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Some Macroeconomic Interactions with Tax Base Choice

Jeff Strnad

SOME MACROECONOMIC INTERACTIONS WITH TAX BASE CHOICE

Jeff Strnad*

TWO distinguished and extensive literatures have developed during the past century. First, scholars have explored the normative and positive implications of tax base choice. Perhaps the most prominent branch of this literature centers on the comparison of accretion and consumption taxes.[1] At the same time, economists have produced an extensive literature on macroeconomics that includes consideration of the

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   1. *See, e.g.,* William D. Andrews, *A Consumption-Type or Cash Flow Personal Income Tax,* 87 HARV. L. REV. 1113 (1974); Alvin Warren, *Would a Consumption Tax Be Fairer Than an Income Tax?,* 89 YALE L.J. 1081 (1980).

impact of taxes on short-run fluctuations and long-run growth.[2]

There has been some cross-fertilization in these literatures. Most prominently, economists have studied the economic growth implications of the choice between accretion and consumption taxes in general equilibrium models.[3] In addition, macroeconomic models that consider short-run fluctuations sometimes distinguish between capital income and labor income taxes.[4] Despite these instances, the macroeconomics literature ignores many of the detailed differences between different tax bases.

This article attempts to deepen the cross-fertilization between macroeconomics and tax base theory. Part I presents some basic macroeconomic background. Part II considers the macroeconomic implications of various tax bases: an accretion tax, a realization-based tax similar to the current U.S. system, a cash flow income tax, and various hybrid systems. Part III summarizes the discussion in Part II, presents some qualifications, and states some goals for future research.

This article is conceptual. I do not proceed by formally embedding taxes in one or more formal macroeconomic models. Ultimately, this step is necessary since it is reasonable to expect that taxes will trigger complex intertemporal interactions that affect current and future prices. The informal approach used in this article means that most or all of the conclusions about the macroeconomic side effects of various tax bases in Part II are very tentative.

I. MACROECONOMIC BACKGROUND

A. A BRIEF REVIEW OF SOME MAJOR MACROECONOMIC THEORIES

Prior to the Great Depression in the 1930s, macroeconomics was not a distinct economic field. The idea that the national or world economy might sustain long and costly bouts of unemployment or underutilization of capital resources absent government restraints on the price and market system was foreign to most economists. What we now call the "classical" view of macroeconomics was prevalent: Prices would adjust in goods, labor, and capital markets rather quickly to clear those markets. Sustained, "involuntary" unemployment would not occur. There was no reason to have a distinct field called "macroeconomics." Microeconomic price theory would explain aggregate outcomes. This view lead to the so-called "classical dichotomy," the idea that nominal prices and the nominal

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2. *See, e.g.*, N. GREGORY MANKIW, MACROECONOMICS (4th ed. 2000); DAVID ROMER, ADVANCED MACROECONOMICS (1996).

3. *See, e.g.*, ALAN J. AUERBACH & LAURENCE J. KOTLIKOFF, DYNAMIC FISCAL POLICY (1987); Kenneth L. Judd, *The Impact of Tax Reform in Modern Dynamic Economies, in* TRANSITION COSTS OF FUNDAMENTAL TAX REFORM (Keven A. Hassett & R. Glenn Hubbard eds., 2001).

4. *See, e.g.*, R. Anton Braun, *Tax Disturbances and Real Economic Activity in the Postwar United States*, 33 J. MONETARY ECON. 441 (1994); Jeremy Greenwood & Gregory W. Huffman, *Tax Analysis in a Real-Business-Cycle Model: On Measuring Harberger Triangles and Okun Gaps*, 27 J. MONETARY ECON. 167 (1991); Ellen R. McGrattan, *The Macroeconomic Effects of Distortionary Taxation*, 33 J. MONETARY ECON. 573 (1994).

money supply could have no effect on the real economy: real output, employment, or interest rates.[5]

The full-blown classical viewpoint fell out of favor in the face of the Great Depression, which involved many years of sustained high levels of unemployment and underutilization of capital resources. "Keynesian" theories (and the distinct field of macroeconomics) evolved, relying heavily on nominal rigidities, the failure of nominal prices to change quickly enough to clear markets. These theories suggest a role for government that extends beyond merely providing a legal structure in which markets can operate effectively. In particular, governments may use fiscal and monetary policy to "stabilize" the economy. Since prices are sticky, governments will face inflationary environments where aggregate demand exceeds aggregate supply and "recessions" where aggregate demand falls short of aggregate supply, resulting in "involuntary" unemployment and falling nominal prices.

