\epsilon t)(t) \\ &= \epsilon t^2/2 \end{aligned} \tag{2}$$

The loss thus varies directly with elasticity and with the square of the rate of tax.

One can visualize these relations in Figure 1, by making  $D$  more nearly horizontal to represent an increase in elasticity or raising  $S_T$  to represent an increase in the tax. Note that if the tax is negative—a subsidy—the welfare loss is still positive since  $t$  is squared. In the diagram this is represented by setting  $S_s$  (for subsidy) below  $S_0$ , so  $Q_s$  falls to the right of  $Q_0$  and the welfare loss triangle appears below  $S_0$  and above  $D$ , and represents wasteful overproduction.

Other aspects of the diagram are of interest. In the absence of a subsidy, the area to the right of  $Q_0$  represents purchases that do not occur, with or without the tax. For them the tax has no effect. The area to the left of  $Q_T$

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<sup>48</sup> Harberger himself at least once referred to it as "the 'triangle-under-the-demand-curve' that emerges in textbook discussions of the excess burden of taxation." H64 at 71.

represents sales that continue despite the tax. The continuing purchasers in this case will bear the full burden of the tax in the form of a price increase, but that burden is offset, for society as a whole, by the presumed benefit from the government's use of the tax revenue. The space between  $Q_0$  and  $Q_T$  is one in which would-be purchasers bear the burden represented by the triangle, but the government collects no revenue since sales do not occur. The burden in this interval is accordingly sometimes called the *excess burden* of the tax, or simply *deadweight loss*.

It is easiest to think of Figure 1 as applying to a consumer good, and  $D$  as representing consumer demand, but the analysis applies equally to intermediate goods. The inefficiencies produced by the tax then result from using costlier untaxed inputs in place of less costly taxed ones, even if sales of the final product are undiminished because consumer demand for it is inelastic. The price system is supposed to induce people to find the least costly methods of production as well as the right amounts of final goods to produce, and selective excises can produce welfare losses by interfering with either function, or both.<sup>49</sup>

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<sup>49</sup> [Deleted text: this is too simple here, although it might be adapted for use in relation to the more complicated relations in Figure 2:

#### Variations and Extensions

What happens if the rate of tax depicted in Figure 1 is doubled? For this purpose, hold  $S_0$  and  $D$  constant, and raise  $S_T$ . The intersection between  $D$  and  $S_T$  will then move up and to the left along  $D$ . Doubling the tax will therefore double the behavioral change as well, and the area of the Harberger triangle will be quadrupled. [Or try to think about raising the tax just a little bit; how will the distortion be affected? The diagram indicates that the Harberger triangle will be increased by effectively adding a little sliver along its base. And so the rate at which an increase in tax will aggravate welfare losses is itself an increasing function of the tax. Students of elementary calculus can express all this more succinctly by differentiating equation (2) to yield  $WL' = \epsilon t$ .] This is the basis for the general economic efficiency case against high rates of tax.

Now suppose the tax is held constant but applied to a different product whose price elasticity of demand is twice that of widgets. That is represented by making  $D$  more nearly horizontal, and the effect will be to double the base of the triangle, but not its altitude. The excess burden will thus be doubled. On the other hand if demand for the good in question is relatively inelastic (a more steeply sloped  $D$  line) then the interval will be narrower and the

The diagram makes clear one limitation on this analysis which is often not made explicit: The demand "curve" must be a straight line to make the formula in equation (2) strictly true. In other contexts, demand curves are often drawn convex to origin, and if the hypotenuse of the Harberger triangle were so curved, the area in it would be less than that of a true triangle. The significance of this discrepancy depends on the degree of curvature of the demand curve between  $Q_0$  and  $Q_T$ , which depends in part on the relative magnitude of the tax.<sup>50</sup> For low levels of tax it is probably not unreasonable to assume that the relevant portions of demand curves are reasonably straight.<sup>51</sup> There is another enormously important limitation on this kind of analysis, which the diagram does not make clear: The whole thing depends on the market being free from distortions other than the tax in question.<sup>52</sup> A hefty gasoline tax, for example, may improve welfare if the burden of the tax is commensurate with the social costs (highway maintenance, air pollution) that are otherwise not reflected in the user's cost of automobile operation.<sup>53</sup>

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welfare loss smaller. It is therefore better, from the standpoint of economic efficiency, to lay revenue raising taxes on things for which demand is relatively inelastic.

Figure 1 shows a good for which supply is infinitely elastic, since that makes exposition easiest. But the analysis extends readily to products with sloping supply curves.]

<sup>50</sup> Suppose, for example, that a tax of five percent would wipe out 96 percent of sales of a product, while ten percent would wipe out 98 percent. The triangle computation would predict a welfare loss from the ten percent tax of twice that from the five percent tax (twice the tax and about the same behavior modification). But the rise from five percent to ten produces a miniscule behavior change, so the triangle computation obviously overestimates the loss from the larger tax.

<sup>51</sup> Shoven92 refers to this matter as the limitation to small changes, I think.

<sup>52</sup> H64; Lipsey and Lancaster. [Expand a little here, or near here, to introduce problem of 2d best more broadly. Maybe begin with other taxes, like H64.]

<sup>53</sup> [Longer version: Consider for example a gasoline tax. Proponents of such a tax argue that automobile use involves a lot of social costs, such as highway maintenance, that are not reflected in the private costs users face. Such an externality distorts the operation of the market in the direction of overuse of cars. A tax on gasoline may tend to correct this misallocation, thereby causing an increase rather than decrease in total welfare. Highway

If corporations are profit seekers, imposition of a general tax on corporate profits should have no short-run effect on corporate behavior since whatever will maximize pre-tax profits will maximize after-tax profits too. If there is no change in behavior in response to the tax, then there can be no welfare loss. But Harberger was quick to see that his incidence model provided a way to estimate substantial welfare losses in the longer run.<sup>54</sup>

### *C. Efficiency in the Harberger Model*

In 1966<sup>55</sup> Harberger published "Efficiency Effects of Taxes on Income from Capital."<sup>56</sup> He begins this paper distinguishing between incidence and efficiency effects by reference to the model in the 1962 paper. The burden of the tax would fall completely on capital, he recalls, if the three major elasticities were equal to one another, whether they are equally high or equally low.<sup>57</sup> "Thus, regardless of whether the three elasticities

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maintenance is perhaps the most obvious such cost, but the argument applies equally to any social cost of the activity in question, like air pollution, which is not included in individual users' private costs. Or anything at all that might create a bias in favor of the activity in question, like the presence already of taxes on other activities or products. Indeed if there were a tax in place on all products other than widgets then the imposition of a similar tax on widgets would be expected to improve allocation of resources. H64. The problems of identifying and measuring such existing distortions and designing taxes that will serve to reduce rather than aggravate them are beyond the scope of any single-product diagram, like the one in Figure 1, to illumine. [But see H64 for a discussion of the extent to and methods by which practical estimates of such things can be made.]

<sup>54</sup> See n. 56 below.

<sup>55</sup> [In view of the extent of the two prior sections, this one perhaps ought to be able to be made briefer—just pulling together the ideas in them. Like H66 itself. Be that as it may, the order here needs careful examination. Some early text is written in terms of Figure 2 which is located several pages later, with other explanatory text there. Work out relations to figure and equation.]

<sup>56</sup> Harberger, Arnold C., "Efficiency effects of taxes on income from capital," *Effects of the Corporation Tax*, Marian Krzyzaniak editor. Detroit: Wayne State University Press (1966).

<sup>57</sup> *Supra* p. 18.

of substitution in question are all equal to -1, or all equal to -4, or all equal to -1/4, the answer to the incidence problem will be the same. However, the efficiency costs of the tax in question will vary greatly, according as the elasticities of substitution are large or small.”<sup>58</sup>

In the absence of tax or other distortions, capital (and labor) will be allocated between corporate and noncorporate sectors in a way that produces equal risk-adjusted rates of return; which implies an efficient allocation of capital between sectors. If capital became more productive in either sector—because of changes in production technology or consumer demand or labor supply or whatever—then its return in that sector would go up and capital would be attracted into that sector to earn the higher return, and vice versa. And the result would be to encourage capital to flow, continuously toward its most productive emerging uses, which is to say, toward maximum efficiency in meeting whatever economic goals market demands reflect.

If a tax is imposed on capital income, in the corporate sector only, investors will divert investment funds out of the corporate sector until after-tax rates of return are equalized. That diversion will involve various adjustments in consumption and methods of production that will shift the burden of the tax, as described above.<sup>59</sup> But in addition to shifting the burden of the tax these adjustments all represent departures from the most efficient allocation of resources by some combination of underproduction of corporate goods and alteration of capital/labor ratios within each sector. The form of the inefficiency will depend, like incidence, on various elasticities of substitution and capital intensities in various segments of the economy.

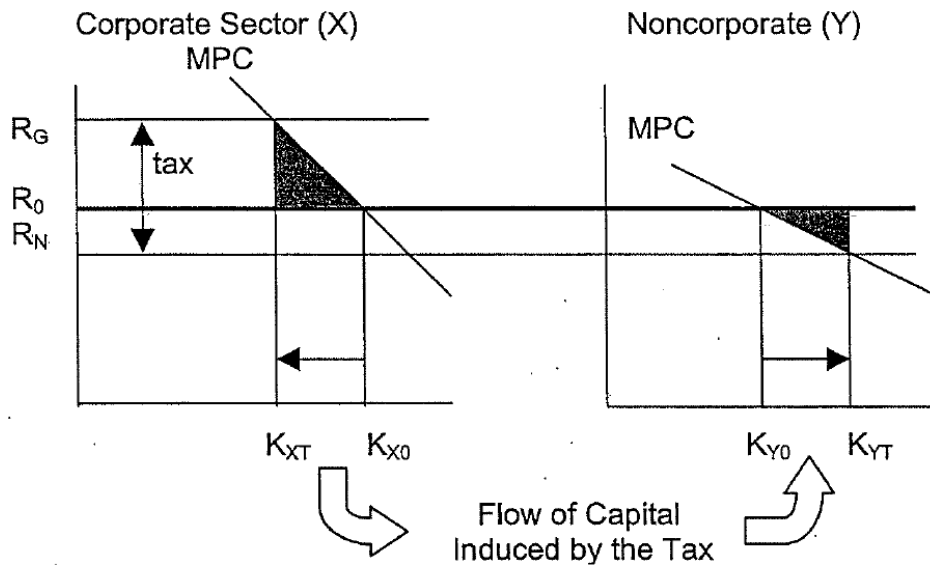
But the magnitude of the overall efficiency loss can be readily specified without regard to these particulars. The inefficiency can be measured, in effect, at the capital investment stage itself. All we need to know is (1) how much capital is driven out of the corporate sector by the tax, and (2) how much less productive that displaced capital is as a result.

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<sup>58</sup> Id. at 107-08.

<sup>59</sup> Part II.A beginning at p. 9.

The matter is commonly represented by a linked pair of supply and demand graphs for the corporate and noncorporate sectors like that in Figure 2. The vertical axis in this case is rate of return (price of capital), and  $R_0$  represents an initial equilibrium before imposition of tax. When a tax is imposed in the corporate sector it causes the net return ( $R_N$ ) to capital in the corporate sector to be less than the gross return ( $R_G$ ) by the amount of the tax. But investors will respond to net returns, moving capital out of the corporate sector until a new equilibrium is reached in which net returns in the two sectors are equal. The amount of capital leaving one sector ( $K_{X0} - K_{XT}$  in the corporate graph) just equals that going into the other ( $K_{YT} - K_{Y0}$  in the noncorporate graph).<sup>60</sup>



**Figure 2: General Equilibrium between Corporate and Noncorporate Sectors**

There are also two shaded triangles representing welfare losses, one from under-investment in the corporate sector and the other from over-investment in the noncorporate sector. The base of each triangle is the amount of capital deflected; their altitudes are the increase in cost of capital in the corporate

<sup>60</sup> This link derives from an explicit assumption that total capital is fixed. Id. at 109.

sector ( $R_G - R_0$ ) and the decrease in the noncorporate sector ( $R_0 - R_N$ ). The sum of the altitudes is the amount of the corporate tax ( $R_G - R_N$ ), and so the total welfare loss is half the rate of the tax times the amount of capital deflected.<sup>61</sup>

$$\begin{aligned} WL &= \frac{1}{2}(\epsilon t)(t) \\ &= \epsilon t^2/2 \end{aligned} \tag{3}$$

This is formally identical to equation (2) in the partial equilibrium case, though it now represents the more complicated story depicted in Figure 2.<sup>62</sup>

Harberger turns next to some data about capital income and taxes thereon for the United States in the '50s. For this purpose his noncorporate sector consists of Agriculture, Housing, and Crude Oil and Gas, even though some Agriculture and Housing and most Crude Oil and Gas are produced by corporations.<sup>63</sup>

In a simple model,  $t$  is simply the rate of tax in the taxed sector. In the real world, it is the difference in total tax burden on capital income between the corporate and noncorporate sectors. This is the corporate income tax rate minus some adjustment for the lower effective rate of individual income tax on corporate income than on other income.

