Will a Consumption Tax Kill the Housing Market?

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Widespread negative perceptions about the federal income tax system—that it has become a burdensome source of economic inefficiency, is unfair, and is administratively unworkable—have spawned numerous calls to replace the income tax with a comprehensive consumption-based tax. Taxation on the basis of consumption would shift the locus of the tax system from the generation of economic resources to the consumption of economic benefits, would level the playing field between consumption at different stages of the life cycle, and would equalize the tax treatment of alternative assets (see, for example, Hall and Rabushka 1995). As a matter of course, however, equalizing the tax treatment of all investment

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vehicles would eliminate the tax-favored status of owner-occupied housing—
a reform at odds with both the history of taxation in the United States and
conventional political wisdom. The deductibility of mortgage interest and
state and local property taxes can be traced to the inaugural federal income
tax in 1913.

The durability of the preferential tax treatment of owner-occupied housing
reflects the widespread fear that reform (seemingly any reform) would harm
the property values of homeowners. Consumption-based reforms are por-
trayed as especially threatening and raise the specter of a massive decline in
housing values, substantial windfall losses in the housing wealth of U.S.
households, and large-scale defaults on mortgage obligations. In an early and
widely publicized study, Data Resources Incorporated (DRI) predicted an
apocalyptic fall in housing values; it estimated that a flat tax would result in
an aggregate decline of 15 percent, equivalent to a loss of $1.7 trillion in hous-
ing equity (see Brinner, Lansky, and Wyss 1995).

Should the public believe this? Such a forecast would be convincing if it
stemmed from a careful analysis of the behavior of the housing market. But
the DRI analysis does not reflect any, much less sophisticated, economic
behavior. Instead, the forecast $1.7 trillion decline in housing values is sim-
ply the present value of the benefits lost by the elimination of the deductions
for mortgage interest and property taxes.¹

A step in the right direction is the conventional, static analysis of Capozza,
Green, and Hendershott (1996), which reaches conclusions similar to those
of DRI. The authors assume that tax reform would not change the user cost—
the conceptually correct rental-equivalent price—of owner-occupied housing;
they calculate the change in housing values on this basis. However, if the
prices were unchanged, then the quantity of housing purchased would also
remain fixed. Thus, the assumptions in a conventional user-cost analysis
imply that fundamental tax reform would have absolutely no impact on the
size of the housing sector. Put differently: the tax-favored treatment of resi-
dential housing has not induced any economic distortion; this conclusion is
at odds with both casual introspection and a large body of research.

We revisit the impact on housing values by a reform through a consump-
tion tax: we use a framework that reflects economic decisionmaking by house-
holds (buying more when prices decline; buying less when they rise) and
rational valuation of houses as assets. Moreover, because the key aspect of
reforms is a mandatory transition from one tax regime to another, we focus on
the dynamics of the transition in the housing market, in addition to the
longer-term repercussions of tax reform.

A reform through a consumption tax could raise the market value of exist-
ing homes, even though the reform eliminated tax-based subsidies. Consider
a simple example in which individuals do not itemize deductions of mortgage
interest or property taxes (40 percent of homeowners do not) and in which
the consumption tax takes the form of a 20 percent value-added tax (VAT). Eliminating deductions would obviously have no direct impact on existing homeowners in these circumstances, while the VAT would raise the cost of new homes by 20 percent. Older, existing homes would enjoy a tax-based advantage of 20 percent, leading to a rise in their value, ceteris paribus.\(^2\)

Over the longer term, the natural process of new construction, rental conversions, the razing of existing dwellings, and other market adjustments would eliminate the distinction between existing and new homes, and the price differential along with it. But during transition, the tax reform would have the perhaps surprising effect of enhancing the value of older homes. To the extent that households itemized, the loss of deductibility would mitigate that effect, but the underlying tendency would remain.

Our goal is to put some meat on this skeletal insight with a formal, numerical simulation model emphasizing the economic fundamentals of the aggregate housing market. Before doing so, we revisit the facts of size and composition of the U.S. housing market. Next we summarize the key features of some of the leading proposals for tax reform, with an emphasis on their common features. Then we sketch the economic framework for our tax analysis, the key results detailed next. After revisiting our analysis with an eye toward distributional issues and the realities of implementing tax reform, we summarize the analysis.

The U.S. Residential Housing Sector

Residential housing is an important element of the U.S. economy. First, there is a lot of it. The *Statistical Abstract of the United States* reports that in 1995 the value of fixed reproducible wealth in residential housing was $7.7 trillion, constituting nearly 50 percent of private capital ($15.7 trillion) and 34 percent of total fixed wealth ($22.6 trillion). And much of this wealth lies in the hands of homeowners. Again, with 1995 to give a sense of comparable magnitudes, the owner-occupancy rate (as a fraction of all occupied households) was 64.7 percent, a figure that has been stable over the 1990s.

However, the new activity in the housing market—despite its absolute size—is a less important part of the annual economy. Between 1995 and 1997, residential investment constituted only a bit more than one-quarter (28 percent) of annual private gross fixed investment. Accordingly, the housing sector draws only a minor part of the economic resources available for investment, and increases or decreases in this demand would likely be accommodated without great pressure on the costs of capital. As another reflection of this fact, 667,000 new privately owned one-family housing units were sold in 1995, compared with sales of 3,812,000 existing one-family housing units. In other words, sales of new homes accounted for slightly less than 15 percent of all sales in 1995.
The moral for housing market analysis is twofold. First, sales of both new homes—one-quarter of fixed investment, or 15 percent of home sales, is nothing to sneeze at—and of existing homes must be analyzed simultaneously. Second, analyzing the housing market can be done without the complication of tracing the performance of the economy as a whole.

**Tax Treatment of Housing and Consumption-Based Reform**

The current system gives owner-occupied housing a tax preference. The fundamental source of this tax preference is the exclusion of imputed rent (or the service value of the home) from the income tax base. If one owns a home and rents it to others, the rent is included in the income tax base. However, if that homeowner in effect rents the property to himself by occupying it, the implicit, or imputed, rent payments are not counted toward taxable income. In the language of consumption-based reform, the consumption of housing services (for which one would pay imputed rent to oneself) would not be taxed. Clearly, the objective of consumption-based tax reform is to include housing (and all other) consumption in the tax base. In that way, consumption-based reform would eliminate the tax preference toward owner-occupied housing.

