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The Flat Tax and Other Proposals: Who Will Bear the Tax Burden?

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SUMMARY

Several proposals for major reform of the Federal income tax system, including replacement of the current tax with a new type of tax, have been introduced or considered in the 104th Congress. These proposals include national sales and value added taxes, the Armey flat tax, and the Nunn-Domenici-Kerrey USA tax. Representative Gephardt has proposed a major reform of the income tax. These proposals alter the tax base, the rate structure, and the point of collection of taxes in ways that have important economic implications.

The Armey flat tax, although often discussed as if it were an income tax, is, like the value added and national sales tax, imposed on consumption. The USA tax, billed as a consumption tax, may actually be closer to a wage tax.

Consumption taxes can be characterized as a tax on old capital and wages. This tax burden may be passed on to owners of old capital and wages in a variety of ways. For indirect taxes such as sales and value added taxes imposed on businesses, which would need price accommodation to avoid an economic contraction, this burden is imposed because of reduced purchasing power of wages and assets, due to higher prices of consumption goods. For a direct consumption tax, as envisioned as a major part of the USA tax, the taxes are imposed directly.

For the Armey flat tax, however, the tax is split, with the wage tax largely collected directly from individuals and the tax on old capital from firms. This unique combination suggests that there will be no need to accommodate the tax with prices, but also implies that stock market values should fall and that the burden on old debt (which cannot be altered) will also fall on equities as well. If the flat tax rate is about of 20 percent, the stock market should fall by about 30 percent. Some stock values will fall more than others depending on debt shares. (Such effects would also be expected if no price accommodations were made to a VAT or sales tax; wages would fall as well). If these effects do not occur, the savings effects expected, in theory, from consumption taxation cannot occur.

The USA tax has elements of all three taxes: a small traditional VAT, a collection of a tax on old capital from firms, and a direct consumption tax. Because of its extensive transition rules, however, the tax base deviates substantially from a consumption tax base, and moves in the direction of a wage tax base. Its direct effects on the stock market should be smaller than the flat tax, but uneven.

A consumption tax tends to fall, relative to an income tax, more heavily on individuals who are old and are consuming their assets; statistical data also suggests that it tends to fall more heavily on lower income individuals. A number of other factors affect these distributional consequences. A consumption tax should, in theory, increase savings, but it is not clear from empirical evidence how much of an effect would occur. Much of this savings effect would be undermined under the transitional rules of the USA tax, or if the predicted changes in stock market values do not occur in the flat tax.

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INTRODUCTION

Several proposals for major reform of the Federal income tax system, including replacement of the current tax with a new type of tax, have been introduced or considered in the 104th Congress.[1]

Straightforward consumption taxes, including a *value added tax* or a *retail sales tax* have been proposed or discussed. Retail sales taxes, now commonly used as revenue sources by the States, would impose a tax on products at the final stage of consumption. Senator Lugar has proposed a national sales tax.

An alternative to the retail sales tax is the value added tax, or VAT. The VAT, in theory, is the same as the sales tax, except that it is collected at each stage of production. It is termed a value-added tax because the tax base for any given firm is receipts minus purchases from other businesses, or value added. Two forms of VAT are commonly discussed: the European style VAT where firms pay the tax and take a credit for tax on purchases, and a subtraction-method VAT (also sometimes referred to as a business transfer tax), where the cost of purchases from other businesses is deducted from the base before applying the tax.

This latter form of VAT has been proposed by Representative Gibbons; such a VAT was also proposed in the previous Congress by Senators Boren and Danforth.

Also under discussion is the Nunn-Domenici-Kerrey proposal for a combined direct consumption tax (with graduated rates) on individuals and a VAT on firms (S. 722), called the *USA tax* (for unlimited savings account). The direct consumption tax imposes the tax on income used by individuals for consumption purposes, rather than on the products, but has the same effect as an indirect products tax. The USA tax is modified in a number of ways, however, through a series of transition rules that allow firms and individuals to recover the basis of existing assets, in some cases, and by other rules which cause the proposal to differ substantially from a pure consumption tax. The USA tax substitutes for both the income tax and the employer's share of the payroll tax.

The *flat tax* proposal advanced by Representative Armey (and introduced as H.R. 2060, with a companion bill, S. 1050, introduced by Senator Shelby and a similar bill, S. 488 introduced by Senator Specter) is one of the most frequently discussed. The flat tax would be imposed on wage income of individuals and in the form of a modified VAT on firms, where wages would be deducted from the base. Thus, the firm tax would be imposed on business receipts minus purchases, including capital goods, and wages paid. The basic idea for this type of tax was

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[1] See Flat Tax Proposals: An Overview. Congressional Research Service Issue Brief IB95060, by James M. Bickley for more detail on the features of these tax proposals.

developed by Robert Hall and Alvin Rabushka, and the tax is also sometimes referred to as the Hall-Rabushka tax. There is an exemption from the wage tax portion, so that the effective tax rate is graduated on wages.

Finally, Representative Gephardt has proposed a significant revision of the current income tax, through broadening the base and lowering the rates, while maintaining graduated rates.

These proposals have been motivated by a variety of reasons: among them, simplifying tax administration and compliance, and increasing savings and economic efficiency. Distributional issues have been an important concern as well, along with the consequences of the transition to a major new tax system, which will inevitably produce winners and losers among different firms. Before the distributional or incentive consequences of proposals can be fully understood, however, it is important to understand how tax burdens are being altered with these tax proposals.

Taxes can be imposed on different bases -- in particular, on income, consumption, or wages. They can also be flat or graduated. They can be imposed either on products (to be paid by firms), firms, or individuals. All of these aspects of a tax revision may have some implications for the burden -- and therefore the incentive and distributional effects -- of tax changes.