[In H66 it is simply the excess tax burden in the high tax sector over that prevailing in the low tax sector. He adds up total income and property taxes

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<sup>61</sup> [Is sigma or epsilon the more appropriate symbol for cross elasticity of demand for corporate and noncorporate capital? It's sort of the converse of substitution.]

<sup>62</sup> Cf.  $E = m \cdot c^2$  for a formally similar description of havoc in another sphere.

<sup>63</sup> "The terms 'Corporate' sector and 'Non-Corporate' sector are really misnomers: it might perhaps be better to call them the 'Heavy-Tax' sector and the 'Light-Tax' sector." H66 at 111.



for each sector (including an imputation of individual income taxes), and then states the high tax as a surtax on top of the average rate prevailing in low-tax sector.]

Cross-elasticity of demand for corporate and noncorporate capital is harder. Elasticities are a matter of estimation rather than observation. Cross-elasticity is essentially a matter of substitution: How good a substitute is noncorporate capital for corporate capital? It might be a substitute because consumers will accept noncorporate products instead of corporate products, as price ratios change, or because noncorporate producers can substitute capital for labor while corporate producers make a compensating substitution of labor for capital. It thus depends on all the possible smaller adjustments that make up the grist of a Harberger-type general equilibrium model, and so it is that such a model is the primary thing used in the Treasury Report, and elsewhere, to estimate the welfare losses due to the tax.<sup>64</sup>

#### *D. Financial Adjustments*

Harberger general equilibrium analysis began as an evaluation of the effects of subjecting corporate income to the additional burden of the corporate income tax. Individual taxes were ignored, presumably on the assumption that they applied to corporate and noncorporate income alike.<sup>65</sup>

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<sup>64</sup> [This sounds nice if read fast, but what does it mean? What does H66 do for an elasticity figure? (For a first rough cut it just assumes -1 or -.5. Then it resorts to more math to derive it from  $V$ ,  $S_X$  and  $S_Y$ , the three elasticities of substitution—consumer elasticity between X and Y, and capital labor elasticity within each sector—making a variety of assumptions with respect to each of them.) I think UST derives it in effect from estimates of elasticities in subsectors together with data from actual statistics. Is it accurate to say that the whole complicated apparatus of the CGE model is solely concerned with arriving at that figure, so far as estimates of Welfare Loss are concerned? But is that figure as estimated ever given? Why not?]

<sup>65</sup> [Find out the Shoven correction. Look at H66 adjustments and consider describing them. Review how H treated debt in H62. In H66 it is by taking figures for corporate income taxes paid rather than the corporate tax rate as the basis for estimating the additional burden; if that was so from the beginning then adjustments for debt may be a nonissue.

## 1. Debt

The total cost of corporate capital is a blend of the cost of equity capital, which includes the burden of the corporate income tax, and the cost of debt capital, which does not. Accordingly, multi-sector CGE models have long contained parameters reflecting observed average debt/equity ratios for each sector in the model, and have computed the cost of capital accordingly. So if airlines, for example, exhibit an average debt/equity ratio of 3:1, then the cost of capital in the airline sector would be a blend of 3 parts  $r$  and 1 part  $r/(1 - c)$ . (For small values of  $c$  this is somewhat like cutting the corporate income tax rate by 75 percent and applying it to all corporate capital.)<sup>66,67</sup> This reflection of the effect of debt finance has been a common feature of CGE models for some time.

This basic treatment of debt in CGE models (illustrated in the Treasury Report by the Augmented Harberger Model without Financial Distortions) takes debt/equity ratios as given and fixed within each industrial sector; it thus fails to reflect the fact that those ratios may be in part a result of the very tax system under investigation. More concretely, in comparing operation with and without a corporate income tax, or under various

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[But methinks Shoven describes use of the corporate tax rate with observed debt ratios as an improvement over H's use of taxes paid. I think he describes it as the advantage of using marginal rather than average tax rates.]

<sup>66</sup> [Does this equal  $r/(1 - c/4)$ ? NO. [Probably only approximately. Where  $c$  is 1/3 I think the outcome happens to be  $r/(1 - c/3)$ . Is it generally  $1/(d/e)$ ? I doubt it.] [Latest thought 10/2: it probably does come out the same provided you are averaging by reference to fractions of capital, and that previous concerns reflected an averaging by reference to something that was not uniform, like pretax income which is forced by the tax to be higher for the equity portion than the debt portion. If this insight checks out, a considerable number of lines around here can be joyfully eliminated.]

<sup>67</sup> Is it correct that  $r$  is taken as a single figure for both debt and equity? A: yes, at the beginning of its description of simulations [?] TR takes a 4 percent after-tax real rate of return as what investors demand. That provides the base for computing cost of capital, in each of its forms, as a specific percentage figure.

[Is it possible to come up with an example out of Shoven for which he supplies the figures?]

integration prototypes, this model fails to reflect the fact that debt/equity ratios are likely to be different in these various states. Taking debt/equity as a fixed parameter within each sector thus fails to reflect the *bias* of the tax system in favor of debt over equity.<sup>68</sup>

In behavioral terms, this treatment of debt is as if a corporation considering an investment figures out its cost of capital by looking at what debt/equity ratios are, on average, within its industrial segment, and assuming its new investment will be financed that way. Stated a little differently, the implicit assumption is that the Vice-President for Finance will seek with respect to any new investment to increase corporate debt by a percentage of the cost determined by looking at the existing debt/equity ratios of other corporations in his sector.

## 2. Accumulation of Earnings

[Herein of early H episode concerning nonpayment of dividends; Shoven correction? How it was handled in H66.

[This exposition should be kept relatively simple; just correcting the initial misimpression that CIT itself represents the extra burden.

[Following is copied from its place in Part III.B.1. It needs to be edited for inclusion here and then Part III edited accordingly.

Corporate income distributed as dividends is taxed forthwith, in full, at ordinary income rates; accumulated income is not. The increase in share value that results from accumulating corporate earnings may be subject to individual income tax, but the burden of that tax is almost always much less.

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<sup>68</sup> Of course the cost of capital in high debt/equity sectors will be lower than in low debt/equity sectors, and according to the general equilibrium paradigm that will cause more capital to flow into the former and less into the latter, and if ratios were fixed for each sector that diversion of funds from the latter to the former would produce some increase in overall debt/equity ratios. What the Augmented Harberger Model without Financial Distortions does not reflect is the distorting effect of the tax on debt/equity ratios within each sector.

The most obvious tax advantage for income in the form of share appreciation, throughout most of the history of the income tax, has been the bargain rate of tax on long-term capital gains—generally less than half the rate applied to dividends and other ordinary income.<sup>69</sup>

But the tax burden on capital appreciation is way below the nominal rate, in any case, by reason of the deferral of tax on capital appreciation until a shareholder disposes of his shares. "A common rule of thumb," says the Report, "is that the accrual-equivalent tax rate on capital gains is about one-fourth the statutory rate."<sup>70</sup> The accrual-equivalent tax (AET) rate is the rate at which a tax imposed on unrealized appreciation annually as it accrues would be equivalent in burden to the taxes that are in fact later imposed upon realization and recognition of such appreciation. This concept obviously involves an estimate of an average—not a precise computation of anything and not even an estimate of the burden in any particular case, since periods of deferral as well as other factors will differ from one taxpayer to another.<sup>71</sup> For some substantial portion of individual gains,<sup>72</sup> § 1014 produces an out-right exemption—which is an effective individual tax rate of zero.<sup>73</sup> One consequence of the low AET rate on unrealized appreciation

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<sup>69</sup> § 1(h). The capital gain rate differential was eliminated in 1986 when the top rate was set at 28 percent for both capital gains and ordinary income. But some differential reemerged quite soon as budget deficits led to reinstatement of ordinary income rates above 28 percent, and in 199x a full blown capital gain preference was reinstated when the top rate for most capital gains was set at 20 percent.

<sup>70</sup> Treasury Report c. 13, n. 10, citing Poterba, "Tax policy and corporate saving" (1987) and references cited therein. The Treasury Report goes on to say "This adjustment captures reductions attributable to deferral and to the fact that the basis of inherited property is stepped up to fair market value (eliminating the tax on capital gains accrued before the holder's death)." Ibid.

<sup>71</sup> Even in a particular case, the AET is not fixed upon investment, since the actual persistence of deferral will depend upon subsequent decisions about continuation or termination of the investment.

<sup>72</sup> Assumed in the Treasury Report to be two-thirds. Treasury Report c. 13, n. 39.

<sup>73</sup> [Moreover, the AET concept does not capture the fact that the extent of deferral, and the likelihood of exemption via § 1014, are themselves influenced by the tax.] delete?

due to corporate accumulations, is to reduce the cost of corporate capital below what it would be if all corporate earnings were paid out as dividends. This reduction offsets to some degree the extra burden of the corporate income tax.

This point was made, indeed, in a prepublication comment on Harberger's 1962 paper; Harberger responded with an addendum in the published version, indicating that his general conclusions would still hold even if the additional burden of the corporate income tax were reduced by the difference between ordinary income and capital gain rates on total corporate income. The addendum suggests that this is a generous correction since obviously a substantial part of corporate income is distributed as dividends and thus taxed in full at ordinary individual income rates. Today it is widely understood that Harberger's adjustment is insufficient in another respect—in relation to the income that is not distributed—because deferral pushes the effective rate of tax on capital gains far below the statutory rate.

General equilibrium models today, including those in the Treasury Report, all adjust for individual income taxes in essentially the way suggested by Harberger's addendum, but with extensive refinements. If a corporation does not pay dividends, its earnings are not subject to immediate individual income taxation, as they would be if distributed as dividends or if the earnings accrued directly to shareholders without the intervention of a corporation. Accordingly, the cost of equity capital raised by the issue of nondividend-paying shares, as augmented by the corporate income tax, is diminished by this reduction in individual tax.<sup>74</sup> If a corporation pays out some but not all its earnings as dividends, then its equity capital is regarded as partly dividend-paying and partly nondividend-paying, in the same ratio as the prevailing dividend payout ratio. Prevailing payout ratio is commonly taken as the average payout ratio prevailing in the sector of the economy within which the corporation operates.<sup>75</sup>

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<sup>74</sup> [Simplify and prune.]

<sup>75</sup> This seems to imply an assumption that a corporation operates under some unspecified pressure to conform its payout ratio to an industry average. Nothing is cited to explain the source of this pressure or to indicate whether in fact corporations in particular

These matters are put in formulae as follows:

The cost of dividend-paying equity, as indicated above, is  $r/(1 - c)$ , where  $c$  is the rate of corporate income tax and  $r$  is the rate of return demanded by investors.<sup>76</sup> The rate specified by  $r$  is the pretax rate for a fully taxable return, at the individual level.

The cost of nondividend-paying equity is then also specified as  $r/(1 - c)$ , but reduced by a factor expressing the difference between full, current, dividend taxation, and deferred capital gain taxation. This factor is  $(1 - m)/(1 - z)$ , where  $m$  is the rate of tax on dividends and  $z$  is the AET rate on capital appreciation. The cost of nondividend-paying equity is thus

$$\frac{r(1 - m)}{(1 - c)(1 - z)} \quad (4)$$

For a shareholder who confidently expects to hold her shares until death,  $z$  will be close to zero and the cost of nondividend-paying equity approaches

$$\frac{r(1 - m)}{(1 - c)} \quad (5)$$

So for such a shareholder whose tax rate is the same as the corporate rate, the corporate cost of nondividend-paying equity capital is  $r$ , the pretax interest rate. And if the individual marginal rate is higher than the corporate rate, the cost of nondividend-paying corporate capital will actually be something less.

These adjustments are all aimed simply at getting an accurate measure of the extra tax burden on capital income in the corporate sector. They are

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industries exhibit similar payout ratios, or, if they do, to explore possible alternative explanations for such similarities.

<sup>76</sup> See formula (1) on page 8 above.

looking for something equivalent to a reduction in the corporate income tax rate to reflect tax advantages many of which arise from the individual income tax treatment of corporate income. Payout and debt ratios are specified as fixed parameters for each sector, and the fact that they might vary because of the tax features under investigation is ignored.

The Treasury Report goes further than most<sup>77</sup> prior general equilibrium models by seeking to take into account how the tax system affects debt/equity and dividend payout ratios. This extension of the analysis is taken up in Part III—Financial Distortions, beginning at page 39 below.

#### *E. Augmentation of the Harberger Model*

A lot of subsequent work has expanded in various directions on Harberger's original idea. In particular, subsequent versions of the model have had more than two sectors, representing different industries with different production functions. Also, consumers have been divided into categories, with variations in utility functions. Expanded models have been equipped with production functions that are more easily computable for multiple sectors than those in the original Harberger model, and have come to be called Computable General Equilibrium models,<sup>78</sup> and they are at the heart of the Treasury Report's economic analysis. Indeed the primary model in the Report is referred to as the Augmented Harberger Model.<sup>79</sup>

[Make clear:

multiple sectors are in large measure for the purpose of arriving at  $\epsilon$

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<sup>77</sup> [many?]

