THE INCOME AND PAYROLL TAX OFFSET
TO CHANGES IN EXCISE TAX REVENUES

Prepared by the Staff
of the
JOINT COMMITTEE ON TAXATION

CONTENTS

INTRODUCTION AND SUMMARY

This document[1] describes the economic modeling that the Joint Committee on Taxation staff ("Joint Committee staff") undertakes to assess the revenue effects of the income and payroll tax offset that arises from changes in Federal excise taxes.[2]

A revenue estimate by the Joint Committee staff compares estimated future Federal receipts expected to result from the enactment of a proposed change to the Internal Revenue Code against estimated future Federal receipts under present law. Joint Committee staff estimates use the Congressional Budget Office ("CBO") ten-year macroeconomic revenue baseline as a starting point for estimates. Under relevant budget rules, the Joint Committee staff estimates compare estimated receipts over the ten-year budget period to baseline receipts.

In preparing every revenue estimate, the Joint Committee staff employs an interdisciplinary approach, with input from staff economists, attorneys, and accountants in order to identify economic incentives faced by taxpayers as a result of the proposed change in law. The Joint Committee staff then considers taxpayers' likely behavioral responses to the new tax environment in light of those incentives. This exercise of predicting behavioral responses to new tax legislation is often the most challenging and time-consuming aspect of preparing a revenue estimate.

In addition to considering economic incentives, the Joint Committee staff refines the CBO revenue baseline to create a more detailed revenue baseline for the present law tax provision in question. The baseline estimates of both CBO and the Joint Committee staff reflect long-term economic, social, and population trends, to the extent those trends will affect tax revenues.

In estimating the revenue effects of changes in excise taxes, the Joint Committee staff generally assumes that the net effect on total Federal tax receipts from an increase in Federal excise taxes is less than the increase in gross excise tax receipts. The difference arises because an increase in excise taxes results in a decrease in income subject to Federal income and payroll taxation. Conversely, a decrease in excise taxes results in an increase in Federal income and payroll tax. This interaction between excise tax receipts and total Federal tax receipts is referred to as the "income and payroll tax offset." Historically, the Joint Committee staff has assumed an income and payroll tax offset of 25 percent.

This document updates the calculation of the income and payroll tax offset, and presents values of the offset which the Joint Committee staff will employ as part of present-law baseline modeling commencing in 2012.

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[1] This document may be cited as follows: Joint Committee on Taxation, *The Income and Payroll Tax Offset to Changes in Excise Tax Revenues* (JCX-59-11), December 23, 2011. This document can also be found on our website at www.jct.gov.

[2] We welcome comments from interested readers who have studied the effects of excise taxes on specific markets or the macro economy.

I. MODELING APPROACH

In estimating the revenue effects of changes in excise taxes, the Joint Committee staff (along with staff at the Congressional Budget Office and the Department of the Treasury's Office of Tax Analysis ("OTA")) generally assumes that the net effect on total Federal tax receipts from an increase in Federal excise taxes is less than the increase in gross excise tax receipts. The difference between the change in excise tax receipts and the change in total Federal tax receipts is referred to as the "income and payroll tax offset." The offset arises from the fact that an increase in excise taxes results in a decrease in income subject to Federal income and payroll taxation.

There are several channels through which the imposition of an excise tax can affect taxable income. Consider the case of a producers that are entirely insensitive to the imposition of an excise tax on the produced product (*i.e.*, supply is perfectly inelastic). In this case, the producers of the taxed product absorb the entire cost of the tax. If supply of the taxed product is perfectly inelastic,[3] thus forcing producers of the taxed product to absorb the entire cost of the tax, the gross receipts of the producers remain unchanged, but the producers' net receipts, after deduction of the excise tax, decline by the amount of excise tax collected. This decline in receipts for producers of the taxed good is allocated among profits and wages depending on market forces and produces some combination of a decline in wages and profits, which will reduce the payroll and the individual and corporate income tax bases.

If, at the opposite behavioral extreme, demand for the taxed product is perfectly inelastic, consumers bear the entire tax. The producers of the taxed good take in more revenue per unit of sale, but deduct the excise tax as a cost of doing business, leaving net revenue per unit sold unchanged and the taxable income of the producers of the taxed good unchanged. In this case, however, the consumer will have less money to spend on other goods, consumer spending on non-taxed goods will decline, thus lowering the taxable income of the producers of the non-taxed goods. Again, this change in consumption results in a reduction of payroll taxes and corporate and individual income taxes in the affected industries.