Fiscal policy involves influencing aggregate demand by adjusting government spending or taxes. Thus, in the face of a recession, the government might enact a tax cut or a temporary increase in government spending to stimulate aggregate demand. Monetary policy involves government manipulation of the money supply. When nominal prices are sticky, nominal injections of money will stimulate aggregate demand. In modern economies, monetary authorities often target interest rates or inflation rather than the money supply itself. But, achieving the targets involves changes in the money supply. For example, the Federal Reserve Board ("the Fed"), the monetary authority in the United States, targets the Federal funds rate. If the rate is above the target, the Fed will purchase Federal debt obligations in so-called "open market operations," driving rates down and injecting money into the economy—and thereby increasing the nominal money supply. These open market operations have been very effective at moving the Federal funds rate to the Fed's target rate.[6]

As Keynesian theories evolved, economists blended in elements of the classical approach. The idea was that Keynesian models describe the short-run but that prices adjust in the long-run. In the 1980s, "real business cycle" models evolved. These models are often called "neoclassical" because they do not rely on nominal rigidities. The models study the propagation of various shocks (especially technology shocks) in an economy where prices adjust instantaneously. Fluctuations occur because net

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5. *See* MANKIW, *supra* note 2, at 186-87.

6. *See* ROMER, *supra* note 2, at 396-97, 417. It is worth emphasizing that this high degree of effectiveness pertains only to *nominal* rates. Many studies question whether macroeconomic policy instruments can have any more than a temporary effect on real rates. See *id.* at 225-26 (summarizing arguments by some economists that in the long run, real variables are impervious to policy instruments such as the money supply); Marianne Baxter & Robert G. King, *Fiscal Policy in General Equilibrium*, 83 AM. ECON. REV. 315, 320-22, 324-25 (1993) (temporary and permanent shifts in government purchases cause only a temporary change in the real interest rate).

investment and similar aggregates can adjust only gradually to the shocks. The models can explain much (but not all) of the observed fluctuations in aggregate economies. Major weaknesses of these models include the heavy reliance on technology shocks and the failure to incorporate monetary shocks and other phenomena associated with nominal rigidities.[7] Recent work has attempted to augment the models in a way that captures monetary shocks, aiming toward a "New Neoclassical Synthesis."[8]

Although this article will not include sophisticated modeling, the discussion in Part II does assume some familiarity with the most basic models. To that end, the next two subsections examine a simple Keynesian model and discuss in more detail how real business cycle models work.

1. A Simple Keynesian Model

Perhaps the best-known elementary Keynesian model is the "IS-LM Model."[9] This model is based on three relationships:

$Y = C(Y,T) + I(r) + G$ IS Equation

$M / P = L(r,Y)$ LM Equation

$P = \bar{P}$ Prices Fixed

where the symbols stand for the following variables:

Y output (national income)
C consumption
G government expenditure
T taxes
M nominal money supply
L money demand function
P price level
I investment
r the nominal interest rate.

The first equation is called the IS equation because it can be rewritten in "investment/saving" form: $I = Y - C - G = S$ where S is saving. This equation expresses the idea that savings must equal investment in a closed economy. The second equation equates the real money supply with the demand for real balances.

The IS and LM relations determine aggregate demand for a given price level in a way that is described below. The intersection of the aggregate demand curve and the aggregate supply curve in price/output space determines the price level and the level of output. The diagram below has two separate aggregate supply curves. One, labeled "SRAS," represents

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7. For a more complete discussion, see ROMER, *supra* note 2, at 186-89.

8. *See, e.g.,* M. GOODFRIEND & ROBERT G. KING, THE NEW NEOCLASSICAL SYNTHESIS AND THE ROLE OF MONETARY POLICY (1997).

9. This model is a staple of elementary texts. *See* ROBERT J. BARRO, MACROECONOMICS 757-802 (1997); MANKIW, *supra* note 2, at 256-311. The notation and equations in the text follow the development of the model in the Mankiw textbook. For a briefer, more advanced introduction, see ROMER, *supra* note 2, at 195-205.

"short-run aggregate supply." This curve is horizontal, capturing the Keynesian idea that prices do not adjust in the short-run.[10] The second aggregate supply curve is labeled "LRAS," and represents both the classical view and the long-run under the Neo-Keynesian view. Under the classical view, output is determined by the supply of capital, the supply of labor, and the available technology. Thus, there is a "natural" level of output. In the diagram, this level is two units. Under the Neo-Keynesian view, in the long-run prices are flexible, and output will revert to the "natural" level. The long-run aggregate supply curve ("LRAS") will be vertical, as in the diagram.