<sup>78</sup> Shoven85.

<sup>79</sup> "While the original Harberger model had only two sectors, the augmented model embodies a richer depiction of the economy. It has 18 industries and 35 different types of assets, and includes both intermediate and final goods. In the original model, the total supplies of capital and labor were fixed. In the augmented model, the supplies of labor and capital can vary depending on their rates of return, but in the simulations the supply of capital is held constant. Investment decisions are based on the cost of capital described in the preceding section." TR13 tan 48.

they also produce different  $t$ 's, due to different debt/equity and payout ratios

they facilitate use of prior estimates for particular industries

describe nested production functions(?)]

#### *F. The Mutual Production Model*

One assumption implicit in Harberger's model, and many other early CGE models, is that particular goods are produced either in the corporate sector or in the noncorporate sector, but not in both.<sup>80</sup> There are products, however, that are in fact produced in both sectors, and the second model used in the Treasury Report, called the Mutual Production Model,<sup>81</sup> follows recent innovations to take account of this fact. Distortion of the choice between corporate and noncorporate production of the same good will not show up in overproduction of one good as compared to another, but perhaps, instead, in production inefficiencies. The Treasury Report says

Costs associated with this additional margin of distortion arise when corporate and noncorporate producers within an industry have different advantages, for example, greater ability to exploit scale economies by corporations or greater entrepreneurial skill in noncorporate organizations.<sup>3</sup>

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<sup>3</sup> Whether these distortions in fact create significant efficiency costs depends on the response of business enterprises to the tax bias against incorporation. Gordon and MacKie-Mason (1991), analyzing data on individual business enterprises, find that changes in organizational form (between C and S corporations, and between S corporations, partnerships, and proprietorships)

<sup>80</sup> [Funny way to put it. H66 makes it perfectly clear that corp/noncorp is a misnomer; what it really is is high-tax low-tax; sometime called corp because CIT is such an important factor in generating the difference.]

<sup>81</sup> See TR13 tan 51.



are sensitive to changes in tax rates and other tax policy incentives. [Treasury Report c. 13, tan 3.]

It is further assumed, apparently, that each of these production advantages becomes relatively more valuable as more production goes into the other sector—value rises with scarcity, as is generally assumed with respect to goods.<sup>82</sup> This explains why there continues to be some corporate and some noncorporate production. Moreover, it indicates that there would be some corporate production and some noncorporate production in the absence of corporate income tax, and the balance would then represent an optimal mix. The effect of the corporate income tax will then be to alter the mix of corporate and noncorporate production in an inefficient manner. The magnitude of this production inefficiency could then be computed by the same technique as that used to compute allocation inefficiencies in the choice between corporate and noncorporate products: Find (or make) an estimate of the extent to which production switches from corporate to noncorporate because of the corporate income tax, and the deadweight loss then equals the product of that change and the tax itself. Since the change will be the amount of the tax times the cross-elasticity of demand for the two production methods, the deadweight loss will again be proportional to the square of the amount of the tax.<sup>83</sup>

In fact the Treasury Report shows no separate figures for loss due to this factor. Rather, the MPM simply comes up with a considerably higher estimate of elasticity of substitution between corporate and noncorporate capital, and so more capital shifts between corporate and noncorporate sectors in response to any particular rate of tax differential. Total welfare gains from better resource allocation therefore take much larger values, for

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<sup>82</sup> And is explicitly assumed as to factors of production like labor and capital in so-called Constant Elasticity of Substitution (CES) production functions.

<sup>83</sup> Shoven85 8[?].

each integration prototype, than under the Augmented Harberger Model.<sup>84,85,86</sup>

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<sup>84</sup> Compare Table 13.8 for the MPM with Table 13.6 for the AHM. Gains from improved resource allocation are over twice as much for the former. Gains (and a few losses) from financial distortions bring the differential for total welfare gains to something less.

<sup>85</sup> Here are a few of the principal recent pieces cited in the Treasury Report as bearing on the use of computable general equilibrium models to estimate dead weight losses produced by the corporate income tax, and gains to be achieved by integration:

Shoven & Whalley (1972) "A general equilibrium calculation of the effects of differential taxation of income from capital in the U.S.," *Journal of Political Economy*, Vol. 94 (June 1971). p. 281;

Shoven (1976), "The incidence and efficiency effects of taxes on income from capital," *Journal of Political Economy*, Vol. 84 (December 1976). p. 1261;

Ballard, Fullerton, Shoven & Whalley, A General Equilibrium Model for Tax Policy Evaluation. Chicago: University of Chicago Press (1985);

Fullerton, Don and Yolanda Henderson, "A disaggregate equilibrium model of tax distortions among assets, sectors and industries," *International Economic Review*, Vol. 30 (May 1989). p. 391;

Fullerton, Henderson & Mackie, "Investment allocation and growth under the Tax Reform Act of 1986," Compendium of Tax Research 1987. Washington: U.S. Govt. Print. Off. (1987);

Gordon & MacKie-Mason, "Taxes and the choice of organizational form," Working Paper No. 3781. Cambridge: National Bureau of Economic Research (July 1991);

Gravelle & Kotlikoff, "The incidence and efficiency costs of corporate taxation when corporate and noncorporate firms produce the same good," *Journal of Political Economy*, Vol. 97 (Aug. 1989);

Gravelle, Jane G., *Corporate Tax Integration: Issues and Options*, Congressional Research Service, Washington, D.C. (1991).

<sup>86</sup> [Query whether this Part II should have a description of the problem of second best? Or save it for later?]

*G. Treasury's Findings*

[Set forth here a summary of findings for Augmented Harberger and MPM without Financial Distortions.]

**III. Financial Distortions**

[In addition to depressing corporate investment the corporate tax system is commonly thought to distort corporate financial practices by favoring debt over equity investment and by discouraging payment of dividends. So it is commonly thought that integration would relieve these distortions as well as the bias against corporate investment.]

[Prior economic analysis of these is largely separate and quite different from that described in Part II. It is not primarily welfare evaluation, but rather an effort to understand why corporate financial behavior is as it is. The Treasury Report, in order to give a full evaluation of integration quite properly seeks to combine the economics concerning financial effect with that concerning investment.]

[The combination and interaction in the TR is itself quite complex and includes these elements.]

[1. Because of the more favorable tax treatment of debt than equity and of accumulations than of dividends, the extra tax burden on corporate income is less than the burden of the corporate income tax itself. This has been noted in Part II.D above on Financial Adjustments.]

[2. But this does not reflect the fact that financial behavior is distorted by the tax and will be altered by integration. So the models in the TR make financial behavior endogenous; estimate changes in financial behavior that will result from various forms of integration, and incorporate these into their estimates of investment effects. {Presumably the result is some decrease, since reduction in debt and increase in dividends will both operate to increase taxes in the corporate sector.}]

[3. But elimination of financial distortions is asserted to have its own welfare gains. So these are estimated in a manner similar to that for gains

with respect to resource allocation, and added to the latter for each integration prototype.]

Harberger general equilibrium models have generally to do with differences in rates of tax on capital income in different sectors of the economy. But the corporate income tax system is not a simple additional tax on capital income. For one thing, by reason of the corporate interest deduction, it does not apply to the return on debt capital. For another, the individual income tax does not apply to corporate income as such, but only to corporate distributions and gains on the disposition of shares.

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Brief discussion of prior literature on taxation and corporate finance?

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In addition to the bias against corporate investment, two other important biases are created by the present system of taxing corporate income. They both have to do with corporate finance: One is a bias against corporate equity finance as compared with debt; the other is an asserted bias against the payment of dividends. The initial description of these in the Treasury Report is comparatively simple; the way they enter into the models and estimates is not.

The bias in favor of debt over equity finance results from the deduction that is allowed for interest on debt but not for dividends on equity. The effect of that deduction is essentially to remove the burden of the corporate income tax to the extent that corporate investment is financed with debt instead of equity.

The bias against payment of dividends, according to the Report, has nothing to do with the corporate income tax, which is payable on corporate earnings whether distributed or not. The bias results solely from the fact that dividend income is subject to immediate ordinary income tax in the hands of shareholders while the appreciation in share value that results from accumulating earnings is not. The much lower effective rate of individual tax on accumulated earnings creates a bias against the payment of dividends

and also ameliorates the disincentive to corporate investment created by the corporate income tax.

These two biases enter into the Treasury analysis in several distinct ways. First, both are taken into account as reducing the cost of capital below that for dividend-paying corporate equity, thus reducing the overall cost of corporate capital and the misallocation of resources resulting from it as described in Part II. This effect was pointed out in early responses to the original Harberger analysis,<sup>87</sup> and has been taken into account in most subsequent CGE models by observing debt-equity and dividend-payout ratios in the various sectors modeled and recomputing the cost of corporate capital accordingly. The Augmented Harberger Model without Financial Distortions in the Treasury Report is representative of CGE models that have only this reflection of the lower rate of tax on debt and accumulated equity.

But such an adjustment, taking debt/equity and dividend payout ratios as fixed and given within each industrial sector, fails to reflect the fact that the tax system is (or may be) biased with respect to the choices reflected in those very ratios—biased in favor of higher debt/equity ratios and lower dividend-payout ratios.

The principal simulations in the Treasury Report seek to remedy this failure by making debt/equity and dividend-payout ratios into endogenous variables which are affected by the taxes under investigation. The models incorporating this extension are Augmented Harberger CGE without Financial Distortions, and MPM.

The Treasury's incorporation of financial biases has two aspects. First, since integration generally reduces those biases, it should cause a reduction in debt/equity ratios and an increase in dividend payout ratios.<sup>88</sup> In estimating post-integration distortions in the allocation of real resources

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<sup>87</sup> See discussion at p. 50 below.

<sup>88</sup> But see p. 47 below.

among sectors, the Treasury uses those altered financial ratios.<sup>89</sup> Second, the Treasury Report asserts, there is a welfare gain from elimination or reduction of the financial biases themselves. Corporations and investors will come closer to optimal<sup>90</sup> debt/equity and payout ratios after integration than before, and this produces a welfare gain in itself, apart from those resulting from increased corporate investment. So the Treasury Report adds those gains to the ones resulting from improved allocation of real resources among sectors.

#### A. *The Corporate Interest Deduction*

If a corporation raises capital by borrowing instead of selling shares, the return it pays on the borrowed capital will be interest, which is deductible in computing corporate taxable income. As a result of that deduction, corporate operating income distributed to creditors as interest on debt is not subject to corporate income taxation, and so the bias against corporate investment described in Part I is *pro tanto* eliminated. Or, in terms of cost of capital, the cost of debt capital is just  $r$ , the return demanded by investors, unincreased by the corporate income tax. This has two important consequences. First, it means that the bias of the corporate income tax against corporate investment will be ameliorated to the extent that corporations utilize debt instead of equity finance. But second, it also means the amount of debt utilized by corporations will be more than it would be in the absence of the tax. These two differences are each reflected in the Treasury Report.

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<sup>89</sup> [Check with care. Amelioration of the financial bias should result in some aggravation of the investment bias. I.e., reduction of debt/equity ratio and increase in dividends mean increase in effective tax rate—reduction of reduction due to integration. So models with financial distortions should exhibit smaller gains from resource allocation. Do they?]

[If so, this point should go in text. Effect is reduced improvement in resource allocation, but offset by intrinsic value of improved financial ratios!?!]

<sup>90</sup> [Meaning optimal in absence of taxes; the word should be so defined at some earlier point. More particularly it should be introduced in II.B Efficiency in Partial Equilibrium beginning on page 20.]

## 1. Cost of Capital

The total cost of corporate capital is a blend of the cost of equity capital, which includes the burden of the corporate income tax, and the cost of debt capital, which does not. Accordingly, multi-sector CGE models have long contained parameters reflecting observed average debt/equity ratios for each sector in the model, and have computed the cost of capital accordingly. So if airlines, for example, exhibit an average debt/equity ratio of 3:1, then the cost of capital in the airline sector would be a blend of 3 parts  $r$  and 1 part  $r/(1 - c)$ . (For small values of  $c$  this is somewhat like cutting the corporate income tax rate by 75 percent and applying it to all corporate capital.)<sup>91,92</sup> This reflection of the effect of debt finance has been a common feature of CGE models for some time.

