



# Tax Policy Center

Urban Institute and Brookings Institution

## HOW TPC DISTRIBUTES THE CORPORATE INCOME TAX

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### ABSTRACT

Recent economic research has improved our understanding of who bears the burden of the corporate income tax. One key finding is that a substantial share of the return to corporate capital is from “supernormal” returns, the returns to successful risk taking, inframarginal returns, and economic rents in excess of the “normal” return (the riskless return to waiting). The other key result is that international capital mobility shifts some of the corporate income tax burden on the normal return from corporate capital to labor, which is relatively immobile internationally. Based on these recent research findings, TPC has updated its corporate income tax incidence.

For standard distributional analyses, TPC now treats 20 percent of the corporate income tax burden as falling on labor, 20 percent on the normal return to all capital, and 60 percent on the supernormal returns to corporate equity (shareholders). Previously, we had treated the entire corporate income tax burden as being borne by the total returns to all capital. Our updated approach to incidence reduces somewhat the measured progressivity of the corporate income tax, but has little effect on the distribution of the total federal tax burden. We now also distinguish the incidence of changes in the corporate income tax that affect only the normal return, such as changes in cost recovery rules, which we distribute 50 percent to labor and 50 percent to the normal return to all capital. In addition, for short-run analyses of changes in the corporate income tax we now treat all of the burden as falling on shareholders.

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## HOW TPC DISTRIBUTES THE CORPORATE INCOME TAX

The Urban-Brookings Tax Policy Center (TPC) has updated its methodology for distributing the burden of the corporate income tax among taxpayers to reflect the latest findings in the economics literature on the incidence of the tax. This paper summarizes the recent literature on corporate tax incidence, explains TPC's updated incidence assumptions, and describes how TPC implemented these assumptions in its microsimulation model. It concludes with a discussion of the effects of the new incidence assumptions on the distributions of the corporate income tax burden and the total federal tax burden.

TPC's updated incidence assumptions for standard distributional analyses are that 20 percent of the corporate income tax burden is borne by labor, 20 percent by the normal return to all capital, and 60 percent by the supernormal returns to corporate equity (shareholders). Previously, like most other groups producing distributional analyses, we had assumed that the entire corporate income tax burden was borne by the total returns to all capital.

The change in assumptions is based on two main results from the recent literature. One is that a substantial share of the return to corporate capital is due to "supernormal" returns—the returns to successful risk taking, inframarginal returns, and economic rents—in excess of the "normal" return (which only compensates shareholders for the amount they could earn on riskless assets such as high-grade government bonds). We use the low end of the range of recent estimates for this "supernormal" share, 60 percent, and assign it only to shareholders.

The other result is that international capital mobility shifts some of the corporate income tax burden on the "normal" return from corporate capital to labor, which is relatively immobile internationally. We use the middle of the range of recent plausible estimates for labor's share of the normal return, 50 percent. Because the total normal return is 40 percent, labor's share of the total corporate income tax burden is 20 percent. The remaining 20 percent of the total burden is on the normal return to all capital.

TPC's updated incidence assumptions reduce somewhat the measured progressivity of the corporate income tax, because some of the burden is assumed to be on labor. But because the corporate income tax constitutes a relatively small share of total federal taxes, the reduction in its measured progressivity affects the measured progressivity of the entire federal tax system only modestly.

TPC's updated methodology also uses different incidence assumptions depending on the nature of changes in the corporate income tax and whether an analysis examines short-run or long-run effects. Changes in cost recovery provisions, for example, only affect the normal return to capital and therefore are distributed 50 percent to labor and 50 percent to all capital income. As a result, an increase in corporate revenues due, for example, to scaling back accelerated depreciation would be less progressive than the baseline corporate tax, for which the burden on labor is only 20 percent. In contrast, changes that also affect supernormal returns, such as changes in rates, are distributed in the same way as the baseline corporate tax.

TPC's basic distribution tables show the fully phased-in distributional effects of changes in the corporate income tax and other taxes. In the short run, however, the burden of a corporate income tax change cannot be shifted, so it falls entirely on shareholders. Therefore, the short-run distribution of a corporate tax change is more progressive than the long-run distribution, which takes account of shifting of capital to the non-corporate sector and overseas to avoid the tax.

### **Incidence of the Corporate Income Tax**

The incidence of all taxes is on households, who bear the burden of taxes through reductions in income from one or more sources (such as wages, interest, and dividends), or through higher prices for goods and services they consume. Distributional analysis assigns these burdens to each household according to the incidence assumptions and the household's sources of income and consumption patterns.

The incidence of the corporate income tax is perhaps the least settled issue in distributional analysis. The tax applies to corporate equity returns, because workers' earnings, interest paid to bondholders and other lenders, and other business costs are deductible in computing taxable profits. Therefore, the legal incidence of the corporate income tax is on the equity returns of shareholders of taxable corporations.<sup>1</sup> The earliest distributional analyses of the federal tax burden followed the legal incidence of the tax, assigning the corporate tax burden to shareholders.<sup>2</sup>

The economic incidence of the tax, however, may differ significantly from its legal incidence if responses to the tax by investors, workers, or consumers shift some of its burden away from shareholders. Shifting investment (capital) from corporate to noncorporate businesses could reduce returns to noncorporate investors, for example, and shifting investment abroad could reduce wages for domestic workers. The economics literature on corporate tax incidence subsequent to the earliest studies examined in detail the technological and market forces through which economic incidence can differ from legal incidence. Economists have long agreed that some of the corporate income tax burden is shifted away from shareholders, but there is no consensus on how the burden is divided among shareholders, other capital income recipients, workers, and consumers.

In a highly influential 1962 paper, Arnold Harberger formalized the analysis of corporate income tax incidence in a simplified general equilibrium model of a closed economy. Although Harberger examined a number of alternative specifications for the model, his basic model has two sectors (corporate and noncorporate) producing goods and services, two inputs to production (capital and labor), fixed total supplies of capital and labor, perfect mobility of capital and labor between sectors (i.e., capital owners and workers receive the same after-tax return in each sector), and a closed economy (i.e., there are no international movements of capital, labor, or goods and services). Firms and households respond to changes in relative prices according to

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<sup>1</sup> The equity returns of owners of subchapter S corporations and partnerships are not subject to corporate income tax. Instead, these profits are passed through to owners and taxed under the individual income tax.