The diagram has two aggregate demand curves, labeled "AD1" and "AD2." The latter represents a higher level of aggregate demand. Taking these curves as sequential in time, the shift from AD1 to AD2 may be the result of government policy (increasing G, government spending, or reducing T, taxes) or may arise from various demand shocks (e.g., an increase in consumption or investment due to increased consumer or investor confidence). Assuming the shift is due to government policy, analyzing the impact of the shift illustrates both the classical view and the Neo-Keynesian view. Under the classical view, output is fixed at the "natural" level (2 in the diagram). The change in government policy simply creates an instantaneous jump in the price level. Under the Keyne-
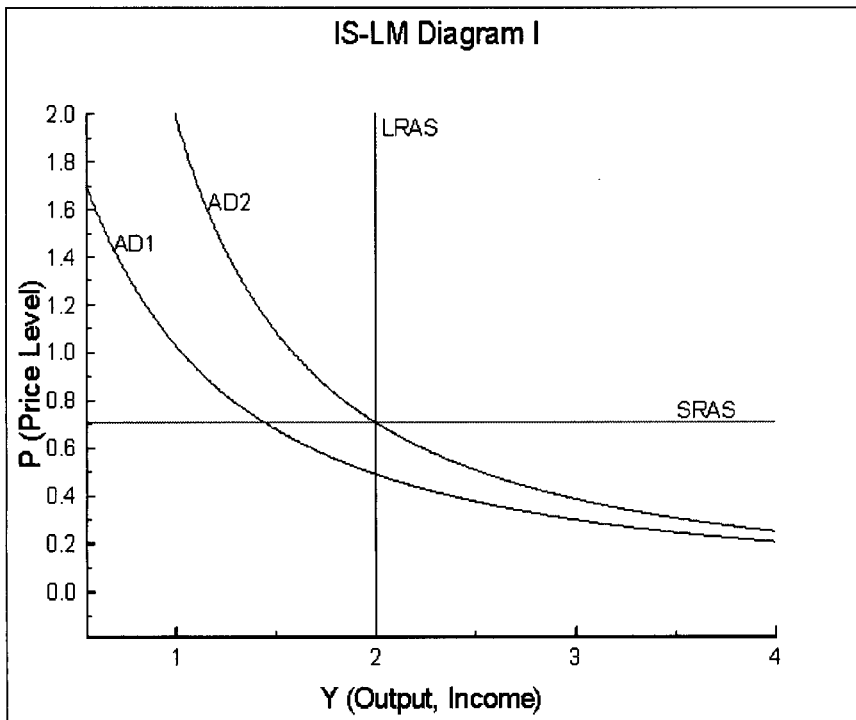
10. The third of the three IS-LM model equations above embodies this idea.

sian view, initially output is depressed, being somewhat less than 1.5 as determined by the intersection of AD1 and SRAS. The government policies inflate aggregate demand enough to move output up to the "natural" rate, as determined by the intersection of AD2 and SRAS. Under the Neo-Keynesian view, in the absence of government intervention, output would correct itself but only with a delay. Prices would adjust but only in the long-run. The economy would move down along the AD1 curve until output reached two units. The SRAS curve would shift down accordingly.

In the IS-LM model aggregate demand is the critical factor. Aggregate demand is determined by solving the IS and LM equations for r (the interest rate) and Y (output) given fixed values for M (nominal money supply), G (government expenditure), T (taxes), and P (the price level). One then varies P, obtaining different values of Y for each P, thereby determining the aggregate demand curve in P-Y space. The operation of the IS-LM framework becomes more transparent if we assume that the IS and LM relationships are linear. In particular, let us rewrite these relationships as:[11]

$$Y = [a + b(Y - T)] + [c - dr] + G \qquad \text{IS Equation}$$

$$M / P = eY - fr \qquad \text{LM Equation}$$

where the coefficients a, b, c, d, e, and f are positive and come from assuming the following linear relationships for consumption, investment and the demand for money:

$$C = a + b(Y - T) \qquad \text{Consumption}$$

$$I(r,Y) = c - dr \qquad \text{Investment}$$

$$M / P = eY - fr \qquad \text{Demand for Money}$$

The coefficient b is the marginal propensity to consume out of income, e represents the sensitivity of money demand to income, and f represents the sensitivity of money demand to the interest rate.[12] Given these linear relationships, one can solve for Y in terms of P and obtain a reduced form equation:

Linear Reduced Form Equation:

$$Y = \frac{z(a+c)}{1-b} + \frac{z}{1-b} G + \frac{-zb}{1-b} T + \frac{d}{(1-b)[f+de/(1-b)]} \frac{M}{P}$$

where

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11. The notation and the final expressions here are from Mankiw's textbook. For the details of the derivation, see MANKIW, *supra* note 2, at 307-10.

12. Two tendencies underlie the intuition behind the money demand equation. First, people will require more money when income is higher since transaction volume will increase. Second, people will economize on money balances when interest rates are high, preferring to hold funds in interest bearing accounts instead of in cash. Thus, e and f are positive.

$$z = \frac{f}{f+de/(1-b)} \; .$$

The coefficients on G and T are the "multipliers" that indicate the increase in Y that results from an additional dollar of government spending or tax reduction.