This basic treatment of debt in CGE models (illustrated in the Treasury Report by the Augmented Harberger Model without Financial Distortions) takes debt/equity ratios as given and fixed within each industrial sector; it thus fails to reflect the fact that those ratios may be in part a result of the very tax system under investigation. More concretely, in comparing operation with and without a corporate income tax, or under various integration prototypes, this model fails to reflect the fact that debt/equity ratios are likely to be different in these various states. Taking debt/equity as a fixed parameter within each sector thus fails to reflect the *bias* of the tax system in favor of debt over equity.<sup>93</sup>

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<sup>91</sup> [Does this equal  $r/(1 - c/4)$ ? NO. [Probably only approximately. Where  $c$  is 1/3 I think the outcome happens to be  $r/(1 - c/3)$ . Is it generally  $1/(d/e)$ ? I doubt it.]]

<sup>92</sup> [Is it correct that  $r$  is taken as a single figure for both debt and equity? Is it possible to come up with an example out of Shoven for which he supplies the figures?]

<sup>93</sup> Of course the cost of capital in high debt/equity sectors will be lower than in low debt/equity sectors, and according to the general equilibrium paradigm that will cause more capital to flow into the former and less into the latter, and if ratios were fixed for each sector that diversion of funds from the latter to the former would produce some increase in overall debt/equity ratios. What the Augmented Harberger Model without Financial Distortions does not reflect is the distorting effect of the tax on debt/equity ratios within each sector.

In behavioral terms, this treatment of debt is as if a corporation considering an investment figures out its cost of capital by looking at what debt/equity ratios are, on average, within its industrial segment, and assuming its new investment will be financed that way. Stated a little differently, the implicit assumption is that the Vice-President for Finance will seek with respect to any new investment to increase corporate debt by a percentage of the cost determined by looking at the existing debt/equity ratios of other corporations in his sector.

## 2. Reflecting the Bias

In order to reflect the bias, the full Augmented Harberger Model contains within it a submodel for determining debt ratios as a function of each income tax system. There is a considerable discussion in the report of nontax advantages and disadvantages from the use of debt in place of equity finance.<sup>94</sup> The chief disadvantages arise from the increased risk of insolvency produced by higher debt ratios. The asserted advantages include better monitoring of corporate managers through the discipline of having to make debt repayments when due.<sup>95</sup> Further, it is assumed that there is an optimal ratio below which advantages of an additional increment of debt outweigh disadvantages and above which disadvantages predominate. The model incorporates an estimate that this optimal ratio averages 30 percent throughout the corporate sector.

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<sup>94</sup> "Central to the argument that the tax bias against equity finance distorts corporate financing decisions is the existence of nontax costs and benefits associated with corporate debt financing. If nontax costs of debt are significant, losses in economic efficiency can accompany the greater debt levels resulting from the tax bias against equity finance." Treasury Report c. 13, 13.

<sup>95</sup> "As corporate borrowing remained high during the 1980s, many nontax arguments for high debt financing appeared. Analysts most sanguine about the rise in debt financing typically maintain that debt is desirable because it gives suppliers of capital an indirect means to monitor the activities of managers. Their reasoning is that the need for supervision results from the separation between ownership and management that is characteristic of the traditional corporate structure. A conflict between ownership and management can emerge if it is difficult for suppliers of capital to observe and evaluate the activities of entrenched managers. In this kind of environment, management's self-interest may not always coincide with efficiently operating the business enterprise—with maximizing value." *Id.*



Observed debt/asset ratios average 36.6 percent. That means the tax system has pushed behavior 6.6 percentage points away from the optimal point thus inducing people to incur debt even when the nontax disadvantages outweigh advantages. That difference is the product of the tax bias in favor of debt times the elasticity of debt with respect to that bias.<sup>96</sup>

I would have thought the bias against equity as compared with debt would be specified the same way as the primary bias against corporate equity-financed investment as compared with noncorporate investment.<sup>97</sup> But the Treasury Report actually pursues a somewhat more complicated route. As explained in a note:

The analysis of corporate borrowing in the model is based on Nadeau (1988).<sup>98</sup> He estimates an elasticity of the fraction of total external financing in the form of debt to the difference between the real rate of return required on equity and the real interest rate of 0.224. The representation of corporate borrowing in the model is consistent with an elasticity of the debt to asset ratio with respect to the tax advantage of debt of 0.3. Nadeau measures the tax advantage of debt as

$$1 - (1 - tc)(1 - te)/(1 - td)$$

where  $td$  is the tax rate on debtholders,  $tc$  is the corporate tax rate, and  $te$  is the effective tax rate on the real return to equity (including the benefit from the preferential treatment of capital

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<sup>96</sup> In constructing the model the reasoning probably goes in the opposite direction—the estimate of an undistorted optimal debt ratio is derived from observed ratios minus estimates of the degree to which they are distorted, and the degree to which they are distorted depends on estimates of elasticity made in view of various results of several empirical investigations.

<sup>97</sup> Formula (1) on page 8 above.

<sup>98</sup> Nadeau, Serge, "A model to measure the effects of taxes on the real and financial decisions of the firm," *National Tax Journal*, Vol. 41 (December 1988). p. 467.

gains). Rangazas and Abdullah (1987) have estimated that this elasticity is about 0.4 in the long run, somewhat larger than the behavioral response assumed in the model used in this Report. [Treasury Report c. 13, n. 41.]<sup>99</sup>

One interesting thing about this specification is that it will show a bias in favor of debt over equity even with no corporate income tax at all, if the tax rate on debt-holders is less than "the effective tax rate on the real return to equity." The basic interesting point is that it introduces debt-holders' average tax rates into the specification of the bias at all, as if a corporate borrower could somehow expect a tax-exempt or foreign investor to pass through the benefit of its exemption from United States income taxes to the borrower in the form of lower interest rates.

I do not suppose anyone thinks tax-exempt lenders voluntarily pass along the benefit of their own tax exemption to corporate borrowers—the question is whether the market is apt to do it. We do know that in the case of municipal bonds the market transfers some but not all of the benefit of tax exemption from lenders to borrowers. But that results from bonds carrying an exemption for their interest in the hands of otherwise taxable holders. It is hard to see why the benefit of a general tax exemption of a particular lender would get transferred to borrowers. One may argue that foreigners and tax-exempts are effectively taxable on their shares of corporate earnings from equity investments—the corporate tax, and in the case of foreigners some tax on their dividends—and tend to remain so taxable or to become taxable directly under most forms of integration.

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<sup>99</sup> [I have looked quickly in Nadeau88 for this specification and not found it. I looked in the initial description of the equations in Nadeau's model. Use of the term "measures" suggests the possibility that this somehow is something that emerges from the testing of the model, although its form suggests otherwise. Another possibility is that Treasury is citing from something prior to the final form of this particular paper.???

[At this point it is not clear to me whether  $td$  in the formula attributed to Nadeau incorporates data about the actual holders of corporate debt securities—as is assumed in the following paragraphs—or is simply the full ordinary income rate for an average or representative investor in corporate securities without the reductions embedded in  $te$ . Find out.]

In any event, this specification is apparently the reason why the Report shows only the CBIT as removing the bias in favor of debt finance. The Report says:

As modeled, CBIT eliminates differences in the taxation of debt and equity by taxing all corporate income once at the entity level at a 31 percent statutory rate. Under CBIT, corporate borrowing decisions would be undistorted by taxes. The other prototypes reduce debt's current tax advantage over equity less significantly.

The last sentence is a spectacular understatement: The Table reports an item entitled "Tax incentive to borrow" as follows:<sup>100</sup>

Undistorted	.000
Current law	.037
Integration Prototypes	
Shareholder Allocation	.035
Distribution Related	
Credit	.036
Exclusion	.035
CBIT	.000

I have not figured out whether the debt submodel in the Mutual Production Model is from Nadeau or whether it is something somewhat different, but it too shows CBIT producing much greater welfare gains with respect to this distortion than the other integration prototypes. Indeed this model, with scaled tax rate revenue replacement, shows dividend credit and exclusion integration producing quite substantial welfare losses! The text reports, with restraint, that "the distribution-related prototypes do not

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<sup>100</sup> Treasury Report c. 13, tan 43, Table 13.2. This is apparently on the assumption that revenue lost from integration is replaced by a scaled tax rate increase on all capital income. If it were replaced, instead, with a lump sum tax, Table 13.6 indicates that other forms of integration would reduce inefficiency in the choice between debt and equity by about half as much as CBIT.

improve corporate borrowing policy in this model," and explains, in a footnote, rather cryptically:<sup>101</sup>

As statutory tax rates rise to make the distribution-related prototype revenue neutral, the tax advantage of debt relative to equity also rises because the higher tax rates increase (1) the value of deducting nominal interest, and (2) the tax rate on purely inflationary capital gains. At the set of tax rates needed for revenue neutrality, these two effects, combined with a relatively large distortion in dividend policy, are sufficient to counteract the effect of the dividend exclusion or credit. As a result, relative to current law the tax benefit to debt rises, and corporations actually increase slightly their use of debt.

The welfare losses predicted in standard CGE models and discussed above in Part II are losses from misallocation of real resources—capital or labor or both. They represent failures to achieve an optimal (optimum?) mix of products<sup>102</sup> or to find the most efficient way of producing those products, or both. The welfare loss from distortion of debt/equity ratios is something quite different—apparently it is mostly the running of risks of bankruptcy beyond what financial markets would judge to be the optimal point. That is indeed a social cost; whether the social cost is accurately reflected in what financial markets would do in the absence of taxes is less clear. [Explain???] Perhaps this is why welfare gains from this source are separately reported in all the Tables in which they are reflected at all.

The Treasury Report assumes that there are nontax advantages and disadvantages to the use of debt instead of equity finance, that these are related to one another in a way that creates an optimal debt/equity ratio, and that the tax bias against equity will move corporations away from that optimal ratio to a greater use of debt, and that this involves welfare losses that can be measured the same way as those from investment distortions

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<sup>101</sup> Treasury Report c. 13, n. 53.

<sup>102</sup> [Explain that this means a Pareto optimum [?] without judgment about rich and poor.]

discussed in Part II—i.e., by multiplying the elasticity of demand for debt by the square of the magnitude of the tax.<sup>103</sup>

### *B. Payment of Dividends*

The second financial distortion is between the payment of dividends and the accumulation of earnings. As described in the Treasury Report, this distortion has nothing to do with the corporate income tax—presumably because that tax is payable on distributed and undistributed earnings alike. Instead, it arises from the fact that corporate income distributed as dividends is taxed forthwith, in full, at ordinary income rates, while accumulated income is not. The increase in share value that results from accumulating corporate earnings may be subject to individual income tax, but the burden of that tax is almost always much less.

The most obvious tax advantage for income in the form of share appreciation, throughout most of the history of the income tax, has been the bargain rate of tax on long-term capital gains—generally less than half the rate applied to dividends and other ordinary income.<sup>104</sup>

But the tax burden on capital appreciation is way below the nominal rate, in any case, by reason of the deferral of tax on capital appreciation until a shareholder disposes of his shares. "A common rule of thumb," says the Report, "is that the accrual-equivalent tax rate on capital gains is about one-fourth the statutory rate."<sup>105</sup> The accrual-equivalent tax (AET) rate is the

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<sup>103</sup> [A few words on Miller & Modigliani, which appears not to be cited at all in the Treasury Report? on thin authority cited on this question in the Treasury Report?]

<sup>104</sup> § 1(h). The capital gain rate differential was eliminated in 1986 when the top rate was set at 28 percent for both capital gains and ordinary income. But some differential reemerged quite soon as budget deficits led to reinstallation of ordinary income rates above 28 percent, and in 199x a full blown capital gain preference was reinstated when the top rate for most capital gains was set at 20 percent.

<sup>105</sup> Treasury Report c. 13, n. 10, citing Poterba, "Tax policy and corporate saving" (1987) and references cited therein. The Treasury Report goes on to say "This adjustment captures reductions attributable to deferral and to the fact that the basis of inherited property is stepped up to fair market value (eliminating the tax on capital gains accrued before the holder's death)." Ibid.

rate at which a tax imposed on unrealized appreciation annually as it accrues would be equivalent in burden to the taxes that are in fact later imposed upon realization (and recognition) of such appreciation. This concept obviously involves an estimate of an average—not a precise computation of anything and not even an estimate of the burden in any particular case, since periods of deferral as well as other factors will differ from one taxpayer to another.<sup>106</sup> For some substantial portion of individual gains,<sup>107</sup> § 1014 produces an out-right exemption—which is an effective individual tax rate of zero. Moreover, the AET concept does not capture the fact that the extent of deferral, and the likelihood of exemption via § 1014, are themselves influenced by the tax.

### 1. Cost of Capital

One consequence of the low AET rate on unrealized appreciation due to corporate accumulations, is to reduce the cost of corporate capital below what it would be if all corporate earnings were paid out as dividends. This reduction offsets to some degree the extra burden of the corporate income tax.

This point was made, indeed, in a prepublication comment on Harberger's 1962 paper; Harberger responded with an addendum in the published version, indicating that his general conclusions would still hold even if the additional burden of the corporate income tax were reduced by the difference between ordinary income and capital gain rates on total corporate income. The addendum suggests that this is a generous correction since obviously a substantial part of corporate income is distributed as dividends and thus taxed in full at ordinary individual income rates. Today it is widely understood that Harberger's adjustment is insufficient in another respect—in relation to the income that is not distributed—because deferral pushes the effective rate of tax on capital gains far below the statutory rate.