In some cases, the nature of the tax being proposed is not transparent, and in all cases, the way in which different types of taxes shift the tax burden may not be clear. The remainder of this paper identifies the basic nature of these tax proposals and the consequences for the tax burden.

The first section of the paper identifies the type of tax -- income, consumption, or wage -- to be imposed by each proposal, based on identifying national aggregates. The following sections explains how the different tax types -- even though their aggregate tax bases may seem similar -- shift the burden among individuals. The final section presents a brief overview of the economic consequences of these proposals, including effects on distribution, savings, economic efficiency.

WHAT KIND OF TAX IS THIS?

The national sales tax and VAT proposals, as well as the USA, tax are referred to as consumption taxes. However, as is demonstrated in this section, the flat tax (which is often perceived as an income tax) is also a consumption tax. And, as shown in a subsequent section, the USA tax, referred to as a consumption tax, may be more like a wage tax.

A GENERAL EXPLANATION

The relationship between a wage and income tax is reasonably straightforward: since income consists of wage income and capital income, an income tax can be transferred into a wage tax merely by exempting capital income. The relationship of a consumption tax (which has to do with uses of income rather than sources of income) to these tax bases is more difficult to see. For example, a consumption tax can also be described as a tax on wages plus a tax on old capital. Even if all income were consumed, so that the aggregate tax bases were identical, there would still be a difference in tax burden between an income and a consumption tax on particular individuals. Similarly, even if total consumption equaled total wages, the tax burden

imposed through a consumption tax would be greatly different from that imposed through a wage tax.

A sales tax on consumption goods (that excludes purchases made by business) is a tax that is clearly imposed on the expenditure of income (from any source) on consumption. (Purchases of capital goods, such as machinery and buildings, are not taxed.)

A VAT performs the same function as a sales tax but collects the tax in pieces. Under a European-style VAT, the retailer pays tax on gross sales just as he would under a sales tax, but gets a credit for the tax associated with purchases from his suppliers. The supplier in turn pays a tax on his gross sales, again receiving a credit for his supplies. The supplier's suppliers, in turn, pay a tax, so that essentially the entire cost of the good is subject to tax. When all the bits of tax paid throughout the entire chain of production are added up, they are the same as a retail sales tax. (All firms get a credit for the tax on capital purchases as well.)

A subtraction-method VAT is the same as a credit-method VAT, except that rather than paying the tax and getting a credit for intermediate purchases, intermediate purchases are subtracted from the base before the tax is imposed.[2]

The USA tax includes a VAT at the firm level, and it also imposes a direct tax on consumption at the individual level by taxing all income, but deducting savings from the base. The flat tax imposes a tax on wages for individuals, and a VAT with wages deductible for firms.

The relationship between income, wage, and consumption taxes can be seen with a couple of simple equalities in the economy, which can be used to demonstrate the nature of these taxes. First, equate the income and expenditure sides of the economy as follows:

Expenditure	=	Income
↓		↓
Consumption + Investment	=	Wages + Capital Income
↓		↓
Consumption	=	Wages + Capital Income - Investment

One can now see why the flat tax is a consumption tax. In the aggregate, it taxes wages (to individuals) and it taxes capital income minus investment (or savings) through its modified VAT on firms.[3] (The modified VAT is gross receipts minus wages minus purchases, including

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[2] The principal differences between the two methods is that the credit method can be easily used to differentiate the tax rates across different types of goods and also may contribute to better compliance since firms report the purchases that generate credits. The subtraction method is easier for firms to comply with, especially if an income tax already exists.

[3] In this discussion, we use savings and investment interchangeably. In an open economy, national savings can differ from domestic investment, but this point is not important to the explanation of the consumption tax base. Note also that we consider only the major features of the flat tax; for example, fringe benefits other than pensions are taxed at the firm level, rather than the individual level, so that some portion of compensation is actually taxed to firms.

capital goods investments, which is capital income minus savings.) Also, one can see that the consumption tax base is smaller than the income base (typically about 90 percent) and that the wage tax base is smaller than both if capital income is larger than investment (typically wages are about 75 percent of income).

It should be noted that this splitting and collection of the tax in pieces causes the tax not to *look* like a consumption tax to any particular taxpayer. To the individual who has passive investments (in stocks and bonds), the flat tax looks like a tax on wages, and to firms it looks more like a tax on income than a VAT, because wages are deducted. Nevertheless, if firms act rationally in making their investment decisions, the equivalent of consumption taxation will be accomplished for each individual if there were only equity claims to capital. (As explained later, this conclusion must be modified if there is debt and individuals do not hold equal shares of equity and debt claims, since the burden on debt is shifted to equity when there is no price accommodation to the tax change.)

The USA tax is slightly more complicated, because it imposes two consumption-based taxes. The corporate tax is replaced by an 11-percent VAT; and the individual income tax is replaced by a direct consumption tax. Thus, there is actually a double-consumption-tax on corporate goods. This double-tax is partly offset at the corporate level by allowing a credit against the employers' share of payroll taxes (now set at 7.85 percent), so that the corporate VAT is really like a 3.15-percent VAT and a 7.85-percent modified VAT similar to the flat tax approach (imposed on the return to capital minus investment). Alternatively one could say that there is a 11-percent VAT for corporate production and a 7.85-percent wage tax imposed on noncorporate business, in addition to the direct consumption tax imposed at the individual level. Either way, some differential will be introduced between consumption goods produced by the corporate vs the noncorporate sector, but it will be smaller than 11 percent.

Aside from this issue, however, the USA tax actually has a smaller base than a consumption tax base because it allows the value of assets existing at the time the tax is imposed to be deducted from the tax base when converted into consumption. That makes the base fall below the consumption tax base. In particular, it moves the tax in the direction of a wage base -- a point that will be clarified in the next section when it is demonstrated that a consumption tax is equal to a tax on wages plus a tax on old capital.