The following IS-LM diagram shows the (linear) IS and LM curves in r-Y space. It is possible to see from this diagram how the IS-LM intersection generates the aggregate demand curve ("AD") in the diagram above. The IS and LM curves in the diagram indicate the combinations of r and Y representing equilibrium in the goods and money markets, respectively, for fixed values of M, P, T, and G. Decreasing T or increasing G will shift the IS curve out. Increasing M or decreasing P will shift the LM curve down. Fixing M, G, and T while varying P will shift the LM curve around and generate a Y value for each P value chosen. These (P,Y) pairs will generate the aggregate demand curve. In the diagram, there are two LM curves, LM-1 and LM-2. If M is fixed, LM-2 represents the LM curve for a lower value of P. Output increases from 2.5 to 3.0 due to the shift from
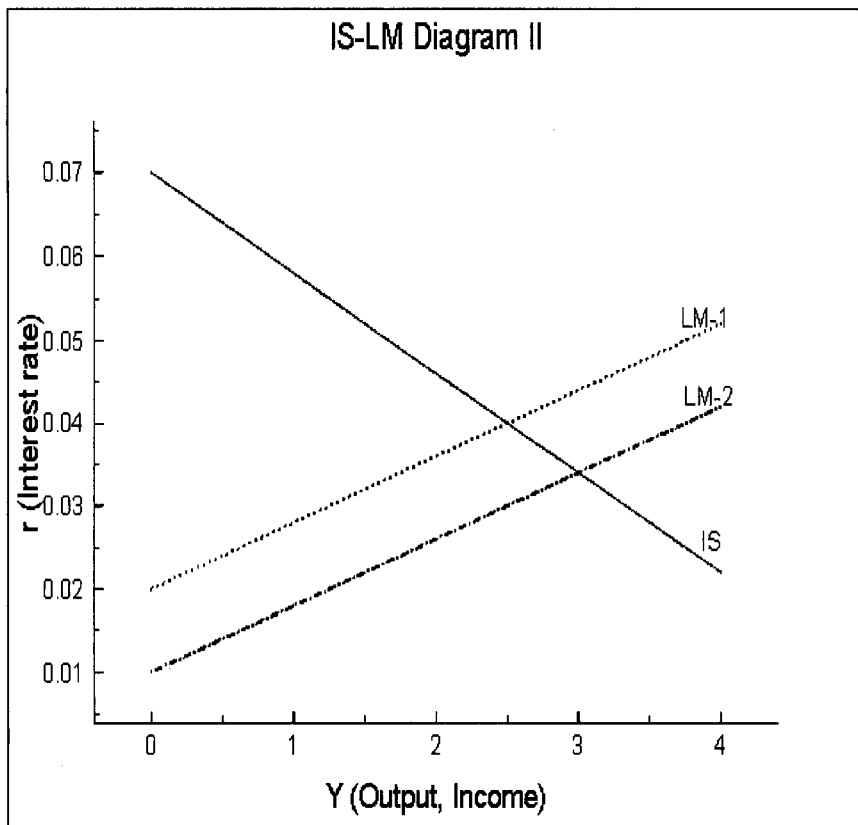
LM-1 to LM-2. A similar shift would result if we held P constant and increased M, the nominal money supply.

An increase in government spending or a decrease in taxes will shift the IS curve out. The following diagram illustrates such a case. The IS curve shifts from IS-1 to IS-2, causing interest rates and output to increase.
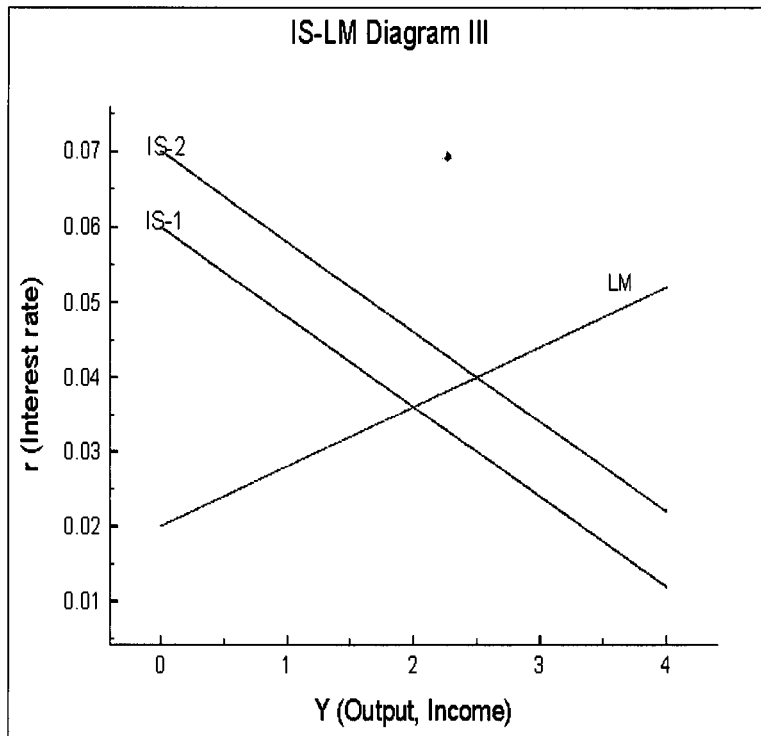
2. Neoclassical Models

A major weakness of the IS-LM approach is that it does not model how the aggregate results emerge from individual behavior. If aggregate relationships change due to changes in individual behavior, the approach will not predict the results. As mentioned above, "neoclassical" real business cycle models evolved in the 1980s. These models use individual optimization as a starting point and include multiple periods. Households choose their intertemporal labor allocation, invest in capital, and consume each period in order to maximize expected utility discounted over all future periods. Labor and capital are paid their marginal product. No price rigidities are present. Technology evolves stochastically, and aggregate labor, capital, and technology combine to determine output in each period.[13]

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13. For a good description of the basic model, see ROMER, *supra* note 2, at 152-68.