<sup>2</sup> See Atrostic and Nunns (1991) for a description of these early distributional analyses.

fixed elasticities of factor substitution and fixed elasticities of demand.<sup>3</sup> Each sector has its own production technology, which may differ in the relative employment of labor and capital (factor intensities), and both sectors exhibit constant returns to scale, meaning that doubling labor and capital inputs doubles output.

The Harberger model explicitly identifies the incidence of the corporate income tax—its effect on households' income and the prices they pay for goods and services. The corporate income tax initially reduces the return to capital in the corporate sector, causing investment (capital) to move to the noncorporate sector where the return is untaxed under the corporate income tax and therefore higher.<sup>4</sup> This movement of capital from the corporate to the noncorporate sector drives the (pretax) return up in the corporate sector and the (untaxed) return down in the noncorporate sector. Capital continues to move until the after-tax return in the corporate sector equals the now lower (but untaxed) return in the noncorporate sector. The corporate income tax thus reduces returns to capital received by investors in both sectors. This movement of capital could also affect the productivity of labor, and therefore wages, by changing the capital to labor ratio in each sector.

In addition to its effects on returns to capital and labor, the corporate income tax affects the prices of goods and services purchased by households. Production costs in the corporate sector are higher because the sector's cost of capital now includes the corporate income tax. With higher production costs the prices for goods and services the corporate sector sells to households must also rise relative to the prices for goods and services sold by the noncorporate sector.<sup>5</sup> So as consumers, households are made relatively worse off by the corporate income tax to the extent they purchase goods and services produced in the corporate sector, but relatively better off to the extent they purchase goods and services produced by the noncorporate sector. Such relative price effects impose a burden on some households but benefit others. For a typical household, however, these price effects are offsetting, so the corporate income tax does not impose a net burden on consumption.<sup>6</sup>

With no net burden on consumption, the entire burden of the corporate income tax must fall on capital, labor, or both. The share of the burden that falls on capital and the share that falls on labor are determined by the various elasticities and factor intensities specified in the model. When Harberger calibrated the model to estimated elasticities and factor shares for the U.S. economy, he found that the entire corporate tax burden falls on capital (including noncorporate capital), with essentially none of the burden on labor. Harberger summarized his findings: "It is hard to avoid the conclusion that plausible alternative sets of assumptions about relevant

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<sup>3</sup> The elasticity of factor substitution measures the change in the capital-labor ratio resulting from a change in the relative prices of capital and labor. The elasticity of demand measures the change in consumption of a good or service resulting from a change in its price relative to the prices of other goods and services.

<sup>4</sup> Returns to capital from both the corporate and noncorporate sectors are subject to individual income tax, but here we are interested only in the differential effect of the corporate income tax across sectors.

<sup>5</sup> Note that it is the *relative* prices of goods and services produced by the corporate and noncorporate sectors that matter for any burden on consumption. The overall price level might be unchanged or rise, depending on actions taken by the Federal Reserve. The Harberger model takes any change in the overall price level into account by measuring returns to capital and labor in real (price-level adjusted) terms.

<sup>6</sup> Because such relative price effects sum to zero (i.e., impose no aggregate net burden or benefit), they are generally not taken into account in Harberger-type models.

elasticities all yield results in which capital bears very close to 100 percent of the tax burden” (1962, 234)

Harberger’s main result—that the entire corporate income tax burden is spread across corporate and noncorporate capital—was widely adopted as the standard incidence assumption in subsequent distributional analyses. The assumption was made in papers by academics such as Browning and Johnson (1979) and Feldstein (1988). It was also made by analysts in the federal government, first by Treasury in *Blueprints for Basic Tax Reform* (1977) and later for all Treasury distributional analyses (see Nunns 1995 and Cronin 1999),<sup>7</sup> by the Tax Analysis Division of the Congressional Budget Office (see CBO 2012<sup>8</sup>), and, for the brief period (1993–1994) that they distributed the corporate income tax, by the Joint Committee on Taxation (JCT; see JCT 1993). TPC also adopted the assumption for its distributional analyses (see Rohaly, Carasso, and Saleem 2005).

### *International Capital Mobility*

A key aspect of the original Harberger model is that the economy is closed, so that corporate capital can move to the noncorporate sector of the U.S. economy, but not overseas, in response to the corporate income tax. That assumption seemed reasonable when the U.S. economy and capital stock represented a substantial share of the world economy and capital stock and international capital flows were fairly limited. Over time, however, the relative size of the U.S. economy and its capital stock have fallen and international capital mobility has greatly increased, raising the potential for shareholders to avoid a portion of the corporate tax burden by shifting capital abroad. The evolution of the U.S. economy and the growing recognition among economists of the potential importance of internationally mobile capital (and relatively less mobile labor) on the incidence of the corporate income tax precipitated a number of theoretical and empirical research papers on the issue, which are only briefly summarized here.<sup>9</sup>

Randolph (2006) develops an extended Harberger model to examine the implications of an open economy on Harberger’s results. In Randolph’s model, labor is immobile internationally, so a reduced domestic capital stock will mean that much of the corporate income tax burden falls on domestic labor as the capital-labor ratio, and therefore labor productivity, falls. The allocation of the burden between domestic and foreign capital and domestic labor (and possibly land) depends on several factors, including the relative size and mobility of the domestic capital stock, the allocation of corporate capital across industries that produce traded and nontraded goods, product and factor substitution elasticities, and whether and how foreign governments react to changes in U.S. corporate income tax policies. Calibrating the model to the U.S. economy, Randolph shows that in the “base case” (with perfectly mobile capital, internationally immobile labor, perfect substitutability between domestic and foreign products, and no change in foreign tax regimes),

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<sup>7</sup> As discussed below, Treasury has recently revised its corporate income tax incidence assumptions.

<sup>8</sup> As discussed below, CBO has also recently revised its corporate income tax incidence assumptions. In some earlier analyses, CBO also presented distributions under alternative corporate income tax incidence assumptions—that some or all of the tax is borne by labor. See, for example, CBO (1987).