The income tax system has three other effects on housing decisions. First, property tax payments are deductible. To the extent that those taxes are properly viewed as payments for consumption benefits provided by local governments, deductibility lowers the price of the consumption relative to direct payments or nontax payment for these services. Reform through a consumption tax would eliminate deductibility and would level the playing field with respect to government-provided consumption.

Second, mortgage interest payments are deductible and lead to a subsidy to debt-financing, *ceteris paribus*. Of course, to take advantage of the subsidy, homeowners must itemize deductions on their income tax returns. As a result, the effective size of the subsidy is the amount by which mortgage interest exceeds the standard deduction (in contrast to total mortgage interest deductions). Similarly, if individuals itemize their deductions, the provision lowers the cost of additional debt-financed housing and distorts marginal incentives. The same is not true, however, if homeowners employ the standard deduction. We return to this issue below.

Third, capital gains on housing are essentially untaxed and constitute a reduced tax on housing equity returns, *ceteris paribus*. Because consumption-based systems would not tax the return to saving and investment, such reforms would equalize the treatments of all assets. With respect to housing in particular, mortgage interest deductibility would be eliminated while the nontaxation of capital gains would be retained.

In sum, the transition to a consumption-based system may be disentangled into two separate steps. First, the elimination of deductibility would level the
playing field with respect to asset returns and government-provided consumption. Second, the taxation of imputed rent, or housing consumption services, would bring housing into the consumption tax base.

In practice, reforms would implement those steps in a variety of ways. The most direct would be a national retail sales tax, which would entail a tax on the purchase of a new home—and would thereby raise its price. Similarly, the consumption tax could be implemented as a value-added tax (VAT); again, the reform would appear in the housing market as a tax on transactions in the construction and sale of new homes. Finally, proposals for a flat tax, derived from the work of Robert Hall and Alvin Rabushka, may best be viewed as a VAT in which taxes on the wage base would be collected at the household level, while taxes on the remainder of value added would continue to be collected at the firm level. The latter component would effectively raise the price of new housing; the increase would be the equivalent of paying in advance a stream of future taxes on the annual consumption value of the shelter services provided by the house. Because of the popularity of the flat tax and its variants, we focus on this as our model consumption tax reform. At the same time, our results are more general than such a focus might seem to imply: the purest form of the flat tax would have the same economic effects as either a VAT or a national retail sales tax at the same rate.

A Framework for Tax Analysis

At the heart of tax reform proposals is the notion that the fully phased-in reformed tax system would be economically superior to the existing income tax. Accordingly, any framework for tax analysis should be capable of capturing the long-run effects of fundamental tax reform. But at the same time, the political economy of reform demands an assessment of the transitional and phase-in effects of the reform. With respect to housing, the conventional analysis is an odd and inappropriate mix of these two approaches. First, the total amount of housing is typically viewed as fixed; this condition suggests that the analysis is suitable only for a very short period (or is based on the transparently counterfactual notion that the U.S. housing market is not subject to swings in building activity). At the same time, the effects on prices are portrayed as permanent ones, with the implication that these price swings are consistent with the long-term outlook. In fact, neither is likely to prevail during a reform.

Instead, we employ an approach that yields not only the permanent, long-term impacts on the residential housing market but also the dynamic adjustment path for the value of housing during the postreform transition. We begin with the observation that housing has a dual role: (1) it is a consumption good in the same way as food, clothing, and other necessities and (2) it is an investment vehicle. Because of the second role, competition in the asset
market demands that homeowners be compensated for holding their house in a way comparable to the after-tax return on alternative investments. However, because of the first role, part of the return takes the form of consumption benefits—the valuation of the services the house provides as a shelter. In short, if \( i(1 - \tau) \) is the after-tax return on an alternative investment (for example, a taxable, interest-bearing bond), then the return offered by housing must meet the hurdle

\[
i(1 - \tau) = \frac{S}{H} - \frac{[t_p (1 - \tau) + \delta + m] P_H}{P_H} + \frac{\Delta P_H}{P_H}
\]

(4-1)

where \( i \) is the nominal rate of return, \( \tau \) is the individual's marginal income tax rate, \( S \) is the implicit service flow (also known as the imputed rent) from ownership, \( H \) is the amount of housing, \( t_p \) is the property tax rate, \( \delta \) is the percentage rate of depreciation, \( m \) is the percentage rate of maintenance costs, \( \Delta P_H \) is the price of a house, and \( \Delta P_H \) is the change in the value of the house, that is, the capital gain on housing. Thus, the return to housing comes in two forms. The first is nonfinancial and is measured by the consumption benefits net of property tax, depreciation, and maintenance costs. The second, financial, return is the (untaxed) capital gain on housing. Because that return reflects both investors' preferences for assets and homeowners' demands for shelter, equation 4-1 effectively captures the demand for owner-occupied housing. Because houses might be subject to capital gains or losses during market transitions, the equation captures equally well the long-term demand (when prices stabilize and capital gains are eliminated) and the short-term demand (in the face of fluctuations in house prices).

Of course, we require a supply curve as well to track the evolution of the market. We capture the incentives to builders by noting that new construction \( (C) \) (or increases in the housing stock) becomes greater when building houses is more profitable; that is, when house prices (or values) rise compared with the construction or replacement cost:

\[
C \equiv \Delta H = \Phi(P_H) H.
\]

(4-2)

Taken together, equations 4-1 and 4-2 comprise a standard, dynamic, asset-market-oriented model of tax analysis.

**Aggregate Impacts of Tax Reform**

As noted, consumption-based tax reforms could be enacted in a variety of
equivalent forms: as a national retail sales tax, as a VAT, or as one of several
descendants of the flat tax. Because of the convenience of the equivalence, we
focus on the flat tax here. The discussion above also indicated the usefulness
of thinking of two steps in a consumption-based reform: (1) the elimination
of deductibility, followed by (2) the taxation of housing consumption benefits.
We also discuss the effects of a partial reform that stops at the first step: the
elimination of deductions for mortgage interest and property taxes.

To implement our approach (details are in the appendix), we must adopt a
solution technique, particular functional forms for housing demand and sup-
ply, and numerical values for key parameters. For the present purposes, the
key feature of our approach is the focus on a representative homeowner. That
is, our model is well suited for describing the typical effects in the overall mar-
ket. It is not explicitly designed to analyze particular submarkets (for exam-
ple, vacation homes), although we touch briefly on issues of distribution
below.