Of course, for most taxed products, it is likely that neither of these two extreme cases would occur. Instead, the reduction in taxable income results from some combination of reduced taxable income in the taxed and non-taxed sectors.

Consistent with the general revenue estimating convention that holds nominal gross national product ("GNP") fixed for revenue estimating purposes, the above discussion implicitly assumes that aggregate price and output levels are unaffected by changes in excise taxes. Under this assumption, in the extreme case in which the taxed producers bear the entire cost of the tax increase, the before-tax price falls by the full amount of the tax. In the case in which consumers bear the entire tax, the price of the taxed good rises by the full amount of the tax, and the prices of non-taxed goods fall such that the nominal price level remains unchanged, thus reducing taxable income in the non-taxed sectors. In the two polar cases, and those in between, the

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[3] Elasticity is a measurement of the percentage change in supply or demand given a percentage change in price. Inelastic supply indicates that there is very little change in the supply of the good given changes in the price. For a consumer, inelastic demand indicates that the consumer does not change their demand for the good with a change in price.

mechanism driving the income and payroll tax offset produced by excise taxes is that these taxes drive a wedge between income generated by the factors of production (*i.e.*, labor and capital used to produce goods and services) and the taxable incomes attributable to these factors ("factor incomes").

There are a few instances in which the income and payroll tax offset might not apply, or instances in which its impact might be reduced. There may be effects on Federal outlays that need to be considered. For example, in the case of the imposition of a large sales tax broadly affecting the economy, income attributable to factors of production for the entire economy would likely experience a decline to maintain the fixed nominal price level. Assuming that Federal government purchases are not fixed in nominal terms, then the Federal government's purchase of factors of production would decline as well. These reductions in payments would largely eliminate the income and payroll tax offset, as illustrated below.[4]

Consider a sales tax that raises $1 trillion imposed on a $20 trillion economy. Further assume that the Federal government expenditures are initially $4 trillion, or 20 percent of the economy. Income attributable to factors of production would decline by $1 trillion, or 6.25 percent.[5] Assuming a 25 percent income and payroll tax offset,[6] this would result in a decline in income and payroll tax receipts of $250 billion resulting in net tax receipts increasing by $750 billion. However, since the price level has declined by 6.25 percent, the Federal government can purchase the same goods and services for 6.25 percent less. As a result, Federal expenditures would be $3.75 trillion, or $250 billion less than the initially assumed $4 trillion. The proper budget effect of this proposal would include the net effect on the deficit and would be a reduction of the deficit by the full $1 trillion (equal to the $750 billion after the offset plus the $250 billion expenditure savings). More careful scrutiny of this issue is important in the context of analyzing broad-ranging tax reform proposals that replace income taxes with consumption taxes.[7] In general, for this type of proposal, the Joint Committee staff has not used an income and payroll tax offset on the replacement of income taxes with consumption taxes.

As another example, consider a proposal which raises revenues from an excise tax, but rebates all of the revenues back to individuals as taxable income. In this case, assuming that the rebate is not income limited, an income and payroll tax offset should not be applied because taxable income remains constant.[8]

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[4] How much of the offset would remain depends on the difference between Federal government expenditures as a percentage of gross domestic product ("GDP") and the offset percentage.

[5] 6.25 percent is equal to the $1 trillion in revenue raised divided by GDP less the Federal government expenditures, assuming that the Federal government doesn't pay the tax.

[6] The 25-percent assumption is discussed in more detail below.

[7] The neutrality of Federal government expenditures with respect to price changes or income replacement may be affected by the extent of indexation or taxation of government transfer payments.

[8] See Congressional Budget Office, "The Role of the 25 Percent Revenue Offset in Estimating the Budgetary Effects of Legislation," *Economic and Budget Issue Brief*, January 13, 2009, pp. 1-8.