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<sup>106</sup> Even in a particular case, the AET is not fixed upon investment, since the actual persistence of deferral will depend upon subsequent decisions about continuation or termination of the investment.

<sup>107</sup> Assumed in the Treasury Report to be two-thirds. Treasury Report c. 13, n. 39.

General equilibrium models today, including those in the Treasury Report, all adjust for individual income taxes in essentially the way suggested by Harberger's addendum, but with extensive refinements. If a corporation does not pay dividends, its earnings will not be subject to immediate individual income taxation as they would be if distributed as dividends or if the earnings accrued directly to shareholders without the intervention of a corporation. Accordingly, the cost of equity capital raised by the issue of nondividend-paying shares, as augmented by the corporate income tax, is diminished by this reduction in individual tax. If a corporation pays out some but not all its earnings as dividends, then its equity capital is regarded as partly dividend-paying and partly nondividend-paying, in the same ratio as the prevailing dividend payout ratio. Prevailing payout ratio is commonly taken as the average payout ratio prevailing in the sector of the economy within which the corporation operates.<sup>108</sup>

These matters are put in formulae as follows:

The cost of dividend-paying equity, as indicated above, is  $r/(1 - c)$ , where  $c$  is the rate of corporate income tax and  $r$  is the rate of return demanded by investors.<sup>109</sup> The rate specified by  $r$  is the pretax rate for a fully taxable return, at the individual level.

The cost of nondividend-paying equity is then also specified as  $r/(1 - c)$ , but reduced by a factor expressing the difference between full, current, dividend taxation, and deferred capital gain taxation. This factor is  $(1 - m)/(1 - z)$ , where  $m$  is the rate of tax on dividends and  $z$  is the AET rate on capital appreciation. The cost of nondividend-paying equity is thus

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<sup>108</sup> This seems to imply an assumption that a corporation operates under some unspecified pressure to conform its payout ratio to an industry average. Nothing is cited to explain the source of this pressure or to indicate whether in fact corporations in particular industries exhibit similar payout ratios, or, if they do, to explore possible alternative explanations for such similarities.

<sup>109</sup> See formula (1) on page 8 above.

$$\frac{r(1 - m)}{(1 - c)(1 - z)} \quad (6)$$

For a shareholder who confidently expects to hold her shares until death,  $z$  will be close to zero and the cost of nondividend-paying equity approaches

$$\frac{r(1 - m)}{(1 - c)} \quad (7)$$

So for such a shareholder whose tax rate is the same as the corporate rate, the corporate cost of nondividend-paying equity capital is  $r$ , the pretax interest rate. And if the individual marginal rate is higher than the corporate rate, the cost of nondividend-paying corporate capital will be less than  $r$ .

These adjustments are all addressed to the question of getting the tax burden on operating within each corporate sector right. They are looking for something equivalent to a reduction in the corporate income tax rate to reflect tax advantages many of which arise from the individual income tax treatment of corporate income. Payout ratios and debt/equity ratios are specified as fixed parameters for each sector, and the fact that they might vary because of the tax features under investigation is ignored.

## 2. Reflecting the Bias

Besides this intersectional effect, the low AET rate of investor tax on accumulated corporate earnings raises another set of problems wholly within the corporate sector, because of the difference between investor tax burdens on dividends and on accumulated earnings. The difference between the AET rate on capital gains and the ordinary income tax rate on dividends is repeatedly described as creating a tax bias against the payment of dividends. In making this appraisal there is commonly no reference to the corporate income tax—indeed the Treasury Report declares that corporate income tax has nothing to do with it.<sup>110</sup> Presumably the thought is that

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<sup>110</sup> Treasury Report c. 13, \_\_\_\_.



corporate earnings are subject to the corporate income tax whether distributed or not, and so only the investor taxes create any distortion with respect to the distribution decision.<sup>111</sup> This description of the bias of present law against dividend distributions is stated repeatedly in the Treasury Report.<sup>112</sup>

There is a considerable body of economic literature concerning the tax treatment of shareholders. Most of it is concerned with the apparent tax advantage to shareholders of getting their gains in the form of capital appreciation instead of dividends, and the resulting question why corporations continue to pay dividends nevertheless.

Most of this literature reflects quite a different purpose from that of the CGE-Harberger literature; it is more concerned to answer the questions why corporations persist in paying dividends, and the strength of the dividend preference, whatever it is attributed to, than to measure the welfare loss resulting from the tax bias against that behavior.<sup>113</sup>

The Treasury Report discusses and borrows from this literature, but ultimately makes a rather different use of it. Treasury accepts the inference from the fact that dividends are paid, despite the tax bias, that there is some nontax reason to prefer dividends over accumulation, and that corporations would pay more dividends but for that bias.<sup>114</sup> The method of measuring welfare loss described in section II.B above is then applied to estimate the

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<sup>111</sup> Or maybe it is just a matter of defining scope of research—the question under investigation has been *defined* in terms of individual not corporate taxes.

<sup>112</sup> [Collect cites.]

<sup>113</sup> To a substantial extent the literature discussing this differential in investor taxes on dividends and capital appreciation is separate from that in the Harberger tradition. Much of it occurs in journals of "finance." ??? [This needs checking out.]

<sup>114</sup> So as in the case of corporate and noncorporate production, the implicit assumption must be that the desirability of dividends in relation to accumulation decreases as more is distributed and less accumulated, so that there is some optimum payout ratio in the absence of tax, and another, lower payout ratio, in the presence of the tax.

loss of social utility or welfare that results from this tax-induced distortion of behavior.

The dividend submodel includes these features:

The gain to shareholders from a dollar distributed as a dividend relative to an additional dollar of retained earnings is given by  $(1 - m)/(1 - z)$ , where  $m$  is the tax rate on dividends and  $z$  is the accrual-equivalent tax rate on capital gains. The model assumes an elasticity of the dividend payout ratio with respect to this measure of relative after-tax values of approximately unity. This estimate is conservative.... [Treasury Report c. 13, n. 42.]

There is a tax penalty on dividends under current law and various integration prototypes, and dividend payout ratios are estimated for each, as follows:

	Penalty	Ratio
Undistorted	.000	80.0%
Current Law	.011	72.0%
Integration Prototypes		
Shareholder Allocation	.000	80.0%
Distribution Related		
Credit	-.010	85.9%
Exclusion	-.005	82.9%
CBIT	.000	80.0%

The credit and exclusion prototypes thus overshoot the mark, creating biases *in favor* of dividends. This apparently results from the fact that the benefits of integration go only to dividends. The model does not assume that such integration would be accompanied by fully-utilized provisions for treating accumulated earnings as if they were distributed and recontributed.

The Augmented Harberger Model predicts welfare gains from integration with respect to dividend policy of 0.01 percent of consumption for credit integration and 0.03 for the other prototypes. In the Mutual Production Model only credit integration overshoots the mark, producing a 16 percent increase in dividends; the other prototypes produce increases of 9 or 10 percent. Apparently the latter is more on the mark: welfare gains are

0.07 percent of consumption for all prototypes except credit, for which the gain is only 0.01.

The nature of the welfare gain from increasing dividend payout ratios is not easy to specify. Much of the literature about this subject is quite uncertain what it is.

#### **IV. The Missing Connections**

The Treasury Report analysis, as described in Parts II and III, is rich in interrelations, and one might come away with the impression that if dividend payout is somehow related to investment the Treasury models in all likelihood will capture the connection. If one says accumulation of dividends represents a cheaper source of capital than is represented by the cost of  $r/(1 - c)$ , it can be answered that the Treasury Report takes care of that by showing a lower cost for nondividend-paying equity. But that still misses the most important connection—the fact that a corporation with a very high dividend payout ratio has a very cheap cost of equity capital just by exercising restraint in the matter of dividend increases. The missing connection in the Treasury Report is the recognition that not paying dividends *is* raising corporate capital, and that a bias against paying dividends *is* therefore a bias in favor of corporate investment, which tends to offset, not add to, the bias of the corporate income tax against corporate investment. And vice versa—the corporate income tax bias against corporate investment *is* a bias in favor of paying dividends. The Treasury models' blindness to these connections seriously undermines the credibility of their predictions and the usefulness of the analysis on which they are based.

In this Part I have tried to establish that criticism from several standpoints.

##### *A. Coherent Behavioral Assumptions*

Economic models, though stated in abstract equations, depend upon some reasonable picture of human behavior motivating those equations. So one way to approach the Augmented Harberger Model is to ask whether it gives a coherent picture of such behavior.

The behavior implied by the Augmented Harberger Model without Financial Distortions is that of investors who will not put money into a corporation unless they think it can make enough to give them the return they want after payment of corporate income taxes. Or it could be thought of as the behavior of corporate officials, who will respond to investor behavior by declining to make corporate investments at any pretax return of less than  $r/(1 - t)$ . So according to this model, if a corporation runs out of investment opportunities with a return of  $r/(1 - t)$  it should stop investing. It will therefore not seek to raise funds by issuing shares. And if it has any funds around from corporate operations, these should be distributed to shareholders for investment by them free of the burden of corporate income taxes. The driving force for the actors in this model is the search for investment opportunities that will produce the highest return, and the significance of different taxes in different sectors is that they make people demand higher pretax rates of return in higher tax sectors and vice versa.

The Treasury Report's submodels of financial distortions respond to a different question. Given investment in the corporate sector, and profits derived from that investment (even after corporate income tax), what is the best way to deliver the benefit of those earnings to the shareholders entitled to them? If they are paid out as dividends, taxable shareholders will have to part with a portion of them, forthwith, as income taxes. If they are held in the corporation, leaving it to shareholders to realize them through sales of shares, tax will be at least deferred, and likely imposed at a lower rate, and perhaps avoided altogether by reason of a step-up of basis at death. Given these tax advantages for accumulation, dividends should not be paid unless there are nontax advantages to the payment of dividends of at least equal magnitude. Since people in the world are assumed to act rationally, and dividends are in fact paid, there must be such nontax advantages.

This implied behavior appears to be that of different folk addressing different questions. Perhaps those who recommend corporate decisions about real investments are different from those in charge of finance, and the two models have to do with the bases on which those different persons make their recommendations. Or maybe just different consultants.

But now imagine a corporation trying to act in accord with both models. What happens if the corporation runs out of investment opportunities that return  $r/(1 - t)$  or better? The Investment Consultants then tell it to invest no

more—lower returns are only for noncorporate enterprises. But the Finance Consultants recommend lower dividend payout ratios, determined without reference to investment opportunities. So what happens if there are funds available which one consultant says not to invest while the other says not to distribute?<sup>115</sup> Should the corporation just let funds pile up in commercial paper? But it surely does not make sense to do that while real investments are available at returns less than  $r/(1 - t)$  but greater than  $r$ . Funds so accumulated would represent a lower cost source of funds to finance other, real, investments, and so the Augmented Harberger Model must be applicable with respect to all corporate investment, including that in commercial paper, to make sense of it.<sup>116</sup> Maintaining the Harberger equilibrium therefore requires that capital flow freely out of the corporate and into the noncorporate sector under these circumstances, but that is just what the finance economists' equilibrium asserts a bias against.

Or starting with the finance economists' equilibrium, what is the corporation to do with the money it would have distributed as a dividend but for the investor tax bias against payment of dividends? Again it cannot put the undistributed funds in commercial paper, because that does not earn the return required by the Harberger-CGE models. If there were an unlimited supply of investment opportunities at  $r/(1 - t)$ , then it could invest in these. But then the whole Harberger distortion would fall apart since no corporation would ever have invested in anything with a lower return even in the absence of a corporate tax.

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<sup>115</sup> Since 1980 many corporations, arguably, have responded by purchasing shares. To the extent they do that their shareholders pay less taxes than on dividends but perhaps considerably more than the AET rate, since the distribution represents an end to the deferral of tax. Interestingly, nominal capital gain rates have been relatively high since 1986, and share repurchases continue.

<sup>116</sup> [deleted text] Maintaining the Augmented Harberger Model investment equilibrium requires that the corporation refrain from making any investments at a lower rate of return. It therefore cannot just put the funds in commercial paper (as corporations not infrequently do, at least for a while), since that would represent an investment at far below the required rate.

For a mature corporation with earnings, dividend policy and whether to expand corporate investment are not separate questions—they are one question viewed from different perspectives. To retain earnings *is, ipso facto* and *pro tanto*, to expand corporate investments. If the individual income tax creates a bias against payment of dividends and the corporate income tax creates a bias against corporate equity investment, then the behavior we should be concerned with is that of the persons who have to choose between paying dividends and expanding investment.

What we need for a model is some rational hypothesis about how CEO's and Directors choose a course of action, not just how a specialized consultant, focusing on one perspective, might formulate advice.