Our representative homeowner faces a property tax at a rate of 1.4 percent
and is presented with maintenance and depreciation that average 3.0 percent
of the value of the house. He has a marginal tax rate of 0.22, which would fall
to 0.194 when deductibility is removed and to 0.17 under the flat tax. We
set the loan-to-value ratio at 0.4 and assume that 60 percent of mortgage
interest and property taxes are deducted. Those assumptions accurately cap-
ture the marginal incentives when 40 percent of homeowners do not itemize.
However, the assumptions do not recognize the impact of the availability of
the standard deduction in reducing the total subsidy provided by the
deductibility of mortgage interest.

Our nominal interest rate is 7.5 percent, roughly in line with current con-
ditions. For the week ending October 2, 1998, the primary mortgage survey
of the Federal Home Loan Mortgage Corporation (Freddie Mac) indicated that
the thirty-year fixed-rate mortgage (FRM) averaged 6.60 percent, with fees
and points averaging 1.0. One year earlier, the thirty-year FRM average was
7.31 percent.

Turning to the key behavioral parameters, we choose the (inverse price)
elasticity of demand for housing services to be $\eta=-2.0$, but we vary this value
between -0.5 and -3.0 to gauge the impact of this parameter on the results.
On the supply side, we use a baseline elasticity of construction with respect
to $P_H$ of 0.8. Again, however, because the responsiveness of new construction
to the alterations in the tax regime is central to the dynamics of the housing
market, we vary this elasticity between 0.1 and 0.9.

We present the results of simulating the reforms in a series of figures. The
simulations provide two types of responses: long-run changes in the housing
market and the transitional dynamics of adjusting from the existing tax system
to the reform setting. Although it is not the primary focus of this study, we
begin with the former before turning to an analysis of the adjustment paths.
TABLE 4–1
Changes from Initial to New Steady States

<table>
<thead>
<tr>
<th>Remove Deductibility</th>
<th>Flat Tax</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent change</td>
<td>Percent change</td>
</tr>
<tr>
<td>in $P_H$</td>
<td>in $H$</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Baseline</td>
<td>0</td>
</tr>
<tr>
<td>($\varepsilon=0.8, \eta=-2; \beta=0.4$)</td>
<td></td>
</tr>
<tr>
<td>$\eta=-0.5$</td>
<td>0</td>
</tr>
<tr>
<td>$\eta=1.0$</td>
<td>0</td>
</tr>
<tr>
<td>$\eta=2.5$</td>
<td>0</td>
</tr>
<tr>
<td>$\eta=-3.0$</td>
<td>0</td>
</tr>
</tbody>
</table>

NOTE: $\varepsilon =$ structure supply elasticity; $\eta =$ inverse elasticity of housing demand; $\beta =$ loan-to-value ratio. Percentage changes for various values of $\varepsilon$ are identical to those in the baseline case.

Our examination of long-run responses begins in table 4–1. As shown, the tax regime directly dictates the steady-state changes in the value of $P_H$. Under the flat tax, the steady-state value of $P_H$ would rise by a percentage equal to the business-level tax on new construction. Simply removing deductibility would have no effect on $P_H$.

In contrast, the contraction in the quantity of housing differs markedly across the two reforms. Consider the first row of the table, which shows the results of removing the deductions for mortgage interest and property taxes. The reform would induce an eventual decline of 1.9 percent in the housing stock. In contrast, the flat tax results in a greater long-term decline of 8 percent. In short, removing the tax subsidy for owner-occupied housing and taxing it directly would lead to a smaller housing stock. Although that qualitative result is not unsurprising, it is at odds with previous analyses of reforms. Also, because the flat tax would raise the effective price of housing consumption more dramatically, it would have a greater effect on the quantity demanded.

As noted, despite the magnitude of the housing market in absolute terms, it constitutes a relatively small fraction of the new flow of capital investment. Thus, the long-run supply of housing could, one assumes, be expanded without price increases. For that reason, the replacement cost would be constant, and changes in the parameters of the construction function would not affect the simulations. Alternative assumptions regarding the behavior of housing demand, however, would influence the nature of the steady state. To give the reader a feel for the issue, the rows of the table show the effect of varying the price sensitivity of demand embodied in the value of $\eta$. A look across the columns indicates that varying the behavior does not alter the
WILL A CONSUMPTION TAX KILL THE HOUSING MARKET?

**Figure 4–1**
Impact of Removing Deductions for Mortgage Interest and Property Taxes

**Figure 4–2**
Impact of Flat Tax

ordering of the effects of the reforms on the housing stock. Glancing down rows, however, points to the effect on the magnitude of the impact of tax reform. As the demand for housing becomes more price sensitive with respect to the user cost (that is, as $\eta$ grows in absolute value), the decline in the stock of housing lessens. Not surprisingly, the more elastic the demand, the greater the impact of introducing a tax is.

These results are useful for gauging the long-term pressures introduced by
tax reform. At the heart of the issue, however, are the short-run dynamics of the housing market as engendered by a reform. Figure 4–1 shows the simulated impact of removing deductions for mortgage interest and property taxes. The immediate effect would be a reduction in housing values, a result consistent with both conventional wisdom and our economic framework. However, the magnitude of the decline would be only a bit more than one percentage point and would be reversed relatively quickly. In contrast, the figure indicates that the size of the residential housing sector would fall steadily and reach a long-term reduction of about 2 percent. Of course, that is precisely the idea behind the efficiency gains from tax reform: existing subsidies have produced a housing sector that is “too large.” Efficiency-enhancing reforms would channel economic resources elsewhere in the economy.

As noted, removing deductions would be only one part of a fundamental reform such as a flat tax. As shown in figure 4–2, however, our simulation of the effects does not suggest a dramatic decline in housing values. Instead, the short-run impact would be for prices to rise by roughly 10 percent and ultimately by 17 percent. Our earlier discussion suggests precisely that response. The decline because of the loss of deductions would be more than offset by the positive impact on prices of the business-level tax.

Figures 4–1 and 4–2 focus on the level of housing prices and on comparisons between old and new housing. Because fundamental tax reform, however, might affect the prices of other goods as well—and thus the overall price level—ascertaining the real value of housing wealth might become more difficult. For example, Besley and Rosen (1998) find that sales taxes are often incorporated into sales prices at a rate exceeding 100 percent. In this context, new housing prices might rise by far more than 17 percent and thereby draw up the prices of existing homes by a greater amount than shown in figure 4–2. At the same time, the impact on the consumer price of other goods might be less than 100 percent. (One could imagine as well reverse scenarios in which the price of a nonhousing good would rise by more than 17 percent, but the price of housing by less.) In short, while that issue is important, its net effect on the analysis is far from obvious and is not resolved here.