Finally, consider an excise tax from which the Federal government is not exempt, and the Federal government purchases a large portion of the good. That is, the Federal government is a taxpayer of this tax. For example, the Federal government purchases approximately half of the vaccines that are subject to the vaccine excise tax. Because the Federal government pays for the vaccines after the imposition of the tax, the income and payroll tax offset should be reduced by about half to reflect the increased expenditures by the Federal government on vaccines. Suppose that Congress imposes a new vaccine excise tax that raises $1 in gross revenues. Further, suppose that the Federal government purchases 50 percent of the vaccine. Therefore the Federal government pays $0.50 to itself, for revenues net of the Federal government purchase of $0.50. However, the income and payroll tax offset on the $0.50 still needs to be taken into account; net revenues would be $0.375 after applying a 25 percent offset to the $0.50 of excise tax receipts from non-Federal government sources.

II. MEASURING THE OFFSET

The income and payroll tax offset is estimated by the share of incomes attributable to each productive factor in the economy ("factor incomes"), the percentage of factor income that is taxable, and the applicable marginal tax rate. For many years, the Joint Committee staff, as well as OTA and the CBO, have assumed that the income and payroll tax offset is 25 percent of the gross excise tax effect. Initially OTA used an offset of 30 percent in the early 1970s in estimating the revenue effects of a proposed windfall profits excise tax on sales of crude oil. In 1978, OTA economists described the rationale for an income and payroll tax offset and then estimated what it would be for a hypothetical $32 billion excise tax.[9] Assuming that the changes to income resulting from the excise tax are proportional to the distribution of income, they estimated that the offset should be about 35 percent.

A 1988 study recomputed the income and payroll tax offset to account for the reduction in marginal income tax rates resulting from the Tax Reform Act of 1986 and to incorporate the effects of payroll taxes.[10] This analysis estimated that a change in gross excise tax revenues would be accompanied by an income tax offset of 17 percent and a payroll tax offset of 7 percent, for a total offset of 24 percent.

Table 1 below presents an income and payroll tax offset estimate using 2007 factor incomes and Federal tax rates. The first column presents the National Income and Product Account ("NIPA") income amounts for factor incomes for 2007 in billions. The NIPA corporate profits income definition includes income from S corporations which generate pass-through income, and has adjustments for a number of income items including State and local taxes.[11] The second column shows the percentage contribution to total factor incomes of each of the separate items. Sixty-eight percent of total factor income is attributable to compensation of employees.[12] The third and fourth columns show the amounts and the percentage of factor income reported to Internal Revenue Service that is taxable.[13] The Joint Committee staff separates employee compensation into the amount taxable under the income tax and under the FICA, OASDI and HI payroll tax. The largest difference between these two tax bases is the taxation of elective contributions to tax deferred retirement savings plans, such as plans under section 401(k), which are taxable for purposes of computing FICA tax, but not for Federal income tax. Because S

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[9] George Tolley and C. Eugene Steuerle, "The Effects of Excises on the Taxation and Measurement of Income," *Compendium of Tax Research*, Government Printing Office, 1978, pp. 67 - 78.

[10] Sonia Conly and Linda Radey, "Changes in Excise and Payroll Taxes and Their Effects on Total Budget Receipts," presentation at the Eastern Economic Association Meetings, March 10-12, 1988.

[11] See Table 7.16, Bureau of Economic Analysis, "Relation of Corporate Profits, Taxes, and Dividends in National Income and Product Accounts to Corresponding Measures as Published by the Internal Revenue Service," available at http://www.bea.gov/national/nipaweb/Index.asp.

[12] In 1988, Conly and Radey reported that 73 percent of factor income was attributable to compensation of employees in 1985.

[13] Taxable income amounts are generally from Internal Revenue Service, *Statistics of Income--2007 Individual Income Tax Returns*, and Internal Revenue Service, *Statistics of Income -- 2007 Corporation Income Tax Returns*, 2010.

corporations pass through their income to shareholders, the profits attributable to them are taxed at the individual level. Therefore the Joint Committee staff has subtracted $287.2 billion of S corporation profits from the corporate profits line (both the NIPA column and the Taxable Column) and added these profits into the business income line for the NIPA column.[14] These profits are treated as business income taxable to individuals.[15] The fifth column is the average marginal tax rate for each of the income types. The corporate income tax rate is calculated as a 25.1 percent corporate rate plus an additional 5.2 percent accounting for the taxation of dividends and capital gains at the individual level.[16] Finally, the sixth column presents the weighted marginal tax rate contribution to the overall offset. The 24.6 percent number in the last row of the last column is the total estimated income and payroll tax offset for 2007.