### *B. Consistent Assumptions*

Another characteristic of economic models is their assumptions, and so another way to ask whether the Treasury Report has successfully integrated its financial and investment models is to ask whether the assumptions of those two models make up a consistent set of assumptions for the combined model. The answer is not at all. Indeed the output of the dividend submodel flatly contradicts the most basic assumption of the investment model and vice versa.

#### 1. Free Flow of Funds among Sectors

The most fundamental assumption of the Harberger-type general equilibrium models is that funds can flow freely from sector to sector, at least in the direction that the model dictates they should flow. The corporate sector regularly generates funds in excess of corporate investment needs, and so there is over time a substantial net flow of funds out of corporate solution. The Treasury Report has incorporated investor tax effects into its description of the Harberger equilibrium, as a reduction of prospective tax burdens from operating in the corporate sector, but it has not taken any account of the fact that investor taxes are themselves an impediment to the free flow of funds which is essential for attaining or maintaining the Harberger equilibrium. In the common case of a mature corporation generating more in earnings than it wants to invest (or can invest at  $r/(1 - t)$ ), attaining the Harberger equilibrium requires that surplus funds

flow freely out of corporate solution. But the investor tax, according to the financial economists' equilibrium, impedes that flow.<sup>117</sup>

## 2. Share Valuation

The finance equilibrium depends crucially on the assumption that a dollar retained by a corporation enhances the value of its shares by 100 cents. That equivalence is repeatedly asserted in the Treasury Report.<sup>118</sup> But the Harberger model just as surely asserts that a dollar in corporate solution will *not* enhance share value by \$1.00 unless it can be invested at a substantially higher pretax rate of return than is available to its shareholders on noncorporate investments of comparable risk. The Treasury Report makes no effort to reconcile this contradiction; there is no sign of awareness of it.

Achievement of any kind of coherent picture of corporate behavior requires relaxation of some one or more of the inconsistent assumptions underlying the two principal submodels in the Treasury Report. A prime candidate for relaxation is the assumption that a dollar of corporate assets enhances share value by 100 cents. If a corporation is deterred from making distributions, by taxes or anything else, it will have more to invest. If it runs out of opportunities to invest at  $r/(1 - t)$ , then the value of its shares will be enhanced by less than the extra-corporate value of the funds accumulated. And if that is the case, then the bias of the individual income tax against dividends will be offset, to some extent, by this effect, and some contribution will have been made to solving the puzzle of why corporations pay dividends.

Incorporation of investment distortions and financial distortions, including the dividend distortion, into a single model is a good idea—indispensable indeed for evaluating integration. But the Treasury Report

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<sup>117</sup> [Why not carry through briefly here with the Bradford point? That is, without getting into it in any formal way, just indicate how investors would have no incentive to shift investment from corporate to noncorporate sector unless after-tax return would go up by an amount sufficient to offset the collection of tax on the distribution.]

<sup>118</sup> [Collect citations.]

makes only a poor beginning at an adequately integrated appraisal. Basically, the investment distortion and dividend distortion models are too fundamentally different to mix without a more basic reexamination and reconciliation of their underlying premises.<sup>119</sup>

General equilibrium models of the corporate income tax only involve one kind of decision: where among two or more sectors to invest one's capital (and labor). Taxes are levied on operations within each sector, not on the act of investment or the transfer of resources from one sector to another. Tax rates vary from sector to sector and the model explores how resource allocation among sectors will be affected by those differences and by changes in them. These models are constructed on the assumption that capital can flow freely among sectors, at least in the long run.

The dividend distortion model conceives of the dividend tax as an excise on a particular form of activity within the corporate sector. It is unconcerned with the existence of a noncorporate sector. The decision maker in this model has no concept of investing in different sectors; her decision is only how much of corporate profits to pay out in dividends.

What neither model recognizes, and the Treasury Report does not seem to see, is that dividends *are* a flow of funds from the corporate to the noncorporate sector—indeed the biggest such flow, and until the 1980's far and away the biggest such flow. So what the dividend distortion model goes to in the general equilibrium models is not just the adjustment of a parameter but the fundamental underlying premise on which the whole general equilibrium analysis proceeds.

On the other hand, the dividend distortion model is constructed without reference to any corporate income tax. It thus implicitly assumes that there is no corporate income tax, or that if there is such a tax it does not affect

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<sup>119</sup> [This sounds as if perhaps if one had just stuck with one set of assumptions it would have been OK. I do not think that is so. So it is not just the inconsistency of assumptions that creates the problem. The assumptions of free flow and equal share and asset values are both wrong, each as demonstrated by the other literature. So the strong point is that both models are essential, but that they have to talk to one another at a deeper level.]



dividend payment decisions.<sup>120</sup> But the general equilibrium models taught us that a corporate income tax would induce a flow of capital out of the corporate sector and into the noncorporate sector, and until the last decade<sup>121</sup> such a flow has mostly taken the form of dividends. So again the conclusion of one model contradicts assumptions underlying the other. One cannot compose an integrated story about the economics of corporate income taxation by ignoring inconsistencies like that.

### *C. The Theory of the Second Best*

One is frequently reminded that welfare predictions of the sort contained in the Treasury Report are subject to the problem of the second best. That problem arises from the fact that the reasoning in making estimates of welfare gains or losses from a tax provision, for example, assumes that markets would produce an optimal (1st best) allocation of resources in the absence of that provision. The problem of the second best is that if there are other distortions affecting the behavior under investigation it is no longer clear that removing the distortion under investigation will accomplish any improvement. It may, but then again it may not.

I do not fully understand how economists deal with this problem, since in the real world we must know that most markets are full of other distortions. I would suppose that some would respond, at least implicitly, that perfect certainty is beyond our reach in most things, and that predictions of the best sort we can make are better than no predictions at all, theory of second best notwithstanding. That strikes me as a chancy position to take, given that the predictions in question are not of a sort that are subject to checking or correction through empirical observation.<sup>122</sup>

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<sup>120</sup> [That assumption emerges in the Treasury Report as an explicit assertion. Query? Find cites.]

<sup>121</sup> [Or two? Check the recent article on that.]

<sup>122</sup> There are some references in Harberger to this problem which I do not fully understand. In particular, Harberger64, I believe, seems to assert that the whole method of general equilibrium analysis somehow avoids problems of second best. I do not understand how.

It is possible to take a much more concrete view of the problem. Apart from the *theory* of second best, the theory of welfare evaluation used throughout the Treasury Report measures welfare gains as the product of a shift in behavior away from the undistorted optimal point times the average magnitude of the distortion producing that shift. If the system of taxation under investigation produces multiple distortions, like a bias against the payment of dividends and another against corporate investment, and the nature of the behavior under consideration is such that not paying dividends forces one to make equity investments, then it only takes common sense to see that the resulting behavioral impact of the two distortions is likely to be something *less than* at least one of the distortions would have produced by itself. If the shift in behavior is less, then by the reasoning underlying the whole business the welfare loss from the two distortions will be less, not more, and just adding financial distortions to resource allocation distortions as the Treasury does has to be wrong.

Moreover, even if there is a change in behavior as the net result of conflicting distortions, and we had a way to figure out what that was, one could only infer a sacrifice of nontax benefits equal to the product of that change times the net tax bias affecting the behavior, and so there is a need for subtraction rather than addition in the rate of loss branch of the argument as well.

So even if practical considerations justify overlooking the theory of second best as a counsel of perfection, they do not justify a failure to consider realistically and take careful account of the ways in which biases under investigation may conflict with one another in operation.<sup>123</sup>

## V. An Integrated Definition of Biases

### A. Dividend Distributions

The Treasury Report says corporate income taxes do not affect the decision whether to pay dividends.<sup>124</sup> But distributions do affect corporate

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<sup>123</sup> [Reexamine H64 to see whether it should be cited here.]

<sup>124</sup> [cite]

income taxes in the simple sense that subsequent earnings on the funds distributed will not be subject to future corporate income taxes as they would have been in the absence of the distribution. And if distributions will *reduce* future corporate income taxes, then the presence of the corporate income tax will *induce* distributions. This is the simple converse of the bias against equity contributions dealt with in the CGE models. If the corporate income tax creates a bias against contributions to corporate equity (as indeed it does), then it must create a bias of the same sort and magnitude against retention of earnings, which is to say, *in favor of* distributions.

So an integrated view of the effect of income taxes on dividends somehow has to take account of this bias as well as the individual income tax bias against dividends, at the same time, and as bearing on the same practical decision (to pay or not to pay the dividend—or more realistically, to raise or not to raise the dividend rate—or how often and how much to raise it). Moreover, if corporate and investor tax rates are close, the incentive effects of corporate and investor taxes may offset one another rather nicely. The return on particular assets will be taxed to the corporation while the assets are undistributed and to the investors thereafter, but never to both, and the investor tax on the distribution itself will have the same discounted value whenever it occurs.

Case 1: \$100 is held by a corporation until it doubles (after tax) and then is distributed. The tax on the distribution (at 30 percent) will be \$60, and shareholders will thus emerge with \$140.

Case 2: Alternatively, the \$100 might have been distributed immediately and invested by shareholders in the same way. The tax on the distribution would then have been \$30, leaving shareholders \$70 to invest. If the shareholders were able to invest at the same pre-tax rate of return as the corporation in Case 1, and are taxed on that return at the same rate as the corporation in Case 1, then over the same length of time as in Case 1 their \$70 would double, so that they too would emerge with \$140.

The result is the same in either case, and so there would not seem to be any net tax bias for or against the earlier distribution in Case 2. The

government is also unaffected; it gets only \$30 in Case 2, instead of \$60 as in Case 1, but it gets it enough sooner to make up for the difference.<sup>125</sup>

This offset of effects is far from perfect. In particular, the corporate income tax bias in favor of distribution is not confined to dividend distributions, and therefore the corporate and individual income taxes together create a big bias in favor of nondividend distributions. This bias has long been very familiar to practicing business tax lawyers working with close corporations, whether or not it is included in economists' models. Aggressive close corporation tax practice has long been dominated by the drive to get corporate funds out of corporate solution without incurring dividend taxes.

The commonest form of nondividend distribution is by share repurchase: if a corporation distributes funds in exchange for its own outstanding shares, then any shareholder whose proportional ownership of the corporation is sufficiently reduced will be taxed as upon a sale of shares rather than receipt of a dividend.<sup>126</sup>

Taxation as a sale means that part of what is received will be treated as a tax-free recovery of basis and the rest will be taxed as capital gain.

It is not clear why share repurchases took so long to become prominent for public corporations. If one looks at literature prior to the 1980's, one will find economists sometimes stating or assuming that there must be some tax-legal bar to public corporations buying their own stock.<sup>127</sup> Corporations

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<sup>125</sup> Indeed if the government made the same investment, its \$30 would grow to considerably more than \$60 over the same period, since its return would be the full market return unreduced by income taxes. But that advantage is just offset by the fact that it will collect 30 percent less in taxes from the shareholders' investment return of \$70 on \$70 than it would have collected from the corporation's investment return of \$100 on \$100. So the government is also unaffected by the corporation's choice between corporate and shareholder investment.

<sup>126</sup> § 302(b). [add some elaboration for economists?]

<sup>127</sup> [Find at least one cite. And now include and discuss recent paper attributing expansion to SEC notice that it would not object to market purchases.]

sometimes asserted that they only bought stock as needed for issue to employees or other special purposes. The 80's saw an enormous increase in stock repurchases by public corporations, without any apparent attempt by the IRS to assert dividend equivalence, or penalty-tax liability.

A somewhat less obvious method of nondividend distribution is the acquisition of outstanding equity of one corporation by another corporation for cash or debt. There was also a remarkably sustained spate of these transactions during the 1980's.

One problem in the economics literature is how much to regard these events as tax-driven. Economists look for refutable propositions of the form that says if some parameter increases (or decreases) then some particular behavioral response will occur. No such proposition can be asserted about the 1980's increase in nondividend distributions, because there were no relevant *changes* in the tax law in the early 80's to which to relate that increase. The relevant tax inducements have been there all along.

So it makes perfectly good sense to keep looking for something else as the trigger that set things off in that period. But to conclude that the explosion when it occurred was not tax-driven would be like saying a nuclear explosion is not the result of  $E=mc^2$ , since that was equally true long before the beginning of the nuclear era. Or like saying the 1848 Goldrush was not driven by greed or by California geology, since neither of these was new in the middle of the 19th Century.

Another prominent imperfection concerns differences, in tax rates between corporations and shareholders, not on dividends, but on the investment return which is taxed to the corporation in Case 1 and to the shareholders in Case 2. If the shareholders are taxed at a lower rate than the corporation on that investment return, then the tax law creates a bias *in favor of* distributions even if they are taxed as dividends.

Consider particularly the case of tax-exempt shareholders. For them, there is no investor-tax bias against distribution (since there is no investor

tax), and so the present system creates a big bias in favor of distributions in whatever form.<sup>128</sup> The Treasury Report does not recognize these effects.