Since these models have a rich intertemporal structure, they capture the impact of wealth changes that result from various government policies. To lay a basis for discussion later in the article, it is useful to work through the case of a permanent increase in government expenditure. This increase decreases the output available for private investment and consumption and therefore decreases private wealth (the discounted present value of private income). Individuals respond by decreasing consumption and leisure, but the increase in labor input increases the marginal product of capital and induces an increase in investment. In the long-run, capital and labor inputs increase, and output is higher. This "capital amplification" effect can cause output to increase by more than the increase in government expenditure.[14]

A temporary increase in government expenditure (e.g., during wartime) tends to have very different effects. Individuals realize that the increase is temporary, and they will dissave to cushion the drop in consumption necessitated by the increased share of the government in national output. Investment declines as a result, in contrast to the increase observed in the face of a permanent increase in government expenditure. Lower investment reduces the capital stock. After the period of high government expenditure is over and labor resources are freed up to produce goods for private consumption, the marginal product of capital is high due to the depleted capital stock. An investment boom follows, and the economy gradually reverts to its state prior to the temporary increase in expenditure. The absence of a "capital amplification" effect in the temporary increase case means that output increases less per dollar of additional government expenditure than in the case where the increase is permanent.[15]

It would be interesting to analyze the implications of different tax base choices for macroeconomic policy using a neoclassical model that includes nominal rigidities and allows for monetary shocks. For simplicity, I limit discussion in this article to somewhat speculative consideration of the likely results that would follow in a more basic neoclassical model, similar to the real business cycle models of the 1980s and early 1990s. The conceptual yield from this approach provides a good starting point for future work using more sophisticated models.

B.   THE ROLE OF INSTITUTIONAL CONSTRAINTS

The institutional environment is particularly important in any study of the impact of tax rules on macroeconomic policy. Monetary and fiscal policy are not instantaneously effective. Scholars have identified two kinds of lags that operate as institutional constraints on the execution of macroeconomic policy. First, there is "inside lag," the time it takes for

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14. For an extremely clear, rigorous development of these results and the corresponding results for a temporary increase in government expenditure, see Baxter & King, *supra* note 6, at 319-26.

15. *See id.* at 325-26.

the government to identify a macroeconomic problem and respond with an appropriate policy. Second, there is "outside lag," the time it takes for the policy change to affect the economy.

In the United States, the Fed implements monetary policy. At the present time, the Fed undertakes this task by targeting short-run interest rates, using open market operations to move the federal funds rate to the target value. The Fed meets formally every six weeks or so and is capable of acting very quickly, even between meetings, if necessary.[16] Fiscal policy (adjusting taxes and/or government spending) usually requires action by Congress with the assent of the President. As a result, the institutional aspect of inside lag is much more serious for fiscal policy.[17] Enacting tax legislation can take several quarters or even years, and it is often an accident that a particular fiscal measure goes into effect with the right timing.[18]

Deliberate adjustments to macroeconomic policy involve delay. A corollary is that the macroeconomic impact of the existing structure of tax, fiscal, and monetary rules is very important. Two closely related features of government policy are particularly significant: "automatic stabilizers" and the "environment effect." Automatic stabilizers are policy elements that create a macroeconomic response in the absence of any deliberate action by a policymaker. A frequently cited example is the fact that income tax collections drop "automatically" when income falls during a recession.[19] In effect, the structure of the law creates a tax reduction that tends to stimulate aggregate demand in the face of a shortfall. Of course, automatic responses may be destabilizing as well as stabilizing.

A second feature is that government policy itself operates in a legal environment that cannot be changed quickly or easily. A good example is U.S. monetary policy. Although the Fed can act quickly, it must take the legal environment as a given, at least in the short-run. This environment includes the existing tax rules. These rules may hinder or advance the monetary efforts of the Fed. This "environment effect" is central to the discussion in the next Part. Choosing a tax base and developing a regulatory structure to implement that tax base takes considerable time, and the system develops a momentum of its own. As a result, choosing a tax base involves a commitment that will constrain the faster acting aspects of government policy that are the logical candidates for addressing

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16. As one prominent macroeconomist notes, "all the Fed Open Market Committee needs to do is have a conference call, vote, and transmit its decision to the New York trading desk where the short-term interest rate is changed." John B. Taylor, *Reassessing Discretionary Fiscal Policy*, 14 J. ECON. PERSP. 21, 27 (2000).