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[14] See Table 7, Internal Revenue Service, *Statistics of Income -- 2007 Corporation Income Tax Returns*, 2010, p. 242.

[15] The table reports that 103 percent of NIPA corporate profits are taxable. NIPA amounts for corporations start with the IRS reported amount of $1,788.7 billion in receipts less deductions. Then the Bureau of Economic Analysis adjusts this amount for a number of items, including adding in misreported items, the Federal Reserve banks, State and local taxes, and subtracting out items including capital gains from the sale of property, dividends and income from domestic and foreign corporations. The net result is that in 2007 the NIPA amount of $1,738.4 billion is slightly smaller than the IRS reported number. The amount reported in Table 1 ($1,451.2) is the NIPA $1,738.4 less the $287.2 in passthrough income.

[16] The 25.1 percent corporate rate is the average rate reported in Bureau of Economic Analysis Table 7.16. The corporate rate structure is essentially flat; consequently we have assumed that the marginal and average tax rates are equal. The additional 5.2 percent is 1.6 percent dividends tax plus a 3.6 percent capital gains tax, where the marginal tax rate at the individual level on dividends and capital gains is 15.1 percent and 16.1 percent applied to the taxable portion of corporate profits that show up as qualified dividends and capital gains, respectively. The tax rates on dividends and capital gains are determined from the Joint Committee staff individual tax model. For capital gains for this purpose the Joint Committee staff has ignored effects on receipts in future years and from non-corporate capital assets.

Table 1. Calculation of the Income and Payroll Excise Tax Offset for 2007

	NIPA Income	Percent of Total	Taxable Income	Percent of NIPA Income	Marginal Tax Rate (MTR)	Weighted MTR = b*d*e
	(a)	(b)	(c)	(d)	(e)	(f)
Compensation of Employees………………	7,855.9	0.680				
Income Tax………			5,910.5	0.752	0.226	0.116
FICA Tax………...			6,081.7	0.774	0.118	0.062
Business and Rental Income………………….	1,483.5	0.128	729.1	0.492	0.373	0.024
Farm Income…………….	37.8	0.003	-14.8	-0.390	0.199	0.000
Interest Income…………..	731.6	0.063	270.8	0.370	0.246	0.006
Corporate Profits before Inventory and Capital Consumption Adjustment..	1,451.2	0.126	1,501.5	1.035	0.303	0.039
Total Factor Incomes…	**11,560.0**	**1.000**	**8,568**	**0.741**		**0.246**

Implicit in the 24.6 percent estimate of total factor incomes for 2007 is the assumption that the factors of production bear the incidence of the change according to their contribution to total income. Alternatively, one could argue that either labor or capital is more likely to bear the burden of the changes. One could argue that, in an open economy, capital can move freely across borders and seek out the best rate of return, and thus employees will bear the burden. In this case, the income and payroll tax offset is simply computed with respect to the tax rate and amount of taxable income earned by employees. Under this assumption, the income and payroll tax offset would be 26.1 percent.[17] If, at the other extreme wages do not adjust and capital bears the burden of an increase in an excise tax, then the estimated income and payroll tax offset would be 21.4 percent.[18]

An exact calculation of the magnitude of the income and payroll tax offset would require determining the exact incidence for each excise tax and applying the appropriate marginal income tax rates to the reductions in factor incomes. For example, the appropriate income and payroll tax offset rate to apply to a change in the tobacco tax could vary substantially depending on whether the burden of the tax is assumed to fall on tobacco farmers, tobacco processors, or smokers. Determining the incidence of the tobacco tax, however, is problematic in an industry in which the market structure for processors is oligopolistic (*i.e.*, a market that is shared by a small

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[17] From the table this is calculated by summing the income and FICA tax pieces; 26.1 = (0.752*22.6) + (0.774*11.8).