<sup>9</sup> Harberger has authored several of these papers, in which he argues that for the analysis of the incidence of a single country’s corporate income tax, an open economy model is appropriate. See, for example, Harberger (2008). For additional references and more comprehensive reviews of the recent literature, see Auerbach (2005), Gentry (2007), and Gravelle (2010, 2011).

70 percent of the corporate income tax burden is borne by domestic labor and 30 percent by domestic capital. This is a dramatically different result from the 100 percent burden on (domestic) capital found in Harberger's closed economy model.

Randolph finds that worldwide, capital bears 100 percent of the U. S. corporate income tax burden, with gains to foreign labor offsetting the losses to domestic labor and the entire net burden of the tax falling on domestic capital and labor.<sup>10</sup> This worldwide result is similar to Harberger's closed economy result, except that labor incomes do not equalize due to labor's international immobility. Randolph also conducts simulations using alternative model parameters, finding that domestic labor bears a lower share of the corporate income tax burden if capital is not perfectly mobile internationally, and in certain other circumstances.

Gravelle reviews Randolph's and several similar studies that use open economy general equilibrium models to analyze corporate tax incidence. She also reviews the most recent econometric estimates of factor, product, and portfolio substitution elasticities, and uses these estimates to adjust the various model results. She summarizes: "Taken together, these results, albeit imperfect, suggest that an assumption that 40 percent of the corporate tax burden falls on labor and 60 percent falls on capital is consistent with open-economy models and with the current empirical evidence regarding the appropriate parameter values for those models" (2010, 26).

Other recent studies reviewed in Gravelle (2011) and Jensen and Mathur (2011) have approached the issue econometrically. These studies use variations in corporate income tax rates across countries or states, or a wage-bargaining model, to estimate the effect of the tax on wages. Both Gravelle and Jensen and Mathur note the various econometric issues such studies confront: endogeneity, sample selection, comparability of data, measurement error, and omitted variables bias. Jensen and Mathur note that most of the studies use standard methods to try to address these issues. Gravelle observes that corporate income tax incidence is the result of general equilibrium effects, which these studies, based on firm, state, or country wages, cannot adequately control for.

The recent empirical studies reach sharply different estimates of labor's share of the corporate income tax burden. Some find shares that fall in the same range as the results from recent Harberger-type models, but others find far higher shares, ranging between 200 to 400 percent. Jensen and Mathur suggest that the higher range could indicate much higher deadweight losses from the corporate income tax than previous estimates indicated. Gravelle characterizes these high estimates as "improbable."

### **Incidence Issues Not Addressed in Harberger-Type Models**

The Harberger model and extensions of it by Randolph and others all examine the long-run incidence of a pure tax on the (riskless) normal return to corporate (equity) capital, assuming constant returns to scale in production and perfectly competitive markets. Results from these models provide guidance on how the portion of the corporate income tax that falls on the normal return to capital might be allocated between capital and labor in a standard, long-run

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<sup>10</sup> The burden on foreign capital is offset by the gains to foreign labor, so there is no net foreign burden.

distributional analysis. But these models do not provide direct guidance on the incidence of the tax on returns above the normal return to capital, the incidence effects of provisions that cause taxable income to differ from economic income, or differences between short- and long-run incidence. Each of these incidence issues can be critical to a distributional analysis of the corporate income tax or proposed changes to it.

### *Supernormal Returns*

Corporate profits include both “normal” and “supernormal” returns. To attract equity capital, corporations need to compensate shareholders for the time value of money and the opportunity costs of forgoing the income they could earn on riskless assets (such as high-grade government bonds). This riskless return to waiting is the “normal” return to capital. But profits also include the returns to successful risk taking,<sup>11</sup> inframarginal returns, and economic rents.<sup>12</sup> If these “supernormal” returns are pure rents, they bear the full burden of the corporate income tax and this portion of the burden is not shifted from shareholders, even in the long run.<sup>13</sup> However, if supernormal returns are the result of entrepreneurial labor (e.g., Bill Gates and others who founded Microsoft), taxing those returns could discourage such entrepreneurial efforts and some of the burden could fall on domestic labor generally by making workers less productive.

A number of studies have estimated the share of corporate income that represents supernormal returns. Gordon and Slemrod (1988) compute taxable corporate income under a cash flow tax, which would only tax supernormal returns, but they do not compute the share it represents of corporate income. Gentry and Hubbard (1997) estimate that supernormal returns represent 60 percent of the total returns to equity. Using the same approach as Gordon and Slemrod, Toder and Rueben (2007) estimate that only 32 percent of corporate returns are normal, implying that 68 percent are supernormal. Recent estimates reported in Cronin, Lin, Power and Cooper (2012), based on aggregate data for some years and microsimulation results for others, indicate an average supernormal share of 63 percent. Similar TPC calculations based on Flow of Funds data for 1995–2009 find a 62 percent share for supernormal returns. However, although supernormal returns generally accrue to shareholders, the corporate income tax provides a strong incentive to remove these returns from income subject to current U.S. corporate income tax, and corporations have responded to that incentive by moving these returns abroad.<sup>14</sup> So it is possible that the various estimates omit some supernormal returns on intangible assets because these assets have been transferred to foreign entities and returns on them are not included in the underlying U.S. corporate income tax data.

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<sup>11</sup> Corporate equity on average receives a higher return than bonds over most long historical periods (the equity premium), reflecting the relatively higher variability of corporate profits. As Auerbach (2006) notes, however, taxing risk premiums raises revenue but would not impose a net burden if the income tax allowed full loss offsets and only economic depreciation. While profits on average are higher due to this risk premium, the profits of some companies simply reflect unusually successful investments.

<sup>12</sup> An economic rent is the return an individual or a business receives from an activity in excess of what could be earned in alternatives. The sources of economic rents are diverse, including items such as the higher returns of unusually productive farmland or oil wells, the returns to scarce skills of top professional athletes, and the returns to companies with a unique product or exceptionally efficient and nonreplicable workforce.

<sup>13</sup> Harberger (1962) explored this issue through a modification of his basic model. Note that through capitalization, the burden on such supernormal returns may fall on initial investors rather than current shareholders.

<sup>14</sup> See Grubert (2012).