Before turning to that issue, however, it may be useful to explain how the current income tax can be transformed into the various types of taxes.

LINKS BETWEEN TAX BASES

It may also be helpful to identify exactly how it is that a tax proposal becomes a consumption tax, and how that condition can be distinguished from the rate structure or the point of imposition or, even, general reforms of the income tax base. One can link the tax bases moving from an income tax base to a sales tax with the following illustration, which shows the progression from the current income tax to the flat tax, the VAT, and the retail sales tax.

(1) *From the current income tax to a more broad based tax*: If we introduced further reforms in the tax base (eliminating most itemized deductions, and so forth), we would have a broad-based income tax. The Gephardt proposal contains revisions along these lines.

(2) *From the corporate and individual income tax to a single-level income tax*: If we took the current income tax and eliminated taxation of interest, dividends and capital gains at the individual level, while at the same time disallowing the deductibility of interest, we would have a proposal for corporate tax integration similar to the comprehensive business income tax (CBIT), which was discussed in a Treasury study in 1992. Such a tax would be a single-level income tax, with capital income taxed at the firm level and wage income at the individual level. Graduated rates and exemptions would still be applied to the wage base; capital income could be taxed at the top individual rate or at some other rate.

(3) *From a single-level income tax to a flat income tax*: If we imposed flat rates, allowing only a flat exemption for individual returns, we would have a flat income tax, with an exemption.

(4) *From the flat income tax to the flat [consumption] tax*: If we now eliminated depreciation and deductions for inventories currently held when sold, but allowed the deduction of acquisitions of capital assets and purchase of inventories, we would transform the flat income tax into a flat consumption tax like the current proposed flat tax.

(5) *From the flat tax to the VAT*: If we eliminated the tax on wages at the individual level and added wages to the business tax base, we would have a subtraction method VAT. (That would, of course, require sacrificing the individual exemption.)

(6) *From the VAT to the retail sales tax*: If we eliminated the tax on all firms producing intermediate goods and simply imposed it at the final point of retail sale, without a deduction for purchases, we would have a retail sales tax on consumption.

Note that this taxonomy does not include all potential taxes. If we skipped the firm level tax altogether in the flat tax proposal, we would have a *tax on wages*. If we collected the tax on firms and taxed capital income at the individual level (which would include taxing shareholders on their share of corporate earnings), we would have one level of tax at the individual level. If we then allowed the inclusion of sales of assets and loans and the deductions of purchases of assets and repayment of loans, we would have a direct consumption tax.

The *USA tax* combines a VAT on firms with a direct consumption tax on individuals, which is substituted for the income tax and part of the payroll tax. It thus skips the corporate integration step (thereby imposing a potential double tax on consumption -- once at the individual level and once at the firm level). However, it offsets the taxes on old capital at both levels by allowing tax free recovery of capital, moving in the direction of a wage tax.

To some extent, the choice of tax base, flat or graduated rate, and point of collection are independent. There is an exception: indirect taxes like the VAT and sales taxes cannot incorporate graduated rates. Aside from that exception, however, individual taxes or firm level taxes can be imposed on any of the bases.

WHO BEARS THE TAX BURDEN?: A DIRECT CONSUMPTION TAX

Consumption taxes are usually thought of with reference to the uses of funds, rather than sources. However, they can also be linked to sources, and that will enhance our understanding of who bears the tax burden. For a consumption tax, particularly one that is imposed as a substitute for an income tax, the distribution of the burden across age groups is a crucial feature, and is the first step towards assessing the changes in tax burdens across incomes.

BURDENS OF THE YOUNG AND THE OLD

Essentially, a consumption tax is a tax on wages plus old capital (including any earnings present or future by the holder of old capital until the asset is sold). One can see this by disaggregating the consumption tax base, whose aggregate relationship obscures another activity that is going on in the economy: the sale and purchase of assets. Given a consumption tax imposed in the form of, say, a sales tax on consumer goods, we could redefine the consumption tax base as:

Consumption = Wages + Old Asset Sales - Old Asset Purchases
+ Capital Income - Investment

This relationship allows an understanding of why a consumption tax is a tax on wages plus old capital. Consider a highly simplified illustration of an economy with only two groups of people, the old and the young. In a given period, when the consumption tax is imposed, the old people own all of the capital initially, which they then use for consumption by selling the capital to the young (they also consume the capital income). Thus, their tax base is old asset sales plus capital income from capital. The young have only wages, but they save, buying the existing capital from the old, and, if the economy is growing, also spending some of their wages on newly manufactured capital goods. They pay a tax on their wages which are used for consumption, but not on their wages which are used for asset purchases. Thus, their part of the tax base is: wages minus old asset purchases minus investments in newly manufactured assets.

Hence, splitting up the above tax base into two parts:

1. Consumption of the Old = Old Asset Sales + Capital Income

2. Consumption of the Young = Wages - Old Asset Purchases - Investment

The consumption base can now be seen to include the existing capital stock. Of course, at the same time, the wage base of the young is reduced by purchases of that existing capital stock in addition to new investment. But the young essentially only pay a tax on wages. They defer the tax on the part of those wages that is not immediately consumed, until it is consumed. For example, in this simple model, when the young become old the next year, their capital assets will be sold and taxed along with any interest earned, when it is turned into consumption. The present value of this tax is the same as if the wages were taxed when earned, so that the effect is the same as wage taxation for the young, except that part of it is collected (with interest) in the following year. Another way of thinking about this is that young individuals pay a tax on their wages, but then they receive a tax benefit on their savings (just as in the case of an IRA). This tax is repaid with interest the next year. In present value terms, they are indifferent between paying the full tax on wages now and paying part of the tax now and deferring part and paying it with interest in the next period.