17. The "economic" aspect of inside lag, the delay in recognizing macroeconomic conditions that require a policy response, is a difficult problem for the Fed as well as for Congress. The Fed has accumulated top notch and very deep resources for studying and tracking economic fluctuations. Nonetheless, the Fed often faces considerable uncertainty with respect to the near-term direction of the economy.

18. *See* Taylor, *supra* note 16, at 27, 34.

19. *See, e.g.,* MANKIW, *supra* note 2, at 533; Alan J. Auerbach & Daniel Feenberg, *The Significance of Federal Taxes as Automatic Stabilizers*, 14 J. ECON. PERSP. 37 (2000).

short-run fluctuations. These aspects include fiscal as well as monetary policies. It is plausible that Congress might act quickly to cut rates inside an existing tax system in response to short-term macroeconomic conditions. It is not plausible that Congress would be able to shift the entire nature of the tax system in a short enough time frame to respond effectively.

A convenient conceptualization that emerges from these considerations is that we can assume that tax base choices are fixed in the short-run. Deliberate fiscal policy responses to macroeconomic conditions will consist primarily of changing the rate structure or the level of government expenditures. Similarly, monetary authorities must operate in a setting where the tax base is fixed. They may hope to elicit a short-run rate change from fiscal authorities, but they cannot expect that the fiscal authorities will be able to change the nature of the tax system itself in the short-run. I rely on this conceptualization in the subsequent Parts of this article.

An interesting corollary emerges from this discussion. Suppose that changing rates under two different tax bases has dramatically different macroeconomic effects. It might be advantageous to deliberately mix tax bases (e.g., combining a VAT with an income tax) so that the legislature could choose which tax rate to adjust depending on the macroeconomic problem. Section II.D. develops this idea in more detail.

It is important to emphasize that these institutional constraints are salient only because of the short-run nature of macroeconomic problems. If there is a shortfall in aggregate demand and the world has some Keynesian features, a delayed government response means that some potential output is lost forever.

II. MACROECONOMIC CHARACTERISTICS OF VARIOUS TAX BASES

Sections A and C examine the two leading theoretical tax bases: the accretion tax and the cash flow income tax. Each of these sections begins with an exposition of some basic features of each tax that have significant macroeconomic implications. This exposition includes the neoclassical implications expected to follow from the basic features.[20] Both sections conclude by examining the short-run tendencies of the tax bases in a Keynesian framework. Section B goes through the same steps for a realization-based tax similar to current U.S. law. Section D discusses the use of hybrid tax systems. In doing so, it deepens the discussion of the three tax bases treated in the earlier sections. Some of this deepening is the result of going beyond certain unrealistic aspects of the Keynesian framework employed in the earlier sections.

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20. Because we are using a framework based on the traditional neoclassical model that does not incorporate nominal rigidities or monetary shocks, the discussion is limited to the impact of fiscal policy. Studying monetary policy effectively requires more complex neoclassical variants that include nominal rigidities and monetary effects.

A. THE ACCRETION TAX

1. Basic Features and Neoclassical Implications

A pure accretion tax has a "mark-to-market" feature, imposing or re-bating taxes based on changes in wealth as they occur, whether or not these changes are "realized" through sale or other disposition of the underlying asset. In contrast, a realization-based income tax, such as the current U.S. system, does not tax losses or gains unless and until they are realized. The "mark-to-market" feature of a pure accretion tax leads to the Samuelson Theorem.[21] In its general form, this theorem may be stated as follows:[22]

> SAMUELSON THEOREM: Under a pure accretion tax, the net present value of any investment is independent of the tax rate. In addition, that net present value will not change even if tax rates change in expected or unexpected ways in the future.

Some important intuition underlying this result is evident from examining a perpetuity. Suppose that an investment pays $\$X$ per year forever and that the pre-tax annualized interest rate is r. In the absence of taxes, the present value of the investment is $\$X/r$. Adding an accretion tax at rate T reduces each annual dividend from $\$X$ to $\$X(1 - T)$ and reduces the discount rate from r to $r(1 - T)$. The present value becomes:

$$\frac{X(1-T)}{r(1-T)} = \frac{X}{r}.$$

The reduction in revenues is precisely offset by a drop in the discount rate, leaving the present value the same. If we permanently change the tax rate from T to some other value, T^*, at some future point in time, it will not matter. The same offsetting effects will occur and the present value will remain $\$X/r$. On the other hand, macroeconomic policies or macroeconomic shocks that affect X or r separately or differently will impact the present value of the investment.

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21. *See* Paul A. Samuelson, *Tax Deductibility of Economic Depreciation to Insure Invariant Valuations*, 72 J. POL. ECON. 604 (1964). The result applies to risky as well as riskless investments. *See* G. Fane, *Neutral Taxation Under Uncertainty*, 33 J. PUB. ECON. 95 (1987).

22. Samuelson stated the theorem in terms of "depreciation" and depreciating assets, but, as he notes, the result also applies to appreciating assets. Samuelson, *supra* note 21, at 605-06.