Figures 4–1 and 4–2 embody the bad news—goods news of fundamental reform. The bad news is that the elimination of the tax subsidies for housing would place downward pressure on house prices. The good news is that the introduction of a consumption tax on new housing would enhance the value of existing homes. That result might make the distributional effects of tax reform more palatable, while the increased cost of new homes would channel scarce capital to other, more valuable uses in the economy.

Robustness of Results. Our numerical simulations reinforce the qualitative story in the introduction. The numbers themselves, however, are the outcome of our particular decisions regarding parameter values and the economic environment. An exhaustive summary of the numerical implications of changing
each parameter is beyond the scope of (our patience and) this chapter. However, in figures 4–3 and 4–4 we focus on the implications of assuming a highly unresponsive housing supply.

We do so for two reasons. First, the conventional analysis assumes a completely unresponsive supply. That situation strikes us as unrealistic, but gauging the effects of a fairly unresponsive supply might be useful. Second, the supply response to the nature of fundamental reform would be a contraction in the housing sector. Because scant empirical experience with that phenomenon exists, our understanding of its magnitude is accordingly thin. Introspection suggests to some that the response would be quite slow and difficult—we must wait for houses to fall down. However, to others the adjustment would be relatively painless and quick—houses could leave the homeowner sector through the stroke of a lawyer's pen and could become commercial buildings or rental units.

In any event, to gain a feel for the impact, we used a much lower value of the supply elasticity, \( \varepsilon \) — 0.3 instead of 0.8—to recompute our simulated
reforms. Comparing figure 4–3 with figure 4–1 indicates that the lowered responsiveness would generate a greater initial decline and a slower convergence with the new long-run equilibrium. However, the main message appears to be that, with plausible parameter values, implications of removing deductions are quite modest for the housing market. A similar lesson emerges from comparing figures 4–2 and 4–4. Again, a less responsive construction industry would lead to stronger downward pressure on prices—in this case a smaller rise—and slower adjustment to the ultimate size of the housing sector.

As another possibility, we may have simply stacked the deck on the demand side by giving our representative homeowners too low a tax rate (and thus low valuation of deductions) or too few deductions (and thus indifference to deductions at all). To guard against that possibility, we show, in figures 4–5 and 4–6, the dynamic adjustments to tax reform under worst-case conditions. To maximize the impact of the loss of deductible mortgage interest, we assume that all homeowners itemize their deductions and that each home is fully mortgaged (the loan-to-value ratio, $\beta$, is 1.0). Both assumptions are clearly unrealistic but identify the upper bound of the size of deductions. Moreover, we make the deductions as valuable as possible by focusing on the homes of the well-to-do: we assume that all households have a marginal tax rate of 39.6 percent. For the coup de grâce, we assume that the supply response is unrealistically minimal ($\epsilon$ is set equal to 0.1) and that the household demand is extremely price sensitive ($\eta$ is equal to -0.5).

The numerical implications of our choices are that housing prices are forecast to fall by roughly 18 percent in response to the loss of deductions (see figure 4–5) and to recover much more slowly. Similarly (see figure 4–6), in such circumstances the move to a consumption tax would result in a decline of 12 percent in housing prices, in contrast to the earlier upward pressures. In one interpretation of these results, the disaster in the housing market indicated by the conventional analysis could prevail only under the most unlikely combination of circumstances. More charitably, while the aggregate housing market would be relatively unaffected, one might expect particular market segments to respond more to tax reform.

**Important Secondary Effects.** Consistent with our focus on the housing market in isolation from the larger economy, the discussion thus far has assumed that reform through a consumption tax would not change either economywide conditions (we use a constant interest rate) or financial practices (we keep the loan-to-value ratio constant). Those suppositions are valuable in isolating the impacts of reform in our partial equilibrium model. But they are at odds with the larger setting of a fundamental tax reform. Specifically, it has been argued that interest rates would fall in the presence of a flat tax and that homeowners would reduce their mortgage debt in the absence of deductions. Consequently, examining the extent to which those economywide repercussions of tax reform would affect our
WILL A CONSUMPTION TAX KILL THE HOUSING MARKET?

FIGURE 4-5
Worst-Case Scenario after Removal of Deduction

FIGURE 4-6
Worst-Case Scenario under Flat Tax

simulations of the transition would be interesting.

To this end, in figure 4–7 we present a variant of our baseline simulation of the flat tax in which the interest rate falls (as suggested by Hall and Rabushka 1995) and the loan-to-value ratio is reduced (see Follain and Melamed 1998). We allow the interest rate to fall by one percentage point (to 6.5 percent) and the loan-to-value ratio to fall by ten percentage points (to 30 percent). As anticipated, those secondary changes in the economy would mitigate the narrow repercussions in the housing market diagramed in figure 4–2. House prices would adjust more quickly to the long-term levels, and the long-term decline in the size of the housing stock—previously 8 percent—would be only about 5 percent. In summary, to the extent that interest rates fell and homeowners reduced their mortgage debt in response to tax reform, the effects on the housing market would be reduced.
Our analysis has focused on the aggregate effects of tax reform on the housing market and suggests that the detrimental overall impact of consumption-based reform might be less frightening than previously advertised. However, introspection suggests that actual experiences would lie in a range that would be either more beneficial or somewhat more extreme than the overall average. And as the discussion of the worst-case scenario highlighted, the latter possibility could be a sobering reality to those households that had high income and property tax rates, itemized their deductions, and were highly leveraged. In short, the impact on affluent households would likely be greater (in percentage terms) than that on lower-income households.

As an impediment to tax reform, however, that insight stands conventional distributional politics on its head. Strangely, proponents of retaining the income tax—typically on the ground that a consumption tax would be regressive—base their support (at least in part) on the effects of reform on the housing market, when in fact those effects would increase the progressivity of a consumption tax. Moreover, the effects on the affluent would be the greatest precisely because existing tax subsidies most distort the housing decisions of the affluent. In sum, reform would enhance both efficiency and progressivity precisely because of the relatively major impacts on the affluent.