This example also illustrates how the tax burden in shifted in moving from an income tax to a consumption tax. Under the income tax, the tax base for the old was much smaller, because only the return to capital (interest, dividends, etc.) was taxed, and not the return of capital. Under a consumption tax both of these are taxed. Moreover, the tax rate will be slightly higher, because the overall tax base is smaller.

The young have their taxes lowered, however. They are effectively exempted from any tax on their earnings from savings, and this exemption is large enough to offset the slightly higher tax rate imposed.

A mathematical demonstration of these points is provided in Appendix A.

OTHER ISSUES

The timing of the exemption of new capital from the tax is crucial in achieving a smooth flow of tax revenue. If a tax were directly imposed on wages and old capital, the initial year's tax base would be enormous, since the capital stock is three to four times the size of the economy, and thereafter would be a much smaller. To offset this effect, the purchases of this capital by the young are deducted from wages. That is, part of the tax on wages is deferred until the capital is consumed, producing a much smaller base, leaving a base that is only slightly larger than the wage base, and maintaining a larger base in the future.

Of course, the actual economy is much more complicated, since it has many generations and only a portion of the capital stock is sold each year. Other things equal, the young tend to pay a relatively smaller tax but the burden increases with each generation, until the heaviest tax is borne by the old. The eventual effect, however, is nevertheless the same: the consumption tax base is old capital and wages and consumption taxes do not impose a tax on the rate of return to new investment.

This illustration not only simplifies the generations, but also simplifies other matters. Some individuals who might be described as "lifetime poor" do very little savings; in their case the income tax, consumption tax, and wage base are virtually identical. How the burden of the tax shifts depends on how the rates and exemption levels change, and whether transfer payments are effectively subject to tax. Some individuals who are extremely wealthy, on the other hand, may pass on wealth from one generation to another without ever consuming it. Even though the consumption tax burden would eventually apply when consumption takes place, such an event may be unlikely to occur.

These illustrations demonstrate why the consumption tax is referred to by economists as a tax on wages plus old capital. They also suggest that the concern about transition rules to provide relief to old capital are inconsistent with the fundamental nature of a consumption tax. A consumption tax with an exemption of tax on old capital moves the tax towards a wage tax, and it would be much easier to impose the tax in that way, as a wage tax. When the USA tax, for example, allows individuals to recoup basis tax free or firms to recoup depreciation on the existing capital stock, it is transforming the consumption tax base into something quite different -- a tax whose consequences vary across the generations in ways very different from income, consumption, or wage taxes.

WHO BEARS THE TAX BURDEN: INDIRECT CONSUMPTION TAX

The illustrations made thus far are for a consumption tax imposed directly on individuals. Many of the tax proposals being discussed are not of that nature. The VAT and sales tax approaches impose taxes not on the individual, but on firms. The Hall-Rabushka approach, as embodied in the Armey flat tax proposal, imposes a tax on wages at the individual level, and imposes the remainder of taxes on the firm. A portion of the USA tax is imposed on firms

via a value-added tax. These taxes only resemble the direct consumption approach if all individuals run and work in their own businesses. But most capital is held in the form of financial claims (stocks and bonds) and most individuals work for others.

VATS AND SALES TAXES: WHEN PRICES RISE

In assessing the burden of indirect consumption taxes, it is important to distinguish between those types of proposals that are likely to require a general price accommodation and those that are not. A national sales tax, or a value added tax, because it creates a wedge between the prices charged by the firms and the overall costs of production -- and in particular labor income -- would tend to produce an economic contraction if no price accommodation is made, due to sticky wages and prices (i.e., firms would find it hard to lower their wages to allow them to pay the tax and might begin reducing their work force instead).

If prices are allowed to rise to accommodate an indirect consumption tax levied in the form of a VAT, then the true burden of the tax is exactly as described in the previous section (ignoring transfer payments), but is accomplished not through direct tax payments but through reduced purchasing power. Wages and asset prices do not fall but their purchasing power with respect to consumption goods declines to produce exactly the same result (in terms of real quantities of goods consumed) as in the direct consumption tax case.[4]

If transfer payments are not indexed, they will effectively be taxed by an indirect tax that leads to price accommodation.

THE FLAT TAX: WHEN PRICES DO NOT RISE

This shifting of the tax burden via price rises can be contrasted with the Armey flat tax proposal. In general, wage income is taxed directly in the flat tax (with the exception of fringe benefits), while the remainder of the consumption base (capital income minus net investment), is taxed at the firm level. Because wages are taxed to individuals rather than to the firm, there is no reason to accommodate the tax with a rise in price.

For individuals whose capital is solely invested in their own businesses and who have no debt, the results are exactly like a direct consumption tax. A business that is making new investments has a tax base that includes gross receipts of the firms (reflecting wage income of the owner plus profits from capital plus sales of assets) minus purchases of assets, which is a consumption tax base.

For other individuals, however, the tax does not resemble a tax on consumption. Looking just at the individual tax, it appears to be a tax on wages, which means that the young in our

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[4] The indirect tax rate, if it is imposed on post-tax consumption rather than pretax resources available for consumption, as in the case of a sales tax, would be higher. (Prices of investment goods would not rise because they are exempt from the tax). For example, if a twenty percent direct consumption tax is imposed, after tax consumption will be only 80 percent of income after subtracting taxes and savings. A sales tax would have to be levied at a 25 percent rate, however, so that the consumer, when purchasing $80 dollars of goods net of tax would also have to pay a 25 percent tax ($20/$80) in order to spend $100 and maintain the ratio of 80 to 100. Technically, a tax levied on post tax consumption would be at a rate equal to v/(1-v), where v is the tax rate on resources available for consumption. If consumption on the left hand side of the equations in the consumption tax box were multiplied by (1+s), where s is the sales tax rate equal to v/(1-v), and the direct tax on the right hand side were dropped, the equations would be identical.

stylized example are actually paying as much or more than in the income tax because they have the same tax base with a slightly higher rate. The old appear to be paying no taxes at all.