### *Mismeasurement of Income*

Taxable income as measured for corporate income tax purposes can deviate substantially from economic income. A major difference is in the measurement of depreciation of capital goods. Income tax depreciation schedules for plant and equipment are generally accelerated relative to economic depreciation. The cost of producing intangibles, such as research and advertising, is generally expensed for income tax purposes, rather than capitalized and recovered as the value of these assets declines. Other cost recovery rules, such as depletion allowances and certain methods of inventory accounting, are also accelerated relative to economic cost recovery. Accelerated cost recovery delays income tax payments, reducing the present value of taxes on the return to affected investments.

In addition to accelerated cost recovery rules, the corporate income tax provides credits for a percentage of the cost of certain capital goods (in particular, energy-related investments), and in the past allowed a more general investment tax credit. Investment tax credits also reduce the present value of income tax payments, by both increasing and accelerating the recovery of costs relative to economic depreciation.

Cost recovery and related income measurement rules affect the normal return to corporate equity but they generally do not affect supernormal returns. The incidence of the burden due to changes in these rules is therefore different from the incidence of the baseline burden of the corporate income tax or changes in rates or similar provisions that affect both normal and supernormal returns. Distributional analyses of corporate income tax changes must therefore distinguish between the effects of different changes in tax law.

### *Short Run versus Long Run*

In the short run, the incidence of any change in corporate income tax burdens is entirely on shareholders because any shifting of the burden (or benefit of a tax reduction) to other factors can only occur over time.<sup>15</sup> The immediate effect of the change will be capitalized into the value of shares, so shareholders cannot avoid the burden due to the change by selling their shares. Over time, however, an increase in the corporate income tax can lead to a shift in capital from the corporate to the noncorporate sector or overseas, driving up pretax returns on corporate capital and lowering pretax returns on capital in other sectors and possibly wages in the United States. The size and distribution of burden changes may also differ between the short run and the long run apart from changes in pretax corporate returns, either because provisions phase in (or out) over time, or because changes in cost recovery rules only apply to new investment and the existing stock (which remains subject to the prior rules) will not be replaced by new investment for an extended period of time.

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<sup>15</sup> A change in the taxation of labor income effected through corporate income tax provisions would burden labor (both in the long run and perhaps in the short run), but such changes would not be part of the provisions that define the corporate income tax, which are designed to tax returns to corporate (equity) capital and are not considered here.



## Plausible Range of Incidence Assumptions

The formalization of corporate income tax incidence analysis using general equilibrium models in Harberger (1962) initiated an extensive literature that has examined in depth alternative specifications and parameterizations of such models. With recent extensions to open economy versions and use of the latest econometric estimates of key parameters, Harberger-type models provide a plausible range of estimates for the incidence of the corporate income tax burden on the normal return to capital. In contrast, results from the recent empirical literature on corporate tax incidence have not been broadly confirmed, raise various econometric issues that are difficult to address satisfactorily, and in some cases appear to be implausible. For these reasons, the econometric studies do not appear to provide reliable guidance on the plausible range of incidence assumptions.

Based on our reading of the recent literature, TPC has combined a range of results from Harberger-type models with the range of estimates for the share of corporate income due to supernormal returns to develop a plausible range of long-run incidence assumptions for standard distributional analysis.<sup>16</sup> For labor's share, we used the range of 40 percent in Gravelle (2010) to 70 percent in Randolph (2006). For the share of corporate income due to supernormal returns, we used the range of 60 percent in TPC's calculations from Flow of Funds data to the roughly 70 percent implied by Toder and Rueben (2007). Combining these results requires an assumption about how much (if any) of the corporate income tax burden on supernormal returns is shifted from shareholders to other capital or to labor. TPC assumes that shareholders cannot shift any portion of this burden, so that it falls entirely on corporate equity.<sup>17</sup> Using this assumption, we can combine the ranges of results into a plausible range of assumptions about the share of the corporate tax burden borne by labor, by all (i.e., corporate and noncorporate) capital, and by corporate equity only.

The combined results give a range for labor's share of 12 to 28 percent, for all (corporate and noncorporate) capital's share of 9 percent to 24 percent, and for corporate equity's share of 60 to 70 percent (Table 1).

**Table 1**  
**Plausible Range of Long-Run Incidence Assumptions for the Corporate Income Tax**

Supernormal Return Share/ Labor Share of Normal Return	Return Shares (percent)				
	Total	Super-normal	Normal		
			Total	Labor	Capital
<b>Supernormal return share is low (60%) and:</b>					
Labor share of normal return is low (40%)	100	60	40	16	24
Labor share of normal return is high (70%)	100	60	40	28	12
<b>Supernormal return share is high (70%) and:</b>					
Labor share of normal return is low (40%)	100	70	30	12	18
Labor share of normal return is high (70%)	100	70	30	21	9

<sup>16</sup> Modification of these incidence assumptions necessary for short-run distributional analyses and for analysis of changes in cost recovery provisions is discussed below.

<sup>17</sup> As explained below, we temper this assumption by using the lowest value in the supernormal return share range.

How much using alternative assumptions in these ranges affects distributional results depends on three factors:

- The relative distributions across income classes of labor income, the normal return to all capital income, and corporate equity income;
- The relative share of corporate income tax burdens in total tax burdens included in the distributional analysis; and
- Whether the effect of changes in the corporate income tax are distributed in the same manner (i.e., using the same incidence assumptions) as the baseline corporate income tax burden.

The normal return to all capital income is more concentrated at higher income levels than labor income, and corporate equity income is generally more concentrated at higher income levels than the normal return to all capital income (Table 2). As a result, the corporate income tax distribution would be most progressive using the highest (70 percent) share for supernormal returns (corporate equity income only) and the lowest (40 percent) share of the normal return for labor. That combination assigns just 12 percent of the total burden of the corporate income tax to labor (column 4 in Table 2).