Yet another bias, ironically, concerns capital gain taxes. The neutrality between accumulation and distribution described above assumed that returns were eventually to be realized by distribution. In the long run it is quite reasonable to think of the value of corporate shares as equaling the present value of all future distributions. But during any substantial deferral of distributions some shareholders will sell their shares, and for them the capital gain tax will be greater if funds were accumulated than if they were distributed, and so the capital gain tax creates a bias in favor of dividend distributions.<sup>129</sup>

### *B. Corporate Investment and the Cost of Capital*

The great bulk of corporate equity capital arises from accumulation of earnings.<sup>130</sup> This has been the case throughout the history of our income tax, and probably before. King (1977) asserts that this was the case in Great Britain prior to any income taxes, and describes reasons for it that might well have applied here, too.<sup>131</sup>

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<sup>128</sup> Except that if the investment return is profit from the active conduct of a business, then the unrelated business income tax is likely to make the rate of tax on the investor similar to what it would have been on the corporation. One of the intended effects of the unrelated business income tax is presumably to eliminate the big bias that would otherwise exist in favor of such distributions. See *Mueller Macaroni*.

<sup>129</sup> Reconsider Cases 1 & 2 at page 63 above. In Case 1, whatever increment to share values has occurred on account of the \$100 investment in question, will be subject to capital gains tax if a shareholder sells his shares before receipt of the terminal distribution. In Case 2, on the other hand, the shareholder's total basis (for shares and distribution proceeds) will have gone up by \$100 on receipt of the dividend and further as gain on the extra-corporate investment in question is recognized. If a sale of the shares takes place, therefore, the shareholders' capital gain will be greater in Case 1 and less in Case 2, which creates some bias in favor of the earlier distribution.

<sup>130</sup> [Cite from UST Report itself.]

<sup>131</sup> [Find citations.]

Raising corporate capital by accumulating earnings is the exact obverse [?] of paying greater dividends. With respect to any dollar a corporation earns it cannot both pay it out and accumulate it, but must do one or the other. Therefore any bias against payment of dividends is a bias in favor of capital accumulation and vice versa. More particularly, the individual income tax bias against payment of dividends described in the Treasury Report is a bias in favor of—a tax subsidy for—raising corporate equity capital by accumulation. An integrated view of the cost of capital under our corporate income tax system must take account of this bias at the same time, and as bearing on the same decision (to raise capital or to raise dividends) as the corporate income tax bias against equity capital. If those biases were equal (and were so understood) then decisions about raising capital by retention of earnings would come out exactly the same way as if there were no such taxes. The distortion created by the system can only sensibly be measured by subtracting the one bias from the other—not adding them together as the Treasury Report does.<sup>132</sup>

The same reasoning and conclusion apply to cost of capital. The cost of capital would indeed be raised by a factor of  $1/(1 - c)$  if a corporate income tax at a rate of  $c$  stood alone. But the cost of equity capital raised by retentions is reduced by the favorable treatment of shareholders under the individual income tax. It only costs a 31 percent bracket shareholder 69 after-tax cents to contribute \$1.00 to the capital of his corporation by not receiving \$1.00 of dividends, and *that reduces the cost of capital by 31 percent*. If there were a simple deduction for purchases of newly issued shares, all would recognize a reduction in the cost of corporate equity capital.<sup>133</sup> Deferral of investor taxes on retained corporate earnings produces exactly the same effect as such a deduction.

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<sup>132</sup> Cite the relevant tables where the addition is crystal clear. Table 13.6 is one. [Others?]

<sup>133</sup> This point should be expanded by reference to the way everyone now computes the effect of accelerated depreciation and other accelerated deductions on the cost of capital. Tell that story. Then tell how the story is the same for purchases of shares in corporations. And then make clearer how deferral of tax on accumulated earnings is exactly the same thing.

The net effect is that the cost of corporate equity capital raised by retention is something like:

$$\frac{r(1 - m)}{(1 - c)} \quad (8)$$

where  $r$  is the pretax interest rate,  $c$  is the corporate income tax rate and  $m$  is the investor's marginal rate of tax. (More precisely,  $m$  is the rate of tax the investor would pay if he received the corporate earnings directly without any corporation; the rate on dividends might be lower (or higher) provided it remains constant.) So, for example, if the corporate and investor income tax rates are equal, the cost of capital will be the pretax interest rate,  $r$ , just as if there were no taxes to contend with.<sup>134</sup> If the corporate rate is higher than the individual rate, the cost of capital raised by accumulation will be more than  $r$ . On the other hand, if the corporate rate were made significantly lower than the top individual rate, as it was throughout the entire history of our individual income tax until 1981, the cost of capital raised by retention from top bracket shareholders would be significantly less than  $r$ .

Actually, another factor should be added to reflect the accrual of capital gain tax liability with respect to retentions. Let the AET rate be denominated  $z$ , and the full formula then becomes:<sup>135</sup>

$$\frac{r(1 - m)}{(1 - c)(1 - z)} \quad (9)$$

This says, among other things, that if corporate and individual ordinary income tax rates were equal, but there is a capital gain tax in effect, the cost of accumulated corporate capital will be raised by the AET rate of that

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<sup>134</sup> See Case 1 on page 63 above.

<sup>135</sup> This formula is formally identical to the Treasury Report formula for the cost of nondividend-paying equity capital See. p. 34 above. Its scope of reference is critically different See Part IV.C beginning on page 69 below.



capital gains tax. For a shareholder who is sure his shares will not be sold until § 1014 wipes out any taxable gain, the AET rate is zero. For a shareholder who contemplates sale after a short period, the AET rate may be considerable.

In addition to describing cost of equity capital raised by retention of earnings, this formula confirms what was said in the previous section about the corporate tax system and dividends. If  $z$  is very low, perhaps because sales of shares are not contemplated, then corporate tax and individual income tax work against one another; if the corporate income tax were lower, there would be a net bias against dividends, not because of the tax on dividends but because of the lower after-tax return available on noncorporate funds. So long as the corporate income tax rate is higher, there will be a net bias in favor of distributions even if they are taxed as dividends.

From the standpoint of impact on dividends, the formula says if individual and corporate rates were equal, the capital gain tax creates an incentive to receive dividends. One way to explain that is in terms of basis: The investor gets a step-up in total basis from a dividend that he does not get from earnings accumulation, and so if he anticipates sale of his shares he will be better off for having received a dividend.<sup>136</sup>

### *C. Further Comparison with the Treasury Report*

The formula

$$\frac{r(1 - m)}{(1 - c)(1 - z)} \quad (10)$$

given here as the cost of equity raised by accumulation of earnings, is identical with the formula (3) in the Treasury Report discussed on page 28

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<sup>136</sup> Reconsider Case 1 on page 63 above, but with a sale of shares during the period of deferral.

above.<sup>137</sup> But its field of application in the Treasury Report was quite different—it was given there as the cost of capital of equity that does not pay dividends, however that equity might have been raised. The Treasury Report is wed to the Harbergerian process of measuring cost of capital by reference to steady-state conditions, just assuming that capital will flow freely as needed to equalize after-tax returns. The favorable treatment of retentions is therefore treated as part of the steady state. If a corporation operates in a sector of the economy with a payout ratio of 60 percent then for every dollar of capital raised, by accumulation or new share issue, 40 cents will be considered to have the cost given by this formula while 60 cents will be considered to have a cost  $r/(1 - c)$ .

This procedure completely misses the point that corporations with high payout ratios may nevertheless raise most of their equity capital by accumulating what they do not pay out, and that capital so raised has an after-tax cost to the shareholders of only  $(1 - m)$  times the dollars raised. On the other hand, the Treasury procedure understates the tax burden and resulting cost of capital for a nondividend-paying corporation that raises equity from new investors, by its heroic assumption that the value of corporate shares will be enhanced a full dollar for every \$1.00 accumulated.<sup>138</sup>

To make clear what the Treasury Report does and does not capture, consider two corporations, as follows:

*Example (2). Cost of Capital in the Case of Accumulation of Earnings.* Oldco is a mature, well established corporation, with little debt and an established dividend payout ratio of 70 percent. Its equity capital needs are met by the 30 percent of earnings accumulated.

The 70 percent payout ratio is of course a moderately long-term figure. Earnings are more volatile than the dividend yield the

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<sup>137</sup> [Check this cross reference with care. Also is the equation number (3) in the Treasury Report in this paper. (Yes to the latter.)]

<sup>138</sup> See section IV.B.2—Share Valuation, beginning on page 59 above.

corporation seeks to maintain, and so annual payout *ratios* are volatile, too. Investment needs are also volatile and do not match accumulation of cash flow on an annual basis. Short-term discrepancies between accumulation and investment are covered by selling investment securities or borrowing when investment needs exceed accumulation and repaying debt or purchasing securities when the imbalance runs the other way.

*Newco* is a start-up whose financial resources are stretched to the limit; it has borrowed all it can (without an unacceptable increase in the rate of interest it pays), and it pays no dividends. Hopes are high for the future, but that is not just around the corner. *Newco* operates in a sector of the economy where dividend payout ratios are generally low.

Which of these two corporations suffers a greater increase in cost of capital from the present tax system? According to the reasoning in the Treasury Report, *Oldco* suffers the greater burden since most of its capital is dividend-paying equity, with respect to which the extra burden of the corporate income tax is fully effective. *Newco*, by contrast, is entirely capitalized with debt and nondividend-paying equity, with respect to both of which the tax may add little or nothing to the cost of capital.

Under the more integrated view described here, which focuses on the margin for present investment rather than sectoral averages reflecting the outcome of past decisions, *Oldco* is seen to be in a position where it can readily borrow or delay dividend increases, either of which will give it new capital at a marginal cost much closer to  $r$ . For debt, there will be no increase in corporate taxable income on account of its return; and for accumulated earnings, while there will be a subsequent increase in corporate income tax, there will also be the compensating advantage of investor tax deferral, not on future earnings but on the dollar being presently accumulated and invested itself.

On the other hand, *Newco* is very apt to have to resort to new share issues, with respect to which the present law provides no comparable relief. With respect to this case, the Treasury Report understates the tax burden by

ignoring the burden of future corporate income taxes until such accumulation incurs.<sup>139</sup>

*D. Debt/Asset Ratios*

The cost of debt capital is the interest rate paid on it. The investor may be taxed on that return, but the corporation gets a deduction. The investor's taxes will not raise what he can demand as interest since he has to pay tax at his own rate on market-rate interest. (Tax-exempt state and municipal bonds sell at a lower interest rate to compensate for their tax exemption.) And the corporate income tax will not raise what the corporation has to make to pay the interest, because the corporate deduction for interest paid will make taxable income zero at the break-even point.

Again the interesting case involves corporate equity raised by retention of earnings (which is most of it). An integrated view must recognize that while debt has the advantage of corporate deductions for the future payment of interest, retention of earnings has the immediate advantage of an exclusion from investor ordinary income of the full amount of the capital raised. As a result, the tax law has favored retention of earnings over debt finance whenever the investor ordinary income tax on interest exceeds the combined effects of the corporate income tax and investor capital gain taxes on accumulation of equity. This helps to account for the fact that corporations have not, prior to the 1980's, been driven from equity finance into excessive debt.<sup>140</sup>

Consider the accumulation of earnings to pay off debt. If a corporation retains \$1,000 and uses it to pay off a bond that otherwise would have remained outstanding, future annual corporate earnings will be enhanced by  $\$1,000r^{(1-c)}$ . If the \$1,000 were instead paid out to shareholders, they could use it to purchase the outstanding debt on which the interest payment would continue at rate  $r$ , unreduced by corporate income tax. But the amount of bonds they could buy would not be the full \$1,000 that the corporation

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<sup>139</sup> See \_\_\_\_\_ below.

<sup>140</sup> [Quote to this effect from TR.]

could have paid off; instead it will be only \$1,000 minus the investor tax on \$1,000; i.e.,  $\$1,000 \cdot (1 - m)$ .<sup>141</sup> So the comparison stands again at  $(1 - c)/(1 - m)$  (or  $(1 - c)(1 - z)/(1 - m)$  if one wants to take account of the fact that the distribution-plus-purchase-of-bonds route will give the shareholders an increase in basis for their total investment which repayment of the debt does not).

The Treasury Report misses this connection. For it there is a corporate tax on the return on equity that is not there for debt. There is also some amelioration of individual taxes to the extent the corporation continues not to pay dividends. But there is no recognition of the reduction in the cost of equity capital that results right up front from the fact that it comes out of shareholders' pretax income in the first place, whether or not any part of earnings are accumulated ever again.