Although Samuelson stated that his result "presupposes a tax rate that is uniform over time for each person," the result applies when tax rates change over time. *Id.* at 605. Net present value for an asset at time t is simply an integral from time t to a terminal time, T, when last cash flow from the asset occurs. *Id.* (equation (3)). Suppose that the tax rate changes at some intermediate time, t^*. The integral becomes the sum of two integrals, one from t to t^* and the other from t^* to T. The Samuelson Theorem clearly applies to both integrals separately. They will have the same value regardless of the tax rate that applies. As a result, the sum also will be invariant even in the case where different tax rates apply to the two integrals. This argument obviously generalizes to the case where the tax rate changes more than once during the period between t and T.

It is evident that a pure accretion tax preserves the power to consume presently in the face of government manipulation of tax rates by insulating the value of existing investments from future tax rate changes.[23] At the same time, the cost of future consumption relative to present consumption is increased because the after-tax interest rate is lower. This price change means that changes in tax rates will tend to cause intertemporal substitution effects, with rate increases leading to reduced saving and investment.[24]

The anticipated impact of the accretion tax in a neoclassical model follows from the features just delineated. Tax rate changes will not have a direct (wealth changing) impact on investment but will have an impact that arises from intertemporal substitution. Saving and investment will fall in the face of higher rates. As a consequence, in the long-run, output and the capital stock will be lower, wages will be lower, interest rates will be higher, and the savings rate will be lower.[25]

2. Short-Run Implications

A first task is to examine the automatic stabilization properties of the accretion tax. Consider two different kinds of shocks: a demand shock that decreases demand and therefore decreases expected revenues for each investment and a monetary shock that increases interest rates. In each case, the shock will result in a drop in the present value of investments and, consequently, tax rebates. Assuming a Keynesian framework, these rebates will have a stabilizing effect, tending to restore aggregate demand in the face of the negative demand or monetary shock.[26]

The flip side of these automatic stabilization policies is that explicit monetary or fiscal policy initiatives will be frustrated. Consider the case

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23. This insulation effect can serve as a commitment device for the government that overcomes problems of time consistency for policies that stimulate investment on an economy-wide basis. If the government provides investment subsidies in period 1 and the investment actually occurs, there will be a temptation to tax the investment returns in later periods. After the investment is sunk, these taxes have no welfare cost since they do not influence behavior. However, if investors suspect that the government will raise taxes in later periods in a way that affects investment value, they will not respond to the subsidies in the first place. The nice feature of an accretion tax is that the government cannot affect the value of the investments through future general tax rate increases. The ability to commit to this tax base depends on the difficulty of amending the tax rules to change tax bases at some later time.

24. Reduced savings and investment ultimately makes capital relatively scarce so that wage rates fall relative to the return on capital. This outcome is a typical feature of income tax variants (including the accretion tax) that reduce the after-tax return to capital.

25. *See, e.g.,* AUERBACH & KOTLIKOFF, *supra* note 3, at 66 (neoclassical model comparing an income tax to a consumption tax).

26. In a traditional Keynesian model, aggregate demand is affected by nominal changes, such as increasing the money supply, even though such changes might have no effect in a rational expectations setting where prices adjust instantaneously. An important issue is whether the rebates will happen quickly enough to have the requisite short-run impact. In a system such as the current U.S. system, most wealth-holding taxpayers are subject to quarterly estimated tax payments. An impact within three months would be rapid enough on a macroeconomic timescale. Monetary and fiscal policy initiatives typically take six to eighteen months to affect the economy.

where the government is using restrictive monetary policy to address excess demand.[27] In the diagram below the initial IS and LM curves are dotted lines labeled IS-1 and LM-1. The government contracts the money supply, thereby shifting the LM curve up from LM-1 to LM-2. This shift reduces output and raises the nominal interest rate. However, under the accretion tax, investors receive tax rebates when a drop in investment value results from the interest rate increase. As a result of this tax reduction, the IS curve shifts out from IS-1 to IS-2. This shift pushes output back up and causes a further increase in the interest rate. Tax rebates under an accretion tax will automatically soften the blow of a contractionary monetary shock, but they also will dampen the impact of deliberate monetary tightening.[28]

IS-LM Diagram IV

r (Interest rate) vs. Y (Output, Income)