**Table 2**  
**Shares of Factor Incomes and the Corporate Income Tax Under the Most and Least Progressive and TPC's Updated Long-Run Incidence Assumptions, by Cash Income Percentile in 2015**

Cash Income Percentile	Income Shares			Corporate Income Tax Shares Under Alternative Incidence Assumptions		
	Labor	All Capital <sup>2</sup>	Corporate Equity	Most Progressive	Least Progressive	TPC's Updated
	(1)	(2)	(3)	(4)	(5)	(6)
<b>Lowest Quintile</b> <sup>1</sup>	3.5%	1.8%	0.6%	1.2%	1.6%	1.4%
<b>Second Quintile</b>	9.8%	3.6%	1.8%	3.1%	4.3%	3.8%
<b>Middle Quintile</b>	16.2%	4.8%	2.9%	4.8%	6.8%	5.9%
<b>Fourth Quintile</b>	22.5%	7.4%	5.7%	8.1%	10.6%	9.4%
<b>Top Quintile</b>	47.8%	81.5%	88.4%	82.3%	76.2%	78.9%
<b>All</b>	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
<b>Addendum</b>						
<b>80-90</b>	15.2%	5.2%	4.4%	5.8%	7.5%	6.7%
<b>90-95</b>	9.8%	6.1%	5.2%	5.9%	6.6%	6.3%
<b>95-99</b>	11.9%	15.4%	12.8%	13.1%	12.8%	13.1%
<b>Top 1 Percent</b>	10.9%	54.8%	66.1%	57.4%	49.3%	52.8%
<b>Top 0.1 Percent</b>	4.3%	30.0%	44.2%	36.8%	31.3%	33.4%

Source: TPC microsimulation model.

<sup>1</sup> Tax units with losses are excluded from the lowest quintile but included in the totals.

<sup>2</sup> Normal return only.

Conversely, the distribution would be least progressive using the lowest (60 percent) share for supernormal returns and highest (70 percent) share of the normal return for labor, giving labor 28 percent of the total burden (column 5 in Table 2). The share of the top quintile, for example, would be 82.3 percent under the most progressive assumptions, but not much less, 76.2 percent, under the least progressive.

### Updated TPC Incidence Assumptions

The plausible range of incidence assumptions from the recent literature indicates that the assumptions TPC previously adopted—that the entire corporate income tax burden falls on the total return to all capital, with no separate share on supernormal returns to corporate equity capital and no burden on labor—require updating.

TPC’s updated long-run incidence assumptions for the corporate income tax are that 60 percent of the burden falls on supernormal returns, 20 percent on labor income, and 20 percent on the normal return to all capital (Table 3). We assume the burden on supernormal returns falls only on shareholders (corporate equity only) and therefore selected the bottom of the plausible range to reflect the possibility that a portion may be shifted to other factors. We assume that labor bears 20 percent of the burden, the midpoint of the plausible range, making the residual share for the normal return to all capital also 20 percent. These shares imply that the corporate income tax burden on the normal return is split evenly between labor and capital. Adopting these rounded shares as TPC’s updated long-run assumptions produces distributional results that fall between the extremes of the plausible range but differ little from results that would be obtained using any set of shares within the range (compare columns 4, 5 and 6 of Table 2).

**Table 3**  
**TPC’s Updated Long-Run Incidence Assumptions for the Corporate Income Tax**

<b>Supernormal Return Share/ Labor Share of Normal Return</b>	<b>Return Shares (percent)</b>				
	<b>Total</b>	<b>Super- normal</b>	<b>Normal</b>		
			<b>Total</b>	<b>Labor</b>	<b>Capital</b>
<b>Supernormal return share is 60% and labor share of normal return is 50%</b>	100	60	40	20	20

The Treasury’s Office of Tax Analysis (OTA) recently updated its incidence assumptions for distributing the corporate income tax (Cronin, Lin, Power and Cooper 2012). The updated OTA assumptions are quite similar to TPC’s updated assumptions and fall well within the plausible range (Table 1). OTA assumes that a somewhat higher share of the burden falls on supernormal returns than TPC does (63 percent versus 60 percent). However, OTA estimates that about 1 percent of corporate income tax revenues represent repayments of “loans” due to expensing and accelerated depreciation provisions, rather than a burden on the normal return, and adjusts the normal return accordingly.<sup>18</sup> This adjustment reduces OTA’s estimated burden on the normal return to 36 percent, which it splits evenly between labor and capital. OTA’s resulting shares on both labor and all capital are therefore 18 percent (versus TPC’s 20 percent).

<sup>18</sup> TPC’s updated incidence assumptions do not include a comparable adjustment.

The Tax Analysis Division of CBO has also recently updated its incidence assumptions for distributing the corporate income tax (CBO 2012). CBO now distributes 75 percent of the corporate income tax burden to all capital income and 25 percent to labor. CBO does not distinguish normal and supernormal returns to capital, but these returns have similar distributions (Table 2) so the distinction does not have a significant effect on distributional results. Aside from the normal-supernormal distinction, CBO's updated assumptions are also well within the plausible range (Table 1).

### **Implementing TPC's Updated Incidence Assumptions**

Implementing TPC's updated corporate income tax incidence assumptions in its microsimulation model requires estimates of the corporate income tax burden and the distribution of corporate shareholders' part of that burden, as well as operational definitions of income from labor, corporate equity, and the normal return to all capital.

#### *Burden Measure*

For distributional analyses, the burden of the corporate income tax is generally measured by revenues. CBO projections of corporate income tax revenues are typically used to measure burdens under baseline law, while JCT or OTA revenue estimates are typically used to measure the burden of changes to baseline law. Using revenue as the measure of corporate income tax burden is consistent with the measure typically used in Harberger-type models, and revenue is usually the only measure available. However, measuring burden by revenue omits the excess burdens due to the reductions in economic efficiency that result from the corporate income tax. In addition, as discussed below, revenue estimates may include offsetting changes in individual income taxes that could affect the distribution somewhat, and in some circumstances revenue may not appropriately measure burden so an alternative measure is used.

Increases or reductions in corporate income tax liabilities will correspondingly decrease or increase after-tax corporate income, which will change dividend payments, the value of corporate stock, or both. Changes in dividends received or in realizations of gains on stock will in turn alter individual income tax liabilities in an opposite, offsetting direction to the corporate income tax change.<sup>19</sup> JCT and OTA estimators include these offsetting individual income tax effects as part of the corporate income tax estimate. Using JCT or OTA corporate income tax estimates results in TPC distributing these offsetting individual income tax effects in the same way it distributes the corporate income tax, instead of in proportion to changes in individual income taxes paid on income from dividends and gains on corporate stock.