## VI. The New View

The economics in the Treasury Report are deeply rooted in tradition.<sup>142</sup> In two traditions, indeed: the Harberger tradition concerning cost of corporate capital and the finance economists' tradition concerning effects of investor taxes on dividend payout decisions. The main thing comparatively new is patching these traditions together in a single document.<sup>143</sup>

Other economists have created single, integrated models to address the interaction of corporate and investor tax effects. Their work is said to express the New View of corporate income taxation. The Treasury Report discusses the New View for several pages<sup>144</sup> and describes some empirical

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<sup>141</sup> [This certainly sounds as if  $m$  is the rate of tax on dividends. **Sort this out**].

<sup>142</sup> The Report explicitly states that it adopts the traditional view of corporate income taxation. See n. 18 above.

<sup>143</sup> The report indicates that incorporating debt/equity and payout ratios predicted by the dividend equilibrium into the Harberger equilibrium is a new departure?? But it cites Nadeau who claimed to do much the same thing.

<sup>144</sup> See pages 116-118, 140, 191 n. 26. The Treasury Report treats the New View as an alternative to its model for dividend payments.

data on which one might choose between the new and the traditional views. In conclusion it "adopts the framework suggested by the 'traditional view.'"<sup>145</sup>

I do not propose to go into the relative merits of the new and traditional views at any length here, but a few observations are in order.<sup>146</sup>

First, the New View, like traditional views, comes in a number of versions. Some of them contain mathematical equations of considerable complexity, with numerous parameters to describe a substantial number of features of the tax treatment of corporations and shareholders.<sup>147</sup> Some seek to enhance understandability by drastic simplification. One such, by David Bradford,<sup>148</sup> is elegantly abstract: it says a uniform tax on distributions from a corporation (without any other tax) would have no distorting effects on corporate investment or dividend payments. Such a tax would make corporate shares worth less by the amount of the tax,<sup>149</sup> but whatever set of choices between investment and distribution will maximize total corporate asset value will similarly maximize any fixed portion thereof, and so incentives for investment of funds in the corporation are unaffected by the tax. And the timing of distributions is unaffected, too, because the value of deferring the distribution tax is exactly offset by the growth in what there is to distribute.

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<sup>145</sup> See n. 18 above.

<sup>146</sup> For a very useful critical summary of the literature, published in anticipation of the Treasury Report, see Zodrow, G., "On the 'Traditional' and 'New' Views of Dividend Taxation," *National Tax Journal*, 44: 497 (1991).

<sup>147</sup> [Auerbach and King]

<sup>148</sup> Bradford, David F., "The incidence and allocation effects of a tax on corporate distributions," *Journal of Public Economics*, Vol. 15 (February 1981). p. 1.

<sup>149</sup> A 31 percent uniform distributions tax would make corporate shares worth only 69 percent of what they would be worth in the absence of the tax, or of what the assets would be worth if owned directly by the shareholders and able to be used the same way as by the corporation.

The Bradford model has nothing in it for the corporate income tax. And it has no tax on investors on any kind of income except distributions from corporations.<sup>150</sup> Furthermore, it makes no provision for corporate debt. And it makes no provision for tax-exempt shareholders. Finally it makes no provision for taxes on sales of shares.

So what does such a model have to do with current reality? Apparently it is assumed that corporate and investor taxes on nondividend income can be omitted because they constitute a relatively uniform single first tax on corporate and noncorporate income alike, with the second tax, on distribution, taken as the distinguishing feature of the corporate income tax system.<sup>151</sup> As to the rest, it is simply not part of the purpose of Bradford's paper to illuminate them.<sup>152</sup>

Compare Bradford's abstraction with Harberger's original model, in terms of what is excluded from consideration. Harberger excluded investor taxes, and focused on the corporate income tax as the extra imposition. Bradford excludes the first tax on income as earned, whether corporate or noncorporate, and focuses on the dividend tax as the extra imposition on corporate income. Bradford's model thus excludes from consideration the effects of rate differences between investors and corporations and among investors,<sup>153</sup> while the Harberger model covers up enormously important differences in timing of investor taxes resulting from incorporation. Bradford's model is thus better in excluding taxes that are comparable in terms of timing, but it covers up differences in rates. If all business income were taxed at the same rate when earned, whoever the owner of the business

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<sup>150</sup> Indeed it is irrelevant whether the tax on distributions is collected from investors or from the corporation itself, since it is a single-flat-rate tax in either event.

<sup>151</sup> Cf. UST proposal to integrate by eliminating the tax on distributions instead of the corporate tax.

<sup>152</sup> [Quote Bradford on what his purpose was.]

<sup>153</sup> As he clearly understood and pointed out: "The problem on this view is not the extra tax imposed on distributions, but the divergence between shareholder and corporation tax rates on retained earnings." Bradford, p. 2.

might be, then the Bradford model would be less removed from reality; but it isn't.<sup>154</sup> On the other hand, the Harberger model would be nearer the mark if all shareholders were tax-exempt or if all were taxable at the same rate *and* all corporate earnings were paid out as dividends; but they are not.<sup>155</sup>

The Treasury Report discusses the New View for several pages. It cites "empirical evidence" of negative correlation between tax rates on dividends and payout ratios, which it says is "is consistent with the traditional view."<sup>156</sup> The Treasury Report accordingly "adopts the framework suggested by the 'traditional view.'"<sup>157</sup> An examination of the cited evidence suggests, however, that it mostly only shows that the most abstract version of the New View does not give a very accurate picture of reality. In any event it does not provide support for the version of the traditional view "adopt[ed]" in the Treasury Report.

One repeated criticism of the New View begins by describing it as a view according to which dividends are simply what is left over out of earnings after new investment.<sup>158</sup> Since earnings and investment are both volatile, and somewhat independent of one another, dividends should be even more volatile.<sup>159</sup> In fact, dividends are much less volatile than either

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<sup>154</sup> The Unrelated Business Income Tax brings the world nearer to meeting this condition than one might at first have thought, since the biggest source of tax rate differentials in today's world arises from the prominence of tax-exempt investors among the ranks of shareholders.

<sup>155</sup> For purposes of this assertion it probably makes best sense to think of the UBIT as a part of the corporate income tax and the direct conduct of an unrelated business by an otherwise tax-exempt owner as a corporate operation.

<sup>156</sup> Treasury Report, 117.

<sup>157</sup> See note 18 above.

<sup>158</sup> "Dividends are determined as a residual after the firm undertakes all profitable investments." Treasury Report 116.

<sup>159</sup> Find a citation (in P&S or elsewhere) and conform language about independence. [Volatile does not seem to appear in relevant parts of Treasury Report.]



earnings or investment. Ergo, avoid the New View and stay with more traditional ideas.

I have been unable to find where in the New View literature itself dividends are described as a mere residual from earnings and investment. If one thought that both earnings and investment were determined by something else, the very abstract Bradford model might be read as indicating that dividends *could* readily play the role of residual without tax penalty. But it equally indicates that dividends can play any other role without tax penalty. Most specifically, it indicates that there is no particular tax penalty for holding corporate funds in bank accounts or commercial paper or anything else a corporation may put its money in for longer or shorter periods of time, even though the return thereon is much nearer to  $r$  than to  $r/(1 - c)$ . Under these circumstances, it seems reasonable to expect that corporations would set dividends at what they believe to be a sustainable level, and then let the short-term residual from earnings, dividends and serious investment be corporate lending or borrowing. The Bradford model, and other versions of the New View, in the main suggest that this course of conduct will involve much less of a tax penalty than is suggested or implied by traditional views of the matter.

Another repeated criticism is that the New View assumes the only way a corporation can distribute funds is by dividends, whereas in fact corporations now make substantial distributions by share repurchase and acquisitions.<sup>160</sup> It is true that the Bradford model does not include nondividend distributions. But neither does it contain corporate borrowing. One might therefore, with equal plausibility, reject the New View because it assumes that corporations do not borrow.

The Bradford model is very abstract, and does not deal with stock repurchases, just as it does not deal with corporate borrowing and tax exempt shareholders. Since it does not deal with them, it does not explain

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<sup>160</sup> "Corporations also distribute significant amounts of earnings to shareholders by repurchasing shares. This is inconsistent with the assumption underlying corporate financial policy under the New View." Treasury Report 117. [**Find and quote Poterba assertion that this is the main objection to it.**]

them. A highly abstract model cannot be expected to explain much of the detail of a complicated real world.

Despite that, however, the implication of the Bradford model for nondividend distributions is very clear: the tax system creates a strong bias in favor of such distributions. The mystery about nondividend distributions, under the new or traditional views, is why they were so relatively rare prior to 1980, and why even now they have not replaced dividends entirely. The New View has no answer to that puzzle, but neither do any of the traditional views have any very satisfactory answer to it. Other versions of the New View make specific provision for nondividend distributions and indicate clearly that they are preferable to dividends from a tax standpoint under our present tax law.<sup>161</sup>

There have been some more technical econometric assays of the New View.<sup>162</sup> This is not the place<sup>163</sup> for any extensive review of that literature, but it is worth noting that the version of the New View put to the test is again a highly abstract version, with no provision for corporate borrowing, or for capital gain taxes.<sup>164</sup> The safest conclusion to be drawn from this material may simply be that the New View of dividend taxation does not provide an elegantly simple explanation for complex patterns of financial behavior.

Moreover, whatever one concludes about any particular version of the New View(s), the version of the traditional view supported by this empirical work is not the Treasury Report's patchwork of traditional views.<sup>165</sup> The

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<sup>161</sup> [Cites to King and Auerbach. Point out that this conclusion may change in the face of dividend integration. Other versions of the New View specifically model this effect.]

<sup>162</sup> In particular, the Treasury Report cites P&S1985.

<sup>163</sup> Nor am I the person.

<sup>164</sup> [British data; why valuable; anything on other tax changes not captured by the model.]

<sup>165</sup> Get in here somewhere something to the effect that it is a model specifically designed to assert what the data shows. So no wonder it wins the empirical test.

traditional model tested has only to do with dividend determination, not corporate investment.<sup>166</sup> There is nothing in it that says it is coherent to combine that dividend determination model with the CGE-Harberger model of corporate investment without taking account of either within the other. And finally, the version of the finance model that finds support in the data is different in important respects from the finance model in the Treasury Report.<sup>167</sup>

Finally, the principal empirical work cited by the Treasury Report does not provide support for its pervasive assumption (assertion?) that corporate shares are worth the value of corporate assets.<sup>168</sup> The model tested takes corporate shares to be worth the present value of their total, future, after-tax yield. The authors have elsewhere made it completely explicit that under the traditional view, as they use the term, corporate shares will indeed be worth less than the present value of corporate assets held and operated in noncorporate form, by an amount that reflects the differential burden of tax on corporate income, whether that differential burden is thought to be represented by the dividend tax (Bradford) or the corporate income tax (Harberger) or by some more articulated evaluation of their combined effect (Auerbach and King).<sup>169</sup>

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<sup>166</sup> Query. I have some dim recollection of some conclusion in P&S relating to investment.

<sup>167</sup> Difference in share valuation implication. Is that a difference in the model or in the description of its implications. Methinks the model. The model asserts that share value is the present value of all future distributions, while Treasury just assumes it is corporate asset value.

<sup>168</sup> P&S1985.

<sup>169</sup> OMT?? [P&S \_\_ and/or Poterba \_\_ and/or Summers\_\_.]

## VII. Conclusions



### A. Summary

- (1) Describe abstraction in the economic analysis of corporate taxation.
  - (a) Study effect of individual income taxes on dividend payout ratios.
    - (i) That excludes corporate income tax.
    - (ii) Also excludes corporate investment implications of not paying dividends.
  - (b) Or study effect on corporate investment of excess tax burden on corporate income.
    - (i) Excess burden on corporate income means corporate income tax but adjusted downward for
      1. corporate tax savings from debt
      2. personal tax savings from equity that does not pay dividends
    - (ii) both these adjustments are most generally made on the basis of sectoral averages
    - (iii) that limits consideration of the individual income tax and excludes considerations in a) above
    - (iv) similarly limits consideration of financing side of investment decisions

- (v) or more accurately perhaps, it incorporates a strange assumption about financing: that it must follow existing ratios
  - (vi) or one could say, it uses average existing financing instead of marginal financing.
- (2) Treasury tries to stick these two bodies of work together, but fails to achieve any satisfactory integration.

### B. *Implications*

- (1) Welfare gains from integration are vastly overstated, because things were added together that ought to have been subtracted from one another.
- (2) Biases are misspecified, and therefore do not provide sound guidance.
- (3) What should be done.
  - (a) microintegration
  - (b) heavier tax on nondividend distributions
  - (c) more attention to rates and rate relationships
    - (i) argument for capital gains relief on corporate shares
    - (ii) argument for keeping corporate rate *below* top individual rates, if what you want is to facilitate and encourage a long term investment
    - (iii) the magic of compounding.

### C. *Further Questions*

- (1) What does all this imply about the utility of economic research of the kind discussed if it were not put together into an unintegrated amalgam to discuss the topic of integration

- (2) Harberger-type CGE analysis
  - (a) theory of second best
- (3) Individual income tax effects on dividend payout?