Nevertheless, the tax that falls on firms must be paid by some individual -- either through capital income, wage income, or asset prices.

We consider first the effect on corporate equities when there is no debt, and secondly the overall effect on financial assets when there is debt. A mathematical proof is given in Appendix B.

The Effect on the Stock Market: No Debt in the Economy

The effect of the Armey flat (Hall-Rabushka) tax should be a pronounced fall in the stock market, according to economic theory. In the case where there is no debt, that fall should reflect the tax rate -- if the rate is 20 percent, the stock market should fall by twenty percent. In fact, such a fall would simply create the same true outcome in terms of real purchasing power as the case of a VAT or sales tax with price accommodation -- the purchasing power of assets has fallen.
With price accommodation, it occurs because the same sales price of assets in nominal terms will purchase fewer goods because the price of goods has increased. Without price accommodation, where the price of goods is fixed, the value of assets must fall.

Note that a fall in the stock market by the rate of the tax will again produce identical results to the direct consumption tax. The old individual will sell his asset for (1-v) less, while the young individual will be able to purchase his investments at a discount. As with the direct tax, this discount must be repaid with interest when he sells the asset in the next period.

What causes the stock market to fall? The basic reason is that for a newly manufactured asset (or a new firm), the rate of return on investment is going up, because the firm's deduction of asset acquisition costs (which is equivalent to imposing no tax in present value terms) renders the return higher. That means that individual rate of return, or discount rate, is higher on a new investment than an existing one. Since the return from old capital in existing corporations is still subject to the tax; the only way to make the return on the existing stocks equal to the return on the new investment (and make the individual willing to purchase it) is for the stock value to fall by the amount of the tax. For example, suppose the pretax rate of return is R; if the cash flow tax rate is v, then the flow of profits from ownership of an existing stock that originally represented a dollars worth of capital is R(1-v). But a new asset will earn a return of R because its acquisition cost can be deducted. If the value of stock falls to (1-v) it will earn the same rate of return as a new investment.

To present a simple example, suppose the pre-tax return is 10 percent and the tax rate is 20 percent. A new investment will earn a 10 percent rate of return, but an existing one (where the flow of capital is subject to the tax) will earn only 8 percent. Suppose a share of stock sells for $100. After tax, there is a annual return of $8. If the price of the stock fell to $80, it would now earn a return of 10 percent ($8/$80), making it as attractive an investment as a new $80 investment that will earn $8, for a rate of return of 10 percent.

Another way to look at this is from the maximization of profits inside the firm. If the tax rate is twenty percent, then a new asset that costs a dollar to construct can be purchased for only 80 cents, because of the immediate deduction of costs. (For both old and new investment, the flow of return will be taxed.) If stock can be sold for a dollar, then the firm can make 20

cents on the sale. Thus, at the margin, it would make sense for the firm to keep issuing stock, until the price drops to 80 cents, where a selling stock is exactly worth the value of the investment it purchases.

This analysis suggests, therefore, that the translation of an indirect consumption tax such as the Armey tax into the equivalent of a direct consumption tax would be accompanied by a dramatic fall in the value of the stock market. Theoretically, this fall should occur immediately if the tax change came as a surprise (otherwise, it should begin to occur in advance of the adoption of the tax).

Of course, there is no way to be sure that this phenomena will occur as predicted by theory; in that case, the Armey flat tax becomes a tax whose incidence, even in a fundamental way, is unknown.

The same sort of price adjustment process would occur for a VAT or a sales tax where price change was not accommodated. Because these taxes also impose an indirect tax on wages, wage rates should fall as well.

Debt and the Effect on the Stock Market

Part of the financial claims to assets are held in the form of debt, and these nominal claims cannot fall in value. In this case, the equity holders must bear the burden of the tax on old capital. In particular, for each original dollar of value, the asset value will fall by the full amount of the tax on all capital, even if equity provides only a fraction of the assets. For example, if the tax rate is 20 percent and equity constitutes two thirds of the total asset value, then the value of assets will fall not by 20 percent, but by 30 percent. If equity constituted one half of the value, the asset should fall by 40 percent. (This calculation holds if either the interest rate and return to equity is the same or if new investments are financed in the same proportion as old ones, net of the initial tax savings, and no other behavioral changes occur. It also assumes that there is no inflation. This issue is discussed further in the appendix.)

The consequence of this type of adjustment means that the type of consumption tax envisioned by the Hall-Rabushka proposal is not imposed on existing holders of debt, who pay no tax on either return of principal or interest on old capital. Their burden, however, is shifted to owners of equity. If all individuals held equal portions of debt and equity, this effect would not matter, but since there are varying portfolios, the tax would impose highly unequal tax burdens on consumption.

THE USA TAX: A MIXTURE OF EFFECTS

The USA proposal is much more complicated in many ways than the other proposals. It includes a direct consumption tax, as well as a VAT on corporations, part of which is effectively imposed on labor and part of which is like the modified tax under the Armey proposal. Were its departures from a general consumption tax contained at this point, it would exhibit some of the characteristics of all three forms of taxation discussed: a direct consumption tax that imposes a tax on asset sales and exempts purchases, a VAT that causes overall price increases that reduce purchasing power in general, and a modified VAT that causes asset prices to fall.

The USA proposal also contains a lot of other provisions that cause a departure from a consumption tax. Notably, the USA proposal allows both in the direct tax and in the corporate tax a recovery of basis of existing assets. These recoveries are adopted as transition rules.