Cost recovery provisions generally affect corporate tax revenues unevenly over multiple years, so the revenue change in any one year from a legislative revision to cost recovery rules does not properly reflect the annual change in tax burden. In place of annual revenue changes, TPC uses a real level annuity measure for the annual change in burden for long-run distributional analyses. This annuity has the same present value as the change in revenues over the life of the stock of covered assets in the long run (i.e., when all covered assets are subject to the changed cost

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<sup>19</sup> Over time, the change in the corporate income tax would be partially shifted to non-corporate capital and to labor, changing reported incomes and associated individual income tax liabilities for those other factors.

recovery rules), computed on the current level of the stock of covered assets. For short-run analyses, only the change in revenues from the current level of investment in covered assets is taken into account. When assets with varying useful lives are covered by a cost recovery provision, TPC computes the real level annuity separately for broad classes (defined by useful lives) of covered assets, and then sums the results for the analysis.<sup>20</sup>

A final issue in measuring burden is the effect of the corporate income tax on relative prices of consumer goods. These relative price effects have no net effect on the corporate tax burden, but change the burden across households to the extent households consume different direct and indirect shares of corporate and noncorporate goods. Such relative price effects are typically taken into account in distributing the burden of a VAT or other consumption-based tax.<sup>21</sup> The data required to compute the relative price effects of direct taxes on consumption are generally available from the Consumer Expenditure Survey conducted by the Bureau of Labor Statistics. No such data are generally available, however, for the *indirect* effects of the corporate income tax on consumer prices, and a significant effort would be required to develop estimates of such effects. Further, there is no reason to expect that the consumption share for goods and services produced in the corporate sector differs across income groups. For these reasons, measures of the corporate income tax burden typically do not take into account relative price effects. TPC's burden measure also omits these effects.

#### *Distributing the Share of the Burden that Falls on Corporate Shareholders*

Shareholders bear a large share of the corporate income tax burden under TPC's updated incidence assumptions—60 percent of the total due to the burden on supernormal returns plus much of the 20 percent of the total due to the capital income share of the burden on the normal return. Shareholders subject to individual income tax can be identified through their reporting of dividends or capital gains on stock on their tax returns, as described below. But not all shareholders are individuals, and a large share of individual holdings is held indirectly through defined contribution plans like 401(k)s and IRAs.<sup>22</sup> At the end of 2011, individuals directly held only a little over a third (34.3 percent) of the stock of domestic corporations, and indirectly another 30.0 percent (Table 4).<sup>23</sup> The remaining 35.7 percent was held primarily by defined benefit retirement plans (12.6 percent of the total) and the rest of the world (18.8 percent), with smaller holdings by nonprofits (3.4 percent) and the federal, state and local governments (0.8 percent). Auerbach (2006) discusses the difficulty of determining how households bear the burden of the corporate income tax attributable to stock held by nonprofits, defined benefit plans, or governments.

It is also unclear to what extent domestic households bear the burden of the tax attributable to holdings by the rest of the world. The holdings of domestic corporate stock by the rest of the world are roughly equal to the holdings of stock in nondomestic corporations by domestic

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<sup>20</sup> In practice, useful lives are based on tax rather than economic asset classes.

<sup>21</sup> See, for example, Toder, Nunns and Rosenberg (2011) and Cronin (1999).

<sup>22</sup> Mutual funds are also a form of indirect holdings but generally pass through dividends and capital gains to owners, who report the income for tax purposes.

<sup>23</sup> Table 4 nets out all ownership by other domestic corporations.

households.<sup>24</sup> Auerbach nets these holdings without discussing the incidence of the U.S. federal corporate income tax on them.

Distributional analyses prepared by academics, federal agencies, and TPC have generally not addressed the issue of stock ownership by entities other than households or the incidence of the corporate income tax on such owners. Instead, the entire corporate income tax burden has been attributed to the factor incomes of (domestic) households according to the incidence assumptions made for the analysis. Absent further guidance from the literature, TPC will continue to distribute the entire measured corporate income tax burden to U.S. households according to its updated incidence assumptions.

**Table 4**  
**Ownership of Stock in Domestic Corporations, 2011 (End of Year)**

Owner	Stock Holdings	
	Value (\$ billions)	Percent of Total
<b>Total</b>	<b>16,883</b>	<b>100.0%</b>
<b>Household sector, total</b>	10,862	64.3%
<b>Direct</b>	5,799	34.3%
<b>Indirect</b>	5,063	30.0%
<b>Mutual funds</b>	1,962	11.6%
<b>Life insurance</b>	1,139	6.7%
<b>Defined contribution plans</b>	1,962	11.6%
<b>Nonprofits</b>	579	3.4%
<b>Defined benefit plans</b>	2,134	12.6%
<b>Governments</b>	136	0.8%
<b>Rest of the World</b>	3,172	18.8%

Source: Board of Governors of the Federal Reserve System, *Flow of Funds Accounts for the United States* (March 12, 2012), Tables L.117, L.118.b, L.118.c, L.119, L.120, L.122, L.123, L.214, L.225, B.100, B.100.e and author's calculations.

### *Labor and Capital Income*

TPC distributes shares of the corporate income tax burden to sources of income by applying its updated incidence assumptions to the relevant labor and capital components of TPC's cash income measure.<sup>25</sup> Labor income for purposes of distributing the corporate income tax includes

<sup>24</sup> Compare Lines 3 and 6 of Table L.213 in Board of Governors of the Federal Reserve System (2012).

<sup>25</sup> Cash income is defined as AGI, less state and local tax refunds, plus: above-the-line deductions, nontaxable Social Security benefits, cash transfer payments, nontaxable pensions, tax-exempt interest, employee retirement contributions, the employer share of payroll taxes, and the corporate income tax. Capital income is defined as

wages, employee retirement contributions, distributions (excluding rollovers) from defined contribution plans and defined benefit plans, and the employer’s share of Social Security and Medicare taxes (i.e., FICA). Labor income also includes the labor component of self-employment and partnership income, assumed to be 80 percent of the SECA base.<sup>26</sup>

Capital income for purposes of distributing the corporate income tax includes returns to assets held directly and the capital component of self-employment and pass-through entity income. The various types of capital income must be split between normal and supernormal returns to implement the updated incidence assumptions (Table 5).