**Tax Reform: Now and Forever?**

To this point, a tax reform that happens now and lasts forever has framed our analysis. In technical terms, the tax reform is considered as unanticipated and permanent. In reality, tax reforms are widely debated and anticipated, and none has lasted forever. How do these features affect our conclusions?
Consider first the ability to anticipate the enactment of a major reform. During the period of debate and drafting, participants in the housing market would begin to revalue existing houses in light of the potential tax code. Thus, to the extent that their values would rise, the increases in the market prices would predate the actual enactment of the tax reform. Similarly, to the extent that the reform slowed new construction, builders would cut back in anticipation of a building slowdown. In short, the ability to foresee a reform would permit the market to adjust in advance of the reform, with the likely outcome that any price changes would be spread over a longer period. That reaction would lessen the likelihood of any scenario characterized by sharp, cataclysmic price changes.

Similarly, to the extent that the tax reform was viewed as less than permanent, a mixture of two views would drive actual prices: the “correct” prices under the current system and the “correct” prices under the tax reform. Accordingly, any suspicion that the pendulum might swing back toward the income tax would reduce the extent of the changes in prices and the supply of building.

Summary

Our goal has been to combine a rigorous economic model of the aggregate owner-occupied housing market with a numerical simulation model crafted to elucidate the likely transitional and long-term impacts of fundamental tax reform. Although the extent ultimately lies in the eye of the beholder, we conclude that the price impacts of even a fundamental reform of the federal income tax would likely be relatively modest. For that reason, concerns over the impact of tax reform on housing values and household net worth are almost certainly overstated and, to the extent that reform is otherwise desirable, should not impede reform. And perhaps we should not be surprised. As Gale (1997) points out, the British tax system has steadily scaled back tax preferences for housing with no noticeable impact on the housing market.

Appendix

Simulation Methods, Functional Forms, and Parameter Values

Solution Method. We solve the model in three steps. First, focusing on percentage changes we work with a version of the model in which the variables of interest (for example, housing prices and quantities) are entered as logarithms. Next, we linearize (in logs) the model in the vicinity of the postreform steady-state values and compute our simulations with the linearized version. Finally, we compute our perfect-foresight transition paths. Specifically, using an iterative search, we calculate the initial decline or jump in asset prices such that the entire subsequent sequence of changes in asset prices leads precisely to the postreform steady state.
**Functional Forms and Parameter Values.** The basic parameters are shown in panel A of table 4-A1. We assume that the representative homeowner faces a property tax at a rate of 1.4 percent and that maintenance and depreciation average 3.0 percent of the house value. Also, we assume that the service flow and housing stock are linked by the constant elasticity function

\[ S = S_c H^n \]

where \( n \) is a constant and \( \epsilon < 0 \) is the inverse price elasticity of demand. Our settings for the parameters of the function are also shown in the table. For our baseline simulations, we choose the (inverse price) elasticity of demand for housing services to be \( \epsilon = -2.0 \), but we vary this value between -0.5 and -3.0 to gauge the impact of this parameter on the simulations. On the supply side, we use a baseline elasticity of construction with respect to \( P_H (\eta) \) of 0.8. Again, however, because the responsiveness of new construction to the alterations in the tax regime would be central to the dynamics of the housing market, we vary this elasticity between 0.1 and 0.9.

We model two reforms: (1) a partial reform, eliminating the deductibility of mortgage interest and property taxes, and (2) the variant of the flat tax proposed by Congressman Armey and Senator Shelby. For purposes of comparison, we follow closely the choices of Capozza, Green, and Hendershott (1996) in choosing our numerical parameter values for these reforms, shown in panel B of table 4-A1.

We set the nominal pretax interest rate at 7.5 percent and assume that the tax reform does not affect it. Considerable debate concerns the impact of tax reform on interest rates; our goal is to focus on the act of reform itself and abstract from ancillary economic impacts. *Ceteris paribus*, that choice likely serves to maximize the negative impacts of tax reform because any reduction in interest rates would raise housing values. Following Capozza, Green, and Hendershott, we set the average marginal tax rate in the current system at 0.22. When simulating the effects of removing deductions in a revenue-neutral framework, we again follow their guidance and employ a rate of 0.194. We set the tax rate for the flat tax at 0.17.

As noted in Capozza, Green, and Hendershott, roughly 40 percent of homeowners do not itemize; we set the fraction of mortgage interest and property tax deductible equal to 0.60. Because none of the reforms would allow a deduction for mortgage interest, we set \( \Theta = 0 \). Similarly, property taxes lose their deductible status under both reforms examined.

The next two rows of the table show the financing and construction cost of housing, respectively. To focus on the real valuation of assets, we fix the loan-to-value ratio (\( \beta \), above) at 0.4 throughout. We assume that the (normalized) replacement cost of a unit of housing is exogenously set at 1.0. Under the flat tax, the business-level tax raises the tax-inclusive break-even replacement cost
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Property tax rate $t_p$</td>
<td>0.014</td>
</tr>
<tr>
<td>Housing supply elasticity ($\varepsilon$)</td>
<td>0.8</td>
</tr>
<tr>
<td>Inverse price elasticity of demand ($\eta$)</td>
<td>-2.0</td>
</tr>
<tr>
<td>Maintenance and depreciation ($m + \delta$)</td>
<td>0.03</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Original</th>
<th>Deductibility Removed</th>
<th>Flat Tax</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest rate ($i$)</td>
<td>0.075</td>
<td>0.075</td>
<td>0.075</td>
</tr>
<tr>
<td>Average marginal income tax rate ($\tau$)</td>
<td>0.220</td>
<td>0.194</td>
<td>0.170</td>
</tr>
<tr>
<td>Percent of mortgage interest deductible ($\Theta$)</td>
<td>0.600</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>Percent of property tax deductible ($\gamma$)</td>
<td>0.600</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>Loan-to-value ratio ($\beta$)</td>
<td>0.400</td>
<td>0.400</td>
<td>0.400</td>
</tr>
<tr>
<td>$P_H$</td>
<td>1.000</td>
<td>1.000</td>
<td>1.170</td>
</tr>
<tr>
<td>Percent of interest income taxable ($e$)</td>
<td>0.500</td>
<td>0.500</td>
<td>0.000</td>
</tr>
</tbody>
</table>

The final row of table 4–A1 shows a parameter indicating the fraction of capital income subject to tax ($e$). We choose a prereform value of $e = 0.5$, a choice based on Engen and Gale (1996), which reflects the widespread existence of tax-preferred saving vehicles that permit substantial amounts of interest (and other capital income) to escape income taxation. Because the flat tax would eliminate taxation of capital income, $e$ falls to zero.