Allowing tax-free recovery of basis in old assets is, however, inconsistent with the whole concept of a consumption tax, since a consumption tax is a tax on wages and old capital. With perfect transition rules that removed the tax on old capital and its earnings fully, there would be no tax on capital and simply a wage tax.

The recovery rules for depreciation in the USA proposal do not allow full escape from the tax because they are deducted on a schedule; this has the effect of offsetting the initial windfall loss to the firm. For example, if the present value of depreciation allowed on existing capital is equal to 50 percent of the current asset value of the firm, then fifty percent of any windfall loss will be offset. For firms that have assets with quick recoveries (such as inventories and shorter lived depreciable assets), there will be a substantial offset. This issue is discussed further in Appendix B.

Note also that for firms with ongoing investment, depreciation allowances are automatically deducted as part of replacement cost. Thus, there is no fundamental element of "unfairness" in consumption tax treatment in the loss of depreciation deductions on existing assets; indeed, allowing a recovery leads to uneven patterns of asset losses for firms depending on the nature of their assets. And, of course, allowing recovery for old depreciation when the nature of the tax causes asset prices to rise will actually lead to an increase in asset value (although nnthere will still be a loss in purchasing power).

This initial offset to the asset price fall (or the price rise) will eventually be dissipated as time goes on and the depreciation deductions are used up, with asset prices eventually stabilizing at the steady state where asset prices fall by the amount of the tax. For assets sold directly (through physical sales), these deductions are forfeited in some cases; in others, the deductions may be transferred to the purchaser.

The direct consumption tax also has a recovery of basis which acts largely to exclude the tax on old capital. It continues to effectively collect a tax on the return to old capital until that capital is sold to another individual as the older individuals begin to draw down their assets to consume. For individuals no longer working, it is the equivalent of an income tax assuming all capital is eventually consumed; for individuals still working, new capital investments are not subject to tax, while the return on old ones is. Thus, only workers receive reductions in tax with the effective reductions greatest for the younger workers.

Note that the transition paths are very different for the two recovery methods -- in the corporate tax, the effects are governed by specific recovery rules; in the direct tax, they are governed by the consumption patterns of individuals.

There are other proposals in the USA tax that also affect the tax burdens. For example, there is a fixed recovery period of individuals with a small amount of resources, which can effectively reduce the tax burden considerably. In addition, there are exclusions for a substantial amount of borrowing. And, for wealthy individuals there are a number of potential ways to avoid tax on capital income by the timing of borrowing.[5] In all, the effect of these provisions

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[5] There are a lot of other complications from this tax, including the possibility of significant tax avoidance opportunities among wealthy individuals. See Martin D. Ginsburg, Life Under a Personal Consumption Tax: Some Thoughts on Working, Saving, and Consuming in Nunn-Domenici's Tax World.

is to move the USA tax closer -- perhaps much closer -- to a wage tax rather than a consumption tax.

ECONOMIC CONSEQUENCES OF THE NATURE OF A TAX

While there are many other issues associated with these tax changes, and full exploration of these issues is beyond the scope of this paper. The following is a brief overview of some of these issues.

DISTRIBUTION ACROSS THE INCOME CLASSES

Based on annual data, a consumption tax tends to fall relatively more heavily on lower income individuals (other things equal) because these individuals consume a larger fraction of their income. Of course, the distribution across income classes is influenced not only by the nature of the tax, but by the rate structure and the tendency to induce a price increase. Also, the observed distribution across incomes in a single period reflects partly the effects of life cycle savings -- individuals in the higher earning period of their lives tend to be savers.

The consumption tax tends to shift the burden to holders of old assets, who are likely to be old. The young tend to benefit if they are likely to do a significant amount of lifetime saving, but the young who do little lifetime saving can be made worse off if tax rates are much higher. Those who do little lifetime saving are likely to be the lifetime poor. At the same time, very wealthy individuals with accumulated assets who consistently pass on wealth across the generations may also avoid the tax and may find their tax burdens lowered indefinitely compared to an income tax. Thus, these generational shifts probably contribute to a less progressive tax.

Of the types of taxes, a fully indirect tax like a VAT or sales tax is more likely to be strongly regressive. Such a tax can only be imposed at a flat rate, and its form of imposition causes the burden on old capital to fall on savings in the form of interest bearing assets (which are less likely to be held by higher income individuals) and on unindexed transfers. Direct taxes, which are partially used in the flat tax and the USA tax, can incorporate low-income exemptions and even graduated rates, although it is very difficult to compare these proposals given the extensive set of exceptions to the tax base in the USA tax and the uncertainty about revenue raising potential.

These features also affect tax burdens across income classes, depending on how the rate structure is designed and whether there are any special low income relief provisions.

SAVINGS RATES, INTEREST RATES AND OTHER ECONOMIC ASSUMPTIONS

As compared to an income tax, a consumption tax of equal yield is predicted, by life cycle models, to increase savings in the economy, while a wage tax may either increase or decrease savings. These differences are due to the windfall tax on the old that occurs in a consumption, but not an income, tax. There are two practical caveats to attach to this observation. First, there is not a great deal of evidence that there is a response of the type predicted by economic models, which could occur if individual savings decisions are heavily distorted by imperfect

information. Secondly, these life cycle models often abstract from many important characteristics of the economy which could have an effect.

If the savings rate increases and the capital stock expands, rates of return to capital will ultimately fall. The effect on the interest rate, however, is not clear because there will be some tendency to substitute equity for debt (since debt is currently less heavily taxed than equity), which could drive up the interest rate.

The effects on the housing market will vary across tax provisions. In general, housing is already exempt from the income tax because imputed rent is not taxed, and thus individuals may wish to substitute other assets for housing, especially in proposals where mortgage interest deductions are not allowed (as they should not be to formulate a true consumption tax). This effect could temporarily drive down housing prices, in theory, although previous episodes of tax changes that should have a major effect on housing prices have not shown much effect. This lack of effect could occur if the demand for housing is relatively inelastic.