**Table 5**  
**Normal and Supernormal Shares of Capital Income by Source**  
**for Purposes of Distributing the Corporate Income Tax**

Income source	Capital Income Share That Is:	
	Normal	Supernormal
<b>Dividends<sup>1</sup></b>	40	60
<b>Capital gains on stocks<sup>2</sup></b>	40	60
<b>Capital share of earnings subject to SECA<sup>3</sup></b>	100	0
<b>Other self-employment and pass-through income</b>	40	N.A. <sup>4</sup>
<b>Capital gains on assets other than corporate stock</b>	40	N.A. <sup>4</sup>
<b>Supplemental gains</b>	100	0
<b>Taxable interest</b>	100	0
<b>Tax-exempt interest</b>	100	0

<sup>1</sup>Includes only “qualified” dividends; other income reported as dividends on tax returns is treated as taxable interest.

<sup>2</sup>Includes capital gains distributions from mutual funds and 70 percent of capital gains of pass-through entities (the assumed share of their gains from sales of corporate stock).

<sup>3</sup>Earnings subject to SECA are assumed to be 20 percent capital and 80 percent labor, based on NIPA aggregate returns to capital and labor in the corporate sector.

<sup>4</sup>These are non-corporate sources of capital income, for which the supernormal portion (60 percent) is assumed not to bear any corporate income tax.

### **TPC’s New Distribution of the Corporate Income Tax**

The corporate income tax is less progressive under TPC’s updated incidence assumptions than under the prior assumption: more of the burden falls on low- and middle-income households and less on high-income households (Table 6). For example, the middle quintile bears 5.9 percent of the burden under TPC’s updated incidence assumptions, compared with 4.0 percent under the prior incidence assumption, while the top quintile bears 78.9 percent, down from 85.4 percent (columns 1 and 2 of Table 6).

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qualified and nonqualified dividends, taxable and tax-exempt interest, capital gains, and the (positive) capital income component of self-employment and pass-through entity income.

<sup>26</sup> SECA is the Social Security and Medicare tax on self-employed individuals (including active partners in a partnership). The 80 percent figure is based on aggregate returns to capital and labor in the corporate sector from the National Income and Product Accounts (NIPA).

**Table 6**  
**Shares and Effective Tax Rates for Corporate Income Tax under Prior**  
**and Updated Incidence Assumptions, by Cash Income Percentile, 2015**

Cash Income Percentile	Prior Incidence Assumption <sup>1</sup>	Updated Incidence Assumptions <sup>2</sup>	Prior Incidence Assumption <sup>1</sup>	Updated Incidence Assumptions <sup>2</sup>
	(1)	(2)	(3)	(4)
	--- Shares of Burden ---		--- Effective Tax Rates ---	
<b>Lowest Quintile</b> <sup>3</sup>	0.9%	1.4%	0.7%	1.2%
<b>Second Quintile</b>	2.5%	3.8%	0.9%	1.3%
<b>Middle Quintile</b>	4.0%	5.9%	1.0%	1.4%
<b>Fourth Quintile</b>	6.2%	9.4%	1.1%	1.7%
<b>Top Quintile</b>	85.4%	78.9%	5.5%	5.2%
<b>All</b>	100.0%	100.0%	3.4%	3.4%
<b>Addendum</b>				
<b>80-90</b>	5.4%	6.7%	1.5%	1.8%
<b>90-95</b>	5.8%	6.3%	2.3%	2.5%
<b>95-99</b>	15.0%	13.1%	4.3%	3.8%
<b>Top 1 Percent</b>	59.3%	52.8%	10.3%	9.3%
<b>Top 0.1 Percent</b>	35.6%	33.4%	12.5%	11.9%

Source: TPC microsimulation model.

<sup>1</sup> The prior corporate incidence assumption is that 100% of the corporate income tax burden is borne by the total return to all capital income.

<sup>2</sup> The updated incidence assumptions are that 20% of the corporate income tax burden is borne by labor income, 20% by the normal return to all capital income and 60% by corporate equity income.

<sup>3</sup> Tax units with losses are excluded from the lowest quintile but included in the totals.

The reduction in progressivity of the corporate income tax due to the updated incidence assumptions can also be measured by effective corporate tax rates (columns 3 and 4 of Table 6). Effective rates are higher in the first four income quintiles and only lower in the fifth quintile. Within the fifth quintile, effective tax rates are higher for the 80th to 95th percentiles and lower for the top 5 percent, with the largest reduction for the top 1 percent for which the estimated effective rate falls from 10.3 percent to 9.3 percent.

### **Effect of Alternative Incidence Assumptions on the Distribution of the Federal Tax Burden**

Alternative assumptions about the incidence of the corporate income tax affect the distribution of the total federal tax burden (Table 7). Under TPC's updated incidence assumptions for standard long-run analyses, the total federal tax burden is 4.9 percent of income for the lowest quintile, 32.0 percent for the highest quintile, and 38.9 percent for the top 1 percent of tax units. Using the



**Table 7**  
**Effective Total Federal Tax Rates under Alternative Assumptions about**  
**Corporate Income Tax Incidence, by Cash Income Percentile, 2015**  
**(Current Law Baseline)**

Cash Income Percentile	Incidence Assumptions			
	Updated (Standard) <sup>1</sup>	In Plausible Range		Prior <sup>4</sup>
		Most Progressive <sup>2</sup>	Least Progressive <sup>3</sup>	
--- Effective Tax Rates ---				
<b>Lowest Quintile<sup>5</sup></b>	4.9%	4.7%	5.1%	4.6%
<b>Second Quintile</b>	13.0%	12.8%	13.2%	12.7%
<b>Middle Quintile</b>	18.6%	18.3%	18.8%	18.2%
<b>Fourth Quintile</b>	22.3%	22.0%	22.5%	21.9%
<b>Top Quintile</b>	32.0%	32.2%	31.8%	32.2%
<b>All</b>	25.4%	25.4%	25.4%	25.4%
<b>Addendum</b>				
<b>80-90</b>	25.7%	25.4%	25.9%	25.3%
<b>90-95</b>	27.2%	27.0%	27.3%	26.9%
<b>95-99</b>	30.8%	30.8%	30.7%	31.2%
<b>Top 1 Percent</b>	38.9%	39.7%	38.3%	39.5%
<b>Top 0.1 Percent</b>	40.8%	42.0%	40.0%	41.1%

Source: TPC microsimulation model.