Notes

1. DRI estimates the value of the mortgage interest ($62 billion) and property tax ($22 billion) deductions at $84 billion annually. With a real discount rate of 0.05, the value of that in perpetuity would be $1.7 trillion.

2. As the key to that result, the tax is not levied on existing housing—such an assumption seems sensible. First, the exemption of existing housing is characteristic of most reform proposals. Moreover, if a tax on housing were politically palatable, the current tax benefits for housing would not have survived to this day.

3. In equilibrium, the purchase price of a house is equal to the present...
value of the future consumption stream. Hence, a tax on the purchase price is equivalent to "prepaying" a stream of future taxes on the annual consumption value.

4. The equivalence between the retail sales tax and the VAT is perhaps most easily seen by viewing the VAT as a multistage collection mechanism for the tax on the final product.

5. Another possibility is a "consumed income tax" administered entirely at the household level, but political realities appear to preclude this approach. Thus, for example, we do not address the USA tax of Senators Nunn and Domenici.

6. See Bruce and Holtz-Eakin 1998 for a more detailed description of the numerical simulation model underlying the discussion.

7. It is traditional to treat the capital gain on housing as effectively untaxed (see, for example, Rosen 1985). The most recent tax bill (the Taxpayer Relief Act of 1997) makes it even more likely that capital gains will not be subjected to a tax.

Equation 4–1 ignores the distinction between equity and mortgage financing costs, assumes that all mortgage interest and property taxes are fully deducted, and assumes that interest income is fully taxable. We can relax these assumptions. Let \( \beta \) denote the loan-to-value ratio (that is, the fraction of the house value that is mortgaged), \( \Theta \) the portion of financing costs that are deductible, \( \gamma \) the fraction of property taxes that are deductible, and \( e \) the portion of interest income that is taxable. Then the expression becomes

\[
i[\beta(1 - \Theta \tau) + (1 - \beta)(1 - e\tau)] = \left[ \frac{S(H)}{H + t_p(1 - \gamma \tau) + \delta + m} \right] P_H + \frac{\Delta P_H}{P_H}.
\]

This more exact expression is used in our numerical computations.

8. Both choices ensure revenue neutrality. See the appendix to this chapter.

9. Many observers feel that supply responses in the housing market are asymmetric—increases are more elastic than contractions in supply. Our simulations focus exclusively on scenarios that result in a decline in the stock of housing, and our elasticities are best interpreted in this context.

See Bruce and Holtz-Eakin (1998) for a detailed summary of the sensitivity analysis.

10. The steady-state values are computed by setting \( \Delta P_H = 0 \), determining the long-run value of \( P_H \), and solving for the corresponding value of \( H \).

11. The situation implies a price rise to purchasers but no net gain to builders.

12. Those results are consistent with the findings in static, general equilibrium analyses of housing. Berkovec and Fullerton (1992) estimate that the removal of the deduction for mortgage interest (property tax) would reduce the stock of housing by 2.6 (2.1) percent. Nakagami and Pereira (1996) find that removing the deduction for mortgage interest would reduce housing wealth by less than 1 percent.
13. Our simulations do not incorporate the existence of the standard deduction and thus overstate the loss from the removal of deductions.
14. Again, the net-of-tax price of new housing would initially decline; the incentive is exactly what is required to induce a contraction in the supply of housing.

References

Bruce and Holtz-Eakin have produced one of the few fully integrated analyses of a topic that generates tremendous controversy. The underlying model provides a rigorous analysis of how fundamental tax reform would affect the housing market. By integrating housing supply and demand and linking the transitional and long-term impacts of tax reform, the model allows the consideration of reforms under constant and plausible conditions.

The authors decompose the shift from the current tax system to a broad-based consumption tax into two parts: (1) a shift from the current system to a broad-based income tax and (2) a shift from a broad-based income tax to a broad-based consumption tax. The first change is captured by removing deductions for mortgage interest and property taxes. The second change is captured by removing taxes on interest income and by modeling a consumption tax with a base including the sale of newly constructed housing, but not sales of already existing housing. It is easiest to follow the results if the consumption tax is thought of as a national retail sales tax, and I use the terms interchangeably here. Nevertheless, all results and intuition would remain the same if the consumption tax took some other form.

My comments on the specifics of the model focus on three issues: (1) the analysis of the effects of removing deductions for mortgage interest and property taxes; (2) the appropriate interpretation of changes in housing prices when shifting from a broad-based income tax to a broad-based consumption tax; and (3) the absence of consideration of effects on land prices. In each case, I believe that the model is overly optimistic regarding the impact of tax reform on housing.

**Effects of Removing Deductions.** Moving to a broad-based income tax by removing the deductions for mortgage interest and property taxes has small effects in the model: housing demand is modeled as a function of the characteristics of the typical homeowner, and only about 40 percent of homeowners itemize their deductions. The market value (selling price) of a house, however, is what a buyer is willing to pay for it, less any taxes and transaction costs. Therefore, the demand for housing should depend on the characteristics of, and deductions taken by, the typical buyer. My guess is that the typical buyer, relative to the typical owner, is more likely to take on a mortgage, have a high loan-to-value ratio, and itemize deductions. If these conjectures are correct, removing the deductions would have a more negative effect on housing prices and quantity than the model indicates.

**Interpreting Changes in Housing Prices under a Consumption Tax.** To analyze the shift from a broad-based income tax to a broad-based sales tax
requires a consistent set of assumptions about how the producer and consumer price levels adjust. The authors assume that the shift to a consumption tax would leave the producer price level constant and would raise the consumer price level (including the sales tax) by the full amount of the sales tax. Under this assumption, the break-even selling price of a newly constructed home rises to \(1 + t\) under the sales tax, from a level of 1 under the income tax, where \(t\) is the tax-exclusive sales tax rate. Since new and old houses are the same product to a consumer, the price of old houses must also rise to \(1 + t\) from 1. As a result, the after-tax nominal value of old housing, which would be exempt under the consumption tax, would rise relative to newly constructed housing, which would be taxed under the consumption tax.