ECONOMIC EFFICIENCY

Economic efficiency typically means that resources will be allocated in a manner consistent with market prices. A pure consumption or pure wage tax would allocate capital more efficiently than the current income tax (although a reformed income tax would also be more efficient). If consumption or wage tax proposals become riddled with special exceptions, they may no longer compare favorably to the income tax and could also create some distortions in the allocation of labor and consumption. With respect to overall choices of aggregate savings and work effort, a consumption tax may or may not improve these aspects of economic efficiency, depending on behavioral parameters. Although a consumption tax eliminates the distortion between present and future consumption that affects savings, its smaller base requires a higher rate that could increase the distortion between work and leisure.

A flat rate structure is likely to be more efficient than a graduated one for any type of tax; graduation is usually undertaken for reasons of equity, with some loss in efficiency part of the cost of obtaining that equity.

OTHER ISSUES

There are a number of other issues surrounding these tax proposals, including administrative simplicity and compliance, revenue adequacy, implications for international capital flows and business location decisions, winners and losers among firms in the transition, and implications for States and local tax systems. These issues will be addressed more fully, along with the issues of equity and efficiency, in a series of subsequent papers.

APPENDIX A: A MATHEMATICAL EXPOSITION OF THE CONSUMPTION TAX BURDEN

This section demonstrates how the tax burdens fall differently on the older and younger generations using some simple mathematical expressions. This section can be skipped by the reader who is not concerned with mathematical demonstrations, as it simply formalizes the verbal discussion in the paper.

The box below demonstrates how an income tax falls on both the old and young generations in a highly stylized model, with two generations. For simplicity, a single level flat rate tax is shown.

Illustration: How An Income Tax Falls on the Old and Young

Under a simple income tax, we can describe the consumption of the old and young as:

(1) $C_o = (1+R(1-t))K$

(2) $C_y = WL(1-t) - (1+g)K$

K is the capital stock, R is the rate of return, W is the wage rate, C is consumption, L is the labor supply, t is the tax rate, and g is the growth rate (so that the young generation is (1+g) times the old). Consumption of the old in (1) is the value of assets plus earnings on assets less a tax on those earnings. (1) and (2) together result in total consumption as the sum of wages plus capital income minus savings minus taxes on income:

(3) $C = WL + (R-g)K - t(WL + RK)$

From the point of view of the young individual, this tax falls on both labor and capital income. The young are (1+g) times the previous generation but their future consumption is also discounted; i.e., multiply equation (1) by (1+g) and divide by (1+R(-t)) then add the new to the young's consumption to obtain:

(4) $C_y + C_o*/(1+R(1-t)) = WL(1-t)$

The capital tax shows up in the discount rate, and the labor tax on the right hand side.

In this simple model, the tax on capital income is paid by the old who own all of the capital and the tax on wages is paid by the young who supply all of the labor. (In a more realistic model with many generations, each generation pays tax on both labor and capital income, but the tax on wages is collected from workers who are younger overall and the capital income tax largely from generations old enough to have accumulated assets).

The first two equations simply restate the consumption of the old and young as discussed above: the old consume the sale proceeds from the capital stock plus earnings on capital (after paying income taxes), and the young consume wages (after paying incomes taxes) minus purchases of capital minus new investment.

These two simple equations are combined in two ways -- to show current aggregates in the economy and to show the burden on the young. The first (equation 3) shows the total economy-wide consumption equals income minus income taxes and net investment. Equation (4) shows the consumption, present and future, of the young through a budget constraint. Future consumption is discounted (to recognize that a smaller amount of money is required today to consume a larger amount in the future because of the interest that can be earned). As this equation shows, both capital and labor income taxes show up in the young individual's budget constraint.

Now consider the consequences of shifting from an income tax to a consumption tax, as also illustrated mathematically in the box below. Again, the tax is a flat rate one. Now the old consume after paying taxes on both their sales of assets and their capital earnings. The young are able to deduct their purchases of old capital and their new investments from their wages before paying tax. One can readily see how the tax burden on the old rises -- the tax rate is slightly higher because the economy-wide tax base is smaller and the tax base for these individuals is larger. The young, by contrast, pay smaller taxes.

Illustration: How a Consumption Tax Falls on the Old and Young

Now substitute a direct consumption tax, v, for the income tax; v is larger than t because the consumption tax base is below the income tax base.

(5) $C_o = (1+R)K(1-v)$

(6) $C_y = [WL - (1+g)K](1-v)$

Compared to an income tax, the tax burden of the old has gone up: the slightly higher tax rate is imposed on the sale of old capital as well as the return. The young pay less tax because purchases of assets and new investments are exempt from tax. These amounts sum together to:

(7) $C = WL + RK - gK - v(WL + RK - gK)$

or consumption equals income minus savings less taxes on consumption.

When the young convert their savings to consumption in the next period when they are old, they will have to pay a tax, but they benefitted by the initial deduction (much like an IRA) -- they deferred the tax on part of their wages until the second period, but then paid it with interest, which is the equivalent to a simple tax on wages. Again, the young are (1+g) times the previous generation but also discount their future consumption; i.e., multiply equation (1) and (4) by (1+g) and divide by (1+R(-t)) or (1+R), and then add the new to the young's consumption to obtain:

(8) $C_y + C_o^*/(1+R) = WL(1-v)$

In this case, the left side of the equation is discounted expenditure, and the right side income; for the young, there is only a tax on wages under the consumption tax.

As with the income tax illustration, the equations are combined in two ways. Equation (7) shows the aggregation of income and tax base in the economy. The young individual's budget constraint in equation (8) now contains only a tax on wages -- there is no tax on investment in new capital.