<sup>1</sup> Under the updated incidence assumptions for long-run (standard) distributions of the baseline corporate income tax burden or the burden of rate and similar changes, 20% is distributed to labor income, 20% to the normal return to all capital income and 60% to corporate equity income.

<sup>2</sup> Under the most progressive incidence assumptions in the plausible range, 12% of the (long-run) corporate income tax burden is distributed to labor income, 18% to the normal return to all capital income and 70% to corporate equity income.

<sup>3</sup> Under the least progressive incidence assumptions in the plausible range, 28% of the (long-run) corporate income tax burden is distributed to labor income, 12% to the normal return to all capital income and 60% to corporate equity income.

<sup>4</sup> Under the prior incidence assumption, all of the (long-run) corporate income tax burden is distributed to the total return to all capital income. Because cash income includes the (baseline) corporate income tax burden, the distribution of cash income is slightly different under the prior and updated incidence assumptions.

<sup>5</sup> Tax units with losses are excluded from the lowest quintile but included in the totals.

most and least progressive corporate income tax incidence assumptions within the plausible range (second and third columns of Table 7) would have only a modest effect on the measured total federal tax burden. For example, the burden on the highest quintile would only vary between 32.2 percent under the most progressive incidence assumptions and 31.8 under the least progressive.

Using TPC's prior incidence assumption that the entire corporate income tax burden falls on the total return to all capital income would make the corporate income tax slightly more progressive than under TPC's updated incidence assumptions (last column of Table 7).<sup>27</sup> However, differences are generally not large. For example, the effective tax rate in the highest quintile is only slightly higher under the prior incidence assumption (32.2 percent versus 32.0 percent). The difference for the top 1 percent is the largest (39.5 percent versus 38.9 percent).

### **Incidence and Distribution of Corporate Income Tax Changes**

The discussion in the preceding sections focused on how the updated incidence assumptions for "standard" long-run analyses affected the distribution of the corporate income tax and total federal taxes. These "standard" incidence assumptions apply for distributing the baseline corporate income tax burden. These assumptions also apply for distributing the long-run change in burdens due to changes in the corporate income tax rate or changes in the tax base that affect both normal and supernormal returns. But, as discussed above, changes in cost recovery provisions affect only the normal return and so in the long run would be distributed according to the updated assumption for the incidence on the normal return—50 percent to labor income and 50 percent to the normal return to all capital income.

In the short run, the entire incidence of the burden of any change in the corporate income tax is on shareholders (corporate equity income). As noted above, however, the size of the short-run change in burden (or benefit of a reduction in tax) may be quite different from the change in long-run burden (or benefit). The difference can arise either because the change is phased in (or out) over time or because a change in cost recovery rules applies only to new investment.

The distribution of the corporate income tax burden is more progressive in the short run than in the long run and more progressive in the long run for changes in rates than for changes in cost recovery provisions (Table 8). For example, the highest quintile bears 88.4 percent of changes in burden in the short run, 78.9 percent of the burden in standard long-run distributions, and 64.6 percent of changes in the long-run burden due to changes in cost recovery provisions.

### **Conclusions**

TPC's updated methodology for distributing the corporate income tax reduces the measured progressivity of the tax, primarily because it assumes that some of the burden falls on labor income, rather than only on capital income as previously assumed. However, the corporate income tax remains a very progressive component of the federal tax system, and because the corporate income tax represents a relatively small share of total federal taxes, the reduced

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<sup>27</sup> Note that the distribution of cash income, which includes the (baseline) corporate income tax burden, is slightly different under the two sets of incidence assumptions.

**Table 8**  
**Distribution of Changes in the Corporate Income Tax Burden: Long-Run Changes in Rates or in Cost Recovery Provisions and All Short-Run Changes, by Cash Income Percentiles, 2015**

Cash Income Percentile	Long-Run Burden		Short-Run Changes in Burden <sup>3</sup>
	Rate Change <sup>1</sup>	Change in Cost Recovery Provisions <sup>2</sup>	
<i>--- Shares of Corporate Income Tax Burden ---</i>			
<b>Lowest Quintile<sup>4</sup></b>	1.4%	2.7%	0.6%
<b>Second Quintile</b>	3.8%	6.7%	1.8%
<b>Middle Quintile</b>	5.9%	10.5%	2.9%
<b>Fourth Quintile</b>	9.4%	15.0%	5.7%
<b>Top Quintile</b>	78.9%	64.6%	88.4%
<b>All</b>	100.0%	100.0%	100.0%
<b>Addendum</b>			
<b>80-90</b>	6.7%	10.2%	4.4%
<b>90-95</b>	6.3%	7.9%	5.2%
<b>95-99</b>	13.1%	13.6%	12.8%
<b>Top 1 Percent</b>	52.8%	32.8%	66.1%
<b>Top 0.1 Percent</b>	33.4%	17.1%	44.2%

Source: TPC microsimulation model.

<sup>1</sup> Standard long-run distribution for the baseline corporate income tax burden under the updated incidence assumptions (column 2 of Table 6).

<sup>2</sup> Corporate income tax burden on the normal return (50% labor and 50% all capital) under the updated incidence assumptions (computed from columns 1 and 2 of Table 2).

<sup>3</sup> Corporate income tax burden on supernormal returns (corporate equity under the updated incidence assumptions, column 3 of Table 2).

<sup>4</sup> Tax units with losses are excluded from the lowest quintile but included in the totals.

estimate of the progressivity of the corporate income tax has only a modest effect on the estimated progressivity of the total federal tax system.

TPC's updated methodology also applies different incidence assumptions, depending on the nature of changes in the corporate income tax and whether short-run or long-run effects are being analyzed. Corporate tax increases through changes in cost recovery provisions only affect the normal return to capital and have different, less progressive effects on the distribution than the baseline amount of corporate income tax or changes that also affect supernormal returns, such as changes in statutory tax rates. In the short run, the entire burden of a corporate income tax change falls on shareholders and therefore increases in the corporate income tax impose higher burdens on the very top incomes in the short run than in the long run.

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