The key point, however, is that the after-tax value of old housing would not rise in value relative to other consumption goods. That is, adjusted for changes in the consumer price level, the after-tax value of existing housing would remain constant. Assume that, before tax reform, all houses cost $100,000 and the consumer price index (CPI) = 1. After the imposition of a 17 percent sales tax, the CPI, including the consumption tax, would be 1.17, under the authors’ assumption that the sales tax would be passed forward to consumers, and existing houses would sell for $117,000. Because the sale of an already existing house would not be taxed, the seller of an existing house would keep the entire $117,000 (ignoring transactions costs). But $117,000 in cash after the sales tax was implemented would buy only as much in consumption goods as $100,000 in cash before the sales tax. Thus, the real value of old houses relative to other consumption goods would not have changed, even though the nominal price of old housing would have increased by 17 percent.

This finding has crucial implications for the model and results. First, if the real value of old housing remains constant relative to other consumption goods, but rises relative to the value of new housing, the real value of new housing must fall relative to other consumption goods.

Second, all price changes resulting from a shift to a consumption tax reported in table 4-1 and figures 4-2, 4-4, 4-6, and 4-7 represent nominal changes based on the assumption that switching to a consumption tax would raise the consumer price level by the full amount of the tax. To obtain the changes in real prices, all those results must be reduced by seventeen percentage points. That adjustment has a dramatic impact on the interpretation of the results.

In the long run, the reported nominal price change of 17 percent in table 4C-1 represents a real change of zero in housing prices. That is consistent with the authors’ assumption that the cost of building a house would stay constant over time. Indeed, that long-term outcome is the only one consistent with the constant costs of replacement and competition in the housing industry.

In the short run, the effects of the reinterpretation are equally important. For example, the transition results for the baseline case in figure 4-2 indicate
that nominal house prices would rise by about 11 percent in the first year after conversion to a consumption tax. By implication, real house prices would fall by about 6 percent because the consumer price level would rise by 17 percent. By similar logic, the example of a low-supply response in figure 4–4 implies a real drop in house prices of about 8 percent in year 1 and a decline of 4 percent after four years. The worst-case scenario in figure 4–6 implies a real price decline of about 28 percent after one year and about 17 percent after seven years. Even ten years after tax reform, the implied real price decline would be about 7 percent.

Nothing guarantees, of course, that a shift to a consumption tax would hold the producer price level constant and would raise consumer prices. In a polar alternative scenario, producer prices would fall by the full amount of the removed income tax, so that the consumer price level (including the consumption tax) after tax reform would equal the consumer price level before tax reform. Under this scenario, the change in real house prices would be the same as noted above. In the long run, nominal housing prices would be constant, rather than rising 17 percent. In year 1 (in the baseline case in figure 4–2), nominal housing prices would fall by 6 percent, rather than rising by 11 percent. Table 4C–1 summarizes the various alternatives for changes in price levels and changes in real and nominal house prices.\(^2\)

**The Role of Land.** The chapter equates owner-occupied housing with housing structures, but housing is really a composite good consisting of a structure and land. The structure is a produced good and has a finite life. In the extreme, land is a pure natural resource with an infinite life. Of course, in practice this extreme definition may not hold: cleared land is a produced good, and the quality of land may deteriorate over time. Nevertheless, for practical purposes, it is worthwhile to think of housing as consisting of two goods that may have different characteristics and different responses to tax policy.

The authors included land in prior work and found that it had only a small
effect on the outcome. They found that land prices would fall by about 2 percent in the years immediately following conversion to a consumption tax and in the long run would rise by 17 percent. However, those figures represent nominal price changes in a model that assumes that consumer prices would rise by the full amount of the consumption tax. Thus, the implied real price change was -19 percent in the first few years and zero in the long run.

Effects of this magnitude should not be surprising. The present value of land that yields an income of $1 per year forever is \( \frac{1}{r} \), where \( r \) is the after-tax interest rate. In the authors' model, the after-tax interest rate rises from 5.85 percent (= .075*(1 - 0.22)) under the income tax to 7.5 percent under the consumption tax. The shift should reduce real land prices by 22 percent, with other factors held constant.

The inclusion of the effect of tax reform on land prices can affect both the short-run and long-run impact of tax reform on housing. Data from the flow of funds indicate that in 1998, land was about 25 percent of the total value of residential structures plus land. Thus, in the short run, a 22 percent decline in the real value of land, coupled with a 6 percent real drop in the value of structures (taken from the baseline scenario in figure 4-2), would suggest a drop in the value of housing (structures and land) equal to 10 percent (= 0.25* 0.22 + 0.75*0.06).

In the long run, any increase in the after-tax interest rate would reduce the value of land. Thus, even if the long-run value of structures remained constant as the authors have assumed, the long-run price of housing (structures plus land) would be expected to fall if the after-tax interest rate rose because of tax reform. For example, if the after-tax interest rate rose from 5.85 percent to 7.5 percent as the authors assume, the real price of housing (structures plus land) would fall by about 5.5 percent (= 0.25*0.22 +0.75*0) in the long run. If the real after-tax rate rose to only 6.5 percent, land would fall by 10 percent in value and the real value of housing (structures plus land) would fall by 2.2 percent in the long run.

In summary, the three issues noted above suggest that in a formal, internally consistent model of the housing market with reasonable parameters, fundamental tax reform could easily generate extreme declines in real house value (structures plus land) in the short run and significant declines in the long run. In particular, based on the considerations above, shifting to a consumption tax would reduce the prices of real housing (structure plus land) by about 7-10 percent initially and by about 2-6 percent in the long run, depending on the response of the after-tax interest rate. Although those outcomes and their side effects would not kill the housing market, they merit serious consideration in formulating tax reform options.

Future research extending the model by considering these issues more completely would be interesting. Other areas of interest are the interactions between rental housing markets and the owner-occupied market, as well as further analysis of an issue that the authors mention but do not pursue:
whether and through what channels large and rapid contractions in the supply of owner-occupied housing could occur.

The remainder of my comment focuses on two issues: the impact of changes in house prices and political aspects of removing tax preferences for housing.

Changes in real house prices, even if relatively small, can be large relative to other effects of tax reform. For example, Gale, Houser, and Scholz (1996) find that under the flat tax, 31 percent of all households would face changes in tax burdens of less than 1 percent of income; an additional 54 percent would face changes of 1-5 percent of income. As a rough estimate, let house value equal about 2.5 times income for a typical family, and assume that in the long run, real house prices would fall by 5 percent because of fundamental tax reform. Under these circumstances, the price of housing would fall by 12.5 percent of income, or several times the direct impact of tax reform on annual tax payments. Of course, the change in house prices would be a one-time phenomenon; nonetheless, the example shows that changes in house values can be an important aspect of the effects of changes in tax policy.