APPENDIX B: ASSET PRICES UNDER THE FLAT AND USA TAXES

EQUITIES ONLY

To understand the basics of asset price effects, first consider the simplest case of a new investment being made (that investment is in a perpetual non-depreciating asset for simplicity), equal to one dollar. The firms invests until the present discounted value of the marginal product of capital, c, is equal to the cost of the investment.

$$(9) \quad 1 = \int_0^{\infty} c(1-u)e^{-Rt}\,dt$$

In (1), c is the marginal product of capital, u is the tax rate, and R is the after tax discount rate. When this equation is solved:

$$(10) \quad c = R/(1-u)$$

We can also see that, presuming we have a production function where the average and marginal product of capital are equated, the present value of a share of stock that earns the firm's profit is also equal to one, that is, a firm that perpetually earns pretax profits of c will be valued at one dollar, because (10) represents both the marginal and average profit of the firm.

Suppose now that we eliminate the income tax and impose a consumption tax, as in the Armey flat tax, of rate v. Let us hold the marginal product of capital constant (as it cannot change immediately), and solve for a new discount rate, R*. Consider first what will be earned on a new investment. The flow of profit will be taxed, but the initial acquisition will be deductible (hence an immediate cash flow of v), so that the investment relationship will be:

$$(11) \quad 1 = \int_0^{\infty} c(1-v)e^{-R^*t}dt \; + \; v$$

when this equation is solved, the new discount rate, R* will be:

$$(12) \quad R^* = R/(1-u)$$

The discount rate -- the opportunity cost of funds in a new investment -- has fallen. For the flow of existing investments that determines stock market prices, the rate of return is still subject to tax. Thus the value in the stock market of a unit of capital that formerly was worth a dollar is:

$$(13) \quad V = \int_0^{\infty} c(1-v)e^{-(R/(1-u)t}dt$$

which, when solved is:

$$(14) \quad V = \frac{c(1-v)(1-u)}{R}$$

or, substituting from (12):

(15) $V = (1-v)$

That is, the asset value falls by a fraction determined by the consumption tax rate.

DEBT AND EQUITY

Now consider the case where there is a fraction of the cost, f, that is borrowed. From the point of view of the equity holder, under the pre-existing income tax:

(16) $1 = \int_0^\infty [c(1-u)-fi(1-u)e^{-Et}dt + f$

In this new investment analysis, the cash flow is increased by the proceeds of borrowing (the last term, f), but is reduced by the flow of interest payments, i times f, which are multiplied by (1-u) because they are deductible.

When this investment is solved for c, the result is:

(17) $c = \frac{E(1-f)}{(1-u)} + if$

The value of the share of stock representing the flow of equity earnings from this investment is:

(18) $V = \int_0^\infty [c(1-u)-fi(1-u)e^{-Et}dt$

or

(19) $V = (1-f)$

The total claims to this investment add up: the equity share of (1-f) plus the bond worth f total to 1.

Now suppose we keep the same amount of debt issue for new investment.

(20) $1 = \int_0^\infty [c(1-v)-fi]e^{-E^*t}dt + f + v$

Solving for E*:

(21) $E^* = \frac{E(1-f)(1-v)/(1-u)-ifv}{(1-v-f)}$

Now consider the value of corporate stock, V, given the new discount rate and tax rates:

$$(22)\quad V = \int_0^{\infty} [c(1-v)-fi]e^{-E^*}dt$$

by substitution, the value of the stock is equal to:

$$(23)\quad V = (1-f-v)$$

Note that the stock market will fall by more than the tax rate as applied to all investment, not just the equity share. If the tax rate were 20 percent, and the debt share 1/3, the percentage fall in the stock market would be 30 percent, not 20 percent.

This example does not take into account changes in the amount of debt issued to finance a dollar of investment or, of course, any behavioral responses.

RECOVERY OF DEPRECIATION UNDER THE USA TAX

To simplify this illustration, return to the case of no debt. Assume now that the new investment depreciates at rate d and that tax depreciation deductions are also allowed at the same rate. The marginal investment under an income tax is:

$$(24)\quad 1 = \int_0^{\infty} [c(1-u)+ud]e^{-(R+d)t}\,dt$$

Note that a tax deduction is allowed for d, and that the product also declines at rate d. When this equation is solved:

$$(25)\quad c = R/(1-u) +d$$

Now consider a firm that is maintaining a fixed capital stock of $1 by reinvested to replace depreciating capital:

$$(26)\quad V = \int_0^{\infty} [c(1-u)-d+ud]e^{-Rt}\,dt$$

The value of this firm equals a dollar (note that because of replacement, the asset does not decline).

Now consider a marginal investment with a replacement by a consumption tax and solve for the new discount rate:

$$(27)\quad 1 = \int_0^{\infty} [c(1-v)]e^{-(R^*+d)t}\,dt + v$$

Note that depreciation deductions are eliminated but expensing is added. The value of R* is:

$$(28)\quad R^* = R/(1-u)$$

Now determine the value of the firm with the new discount rate and the allowance of an arbitrary recovery of existing basis, denoted as z per dollar of existing capital:

$$(29)\quad V = \int_0^{\infty} [c(1-v)-d+vd]e^{-R^*t}\,dt + zv$$

Note that except for the replacement of u by v, the measurement of annual flow in the integral term is unchanged, because the expending of replacement investment is the same as the depreciation deduction. But there is an additional term which represents the recovery of old basis.

When this integral is solved, the value of the firm is:

$$(30)\quad V = (1-v+zv)$$

If recovery is very quick, z is close to one, and most of the asset price decline is diverted. This recovery of depreciation, which appears to be in the interest of fairness, actually creates inequities across firms, depending on the nature of the assets to be recovered.