[18] 21.4 percent is calculated by zeroing out the compensation of employees and recalculating the percent of income owing to each remaining category and proceeding as before. Thus, the percent owing to corporate profits would increase from 12.6 percent to 39.2 percent, and the net weighted marginal tax rate for corporate profits comparable to that reported in column (f) would be 12.3 percent (= 0.39*1.035*0.303), instead of 3.9 percent.

number of producers or sellers with limited competition); the elasticity of demand among consumers is arguably separable into a highly inelastic segment for existing smokers and a higher price elasticity of demand among new smokers. Further complicating such analysis, different Federal excise tax rates apply to different tobacco products and tobacco is subject to a significant variation in State excise tax rates. In the case of the gasoline excise tax, an additional challenge in determining incidence is posed by the fact that gasoline is both an intermediate good and a final consumption item. Even if both tobacco and gasoline taxes were assumed to be ultimately paid by final consumers of each product, it is probable that the consumption patterns for substitute goods for the two sets of consumers would be different, thus generating different income and payroll tax offsets for the two products.

Rather than trying to derive separate offsets for each excise tax based on conjectures about the incidence of tax under each tax proposal, revenue estimating staffs have settled on using a standard offset factor of 25 percent for most excise tax estimates. This factor may be thought of as a marginal tax rate on factors of production. As shown in the table above, if it is assumed that increases in profits were shared among the factors of production according to their contribution to total income, then the Federal marginal tax rate in 2007 was 24.6 percent. Because excise taxes reduce income attributable to the factors of production, this marginal tax rate indicates the income and payroll tax revenue *loss*, or offset, for each additional dollar of excise tax revenue raised.

III. FORECASTING THE OFFSET

The analysis above shows that for calendar year 2007 the offset was indeed very close to the standard offset factor of 25 percent. However, many tax reductions enacted in 2001 and 2003 are set to expire at the end of 2012. With the expiration of these tax cuts, the marginal rates applicable for different factors of production will increase and 25 percent may be an underestimate of the appropriate income and payroll tax offset.

Table 2 below shows two different series of income and payroll tax offsets for the period 2011-2021. The first row calculates the offset by simply adjusting the marginal tax rates to be consistent with present law for each year. The adjusted marginal individual income and payroll tax rates are calculated using the Joint Committee staff's individual tax model. The corporate rate is held constant at the 2007 rate. In addition to adjusting the tax rates, the second row also adjusts the NIPA income forecasts and the taxable portion.[19] As can be seen from the table, adjusting the income and payroll tax offset for the changes in the tax rates raises the offset from approximately 25 percent in 2007 to 29 percent in 2021.[20] Including adjustments, the offset is smaller in each year until 2018 than in row one, reflecting lower taxable portions of income. After 2017, the Joint Committee staff's forecast of taxable income rises as a result of the imposition of the excise tax on certain high premium health insurance plans (section 4980I of the Internal Revenue Code).

Table 2. Forecasting the Income and Payroll Tax Offset

Item	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Offsets Adjusting Marginal Tax Rates………….	0.239	0.258	0.277	0.281	0.283	0.287	0.288	0.290	0.291	0.292	0.294
Offsets Adjusting Marginal Tax Rates and Taxable Percentages……	0.233	0.252	0.271	0.276	0.280	0.285	0.287	0.292	0.294	0.296	0.299

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[19] For the second calculation, other than the corporate calculation, the NIPA forecasts are from CBO, and the taxable portions are from the Joint Committee staff individual income tax model. The corporate taxable portion is held constant at the 2007 level.

[20] The lower rate in 2011 reflects the effects of the temporary two percentage point payroll tax reduction. However, the analysis summarized in Table 2 is based upon the temporary two percentage point payroll tax reduction expiring after 2011.

IV. IMPLEMENTING THE OFFSET FOR FUTURE BUDGET PERIODS

Beginning in January of 2012, the Joint Committee staff intends to use income and payroll tax offsets for excise taxes that reflect present-law tax rates and baseline macroeconomic projections and that are adjusted for the taxable percentage similar to those in the second row of Table 2 above. These calculations will be made subsequent to the release of the CBO's 2012 baseline. Table 3 below illustrates the calculation of the offset applying assumptions in effect in 2011.

Table 3. Income and Payroll Tax Offsets Under Present Law Baseline 2012 Through 2021

Item	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Offsets Adjusting Marginal Tax Rates and Taxable Percentages………	0.252	0.271	0.276	0.280	0.285	0.287	0.292	0.294	0.296	0.299