Even if real housing prices did not decline, lower nominal housing prices would raise the likelihood of mortgage defaults. The single best predictor of default is whether a household's outstanding loan balance exceeds its housing equity. A reduction in nominal housing prices would reduce housing equity for all households. That situation raises concerns because most outstanding mortgages are relatively new and thus are likely to have a large percentage of loan value still outstanding. By implication, even relatively modest declines in nominal house values could trigger defaults.

A rough calculation provides an example of the potential for this event. Data from the American Housing Survey show that about 47 percent of outstanding mortgages in the mid-1990s were less than five years old. If the interest rate were 8 percent, a borrower would have paid off 5 percent of the principal on a thirty-year mortgage after five years. Finally, assume that half of all new mortgages have loan-to-value ratios of 90 percent or more. Under these assumptions, a tax reform that reduced nominal housing values by 15 percent would place at least 23.5 percent of mortgage holders in a zero or negative equity position. Even if the average impact of tax reform on housing prices was smaller than that, most analysts agree that the effects of tax reform on house prices would vary considerably across areas. Thus, a significant minority of households could find themselves in a negative housing equity position.

The authors also highlight the political problems of removing housing subsidies. A few comments are relevant here. Changes in the value of the deduction for mortgage interest are nothing new. They occur every time interest rates or tax rates change. As a rough calculation, let the value of the deduction for mortgage interest, per dollar of outstanding loan, be given by the marginal tax rate times the mortgage interest rate. With that definition, table
TABLE 4C–2
Value of Mortgage Interest Deduction, 1980 and 1995

<table>
<thead>
<tr>
<th>Tax Rate Percentile</th>
<th>1980</th>
<th>1995</th>
</tr>
</thead>
<tbody>
<tr>
<td>25th</td>
<td>2.02</td>
<td>1.18</td>
</tr>
<tr>
<td>50th</td>
<td>2.66</td>
<td>1.18</td>
</tr>
<tr>
<td>75th</td>
<td>3.54</td>
<td>1.18</td>
</tr>
<tr>
<td>90th</td>
<td>4.68</td>
<td>2.20</td>
</tr>
<tr>
<td>95th</td>
<td>5.44</td>
<td>2.20</td>
</tr>
<tr>
<td>99th</td>
<td>6.84</td>
<td>2.83</td>
</tr>
</tbody>
</table>

NOTE: The value of the deduction for mortgage interest is assumed to be the product of the mortgage interest rate times the tax rate. Data on mortgage interest rates are taken from the Economic Report of the President. Data on the distribution of marginal tax rates are taken from Burman, Gale, and Weiner 1998.

4C–2 shows that, from 1980 to 1995, the value fell by 50–60 percent for households in the upper half of the income distribution. During this period, both nominal interest rates and marginal tax rates fell significantly.

Moreover, the common assertion that Congress put the deduction for mortgage interest in the tax code to encourage homeownership seems implausible, at best. Deductions for mortgage interest and property taxes were features of the original income tax in 1913, which applied only to the top 1 percent of households. It is difficult to believe that encouraging homeownership among this group was an important public policy goal in 1913.

Nor does the presence of a deduction for mortgage interest seem to affect homeownership rates much across countries. Without that deduction, Canada, for example, has a homeownership rate roughly equal to that in the United States.

Recently, Great Britain conducted a fascinating experiment showing both the political and economic viability of reducing mortgage subsidies. When tax subsidies for most forms of borrowing were eliminated in 1974–1975, subsidies for interest on the principal primary residence were retained, subject to a loan limit of £25,000. No subsidies were provided on second homes. The limit was raised to £30,000 in 1983–1984 and has stayed fixed since. The limit applies to the sum of loans against each property. Mortgage tax relief after 1974 was initially provided at the taxpayer’s marginal income tax rate. More recently, the subsidy has been provided only up to a fixed rate, set at 25 percent and then reduced to 15 percent for new loans in 1998.

The British experience raises several interesting possibilities. First, relief for mortgage interest has been effectively divorced from the tax system.
tory rate of subsidy and the loan limit are independent of marginal tax rates. Second, because the £30,000 limit is well below the average new mortgage loan, mortgage subsidies provide no marginal incentive for most taxpayers. Third, the decline in the value of the mortgage interest subsidy has been gradual, but huge. From 1974 to 1996, the value—thought of as the interest rate times the rate at which the subsidy is taken times the real loan limit—fell by about 90 percent.

Nevertheless, finding much of an effect of the policies on the housing sector is difficult. From 1974 to 1994, homeownership rates, the ratio of mortgage debt to GDP, the ratio of mortgage debt to the housing stock, and the ratio of housing to fixed capital rose faster in the United Kingdom than in the United States. Granted, many other factors affect these trends—the privatization of public housing in Britain in the 1980s being a possible major factor. But the significant reduction in mortgage subsidies when homeownership rates were rising (by thirteen percentage points from 1974 to 1994) may make the events even more remarkable from a political perspective.

The British experience and cross-country evidence that the presence of a deduction for mortgage interest does not greatly influence homeownership rates suggest that the value of subsidies for owner-occupied housing could be reduced under the existing system without significant economic problems. The Bruce and Holtz-Eakin analysis of removing deductions is generally consistent with that result. But the model results, as interpreted above, suggest that fundamental tax reform could have much larger effects.

Notes

1. If a good has a price tag of $100 and a $20 tax is added at the cash register, the tax-exclusive tax rate is 20 percent (20/100). In contrast, the tax-inclusive rate would be 16.7 percent (20/(100+20)).

2. For further analysis of price level changes and tax reform, see Gale et al. 1998.

3. I thank Alex Brill for providing this information.

4. Bruce and Holtz-Eakin note that the value of the deduction should be adjusted downward to account for the fact that only interest payments in excess of the standard deduction provide tax benefits. However, the value of the deduction should also be adjusted upward to account for the fact that if interest payments do exceed the standard deduction, there is an added tax benefit: charitable contributions, state and local tax payments, and other items also become tax deductible. Thus, measuring the value of the deduction as the tax rate times the interest rate, as in table 4-3, may be a reasonable approximation.

5. See Gale 1997 for further discussion.
References