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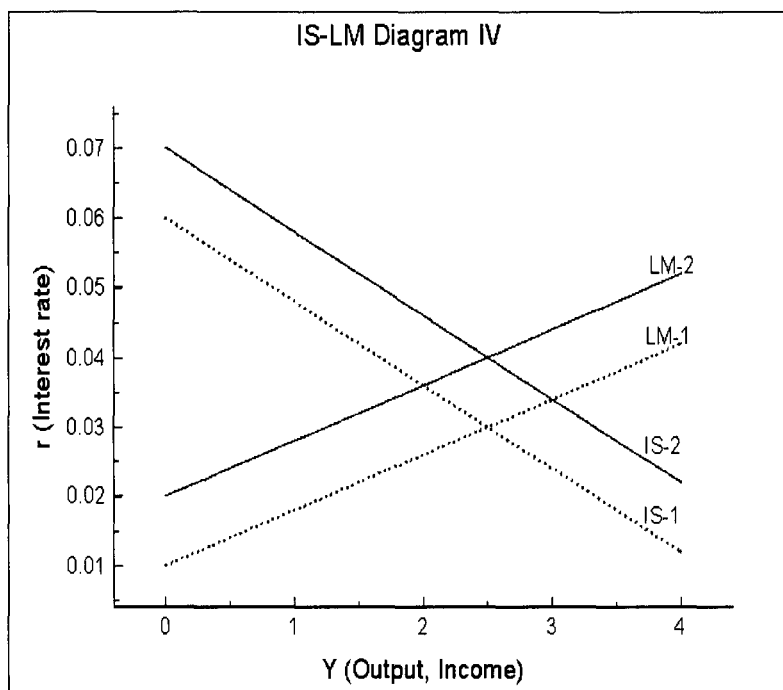
27. In recent years, the monetary authorities in the United States have been primarily responsible for addressing short-run fluctuations. Discretionary fiscal policy has played little or no part. *See* Taylor, *supra* note 16, at 27-28.

28. The various macroeconomic properties of the accretion tax suggest that it might be an ideal tax system when citizens want to restrict the government's role in overseeing the economy. The tax blocks any effect of tax rates on investment value and tends to offset any attempt by the government to manage the economy in the short-run through fiscal or monetary policy. In addition, the tax tends to stabilize the economy automatically in the face of monetary or real shocks, reducing the need for government intervention.

The salience of this picture depends on which taxes are the subject of comparison. The picture is particularly apt when comparing the accretion tax to a realization-based tax. It is the mark-to-market feature of the accretion tax that is driving the macroeconomic effects discussed so far. The realization-based tax is (approximately) equivalent to an accretion tax without this feature.

A final issue to examine is the impact on short-run policy effectiveness of the (long-run and short-run) reduction in the after-tax interest rate under a regime of accretion taxation. The easiest way to proceed is by examining the coefficients of the Linear Reduced Form Equation above.[29] The accretion tax reduces the interest rate by the proportion (1 - T). This reduction causes the coefficients d and f in the investment demand and money demand equations to fall by the same proportion. But changing d and f by the same proportion leaves z and all the coefficients in the Linear Reduced Form Equation unaffected.[30]

However, there is another effect to consider. Taxes that reduce the interest rate on an after-tax basis tend to reduce the savings rate.[31] This reduction means that the marginal propensity to consume, represented by b in the Linear Reduced Form Equation, will be higher. The impact of a higher marginal propensity to consume is to increase the efficacy of both fiscal and monetary policy.[32]

B. A REALIZATION-BASED TAX APPROXIMATING CURRENT U.S. LAW

1. *Basic Features and Neoclassical Implications*

Only a few elements of the current U.S. tax system resemble an accretion tax. Certain financial market participants are taxed on a mark-to-market basis.[33] In addition, the taxation of interest rate instruments has a significant accretion-based component.[34] But most other investment vehicles are taxed on a realization basis. The system also includes a step-up in basis at death, allowing gains held until that time to escape taxation entirely. Another departure from a pure accretion tax is the isolation of investment gains and losses in a separate "basket." Only very limited amounts of investment loss may be used to offset income other than in-

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The comparison between the accretion tax and the cash flow income tax involves an additional complication: The reduction in the saving rate under an accretion tax compared to the cash flow income tax may increase the effectiveness of fiscal and monetary policy. *See infra* text accompanying note 38.

29. *See supra* text following note 12.

30. This argument ignores the possible impact of a progressive rate structure. If investment demand is determined by individuals in higher brackets than those who are crucial for the demand for money, the effect will be similar to reducing d more on a proportional basis than f. This change in the coefficients will increase z and decrease the coefficient of M/P in the Linear Reduced Form Equation. As a result, fiscal policy will be more effective and monetary policy less effective than in the absence of the tax.

31. *See, e.g.*, AUERBACH & KOTLIKOFF, *supra* note 3, at 66.

32. The algebra follows directly from the Linear Reduced Form Equation, taking into account how b affects z. The intuition behind the result is obvious: If the marginal propensity to consume is higher, then, in a Keynesian framework, putting a fixed number of dollars into peoples' hands via fiscal or monetary means will result in a bigger increase in consumption and a bigger feedback effect that increases national income.

33. *See, e.g.*, I.R.C. § 1236 (2002) (securities dealers); I.R.C. § 1256 (2002) (investors in regulated futures contracts, foreign currency contracts, and nonequity options; dealers' equity option investments).

34. For example, interest is accrued and taxed on bonds issued at a discount (due to coupons set at below market rates), a method that approximates accretion taxation. *See* Jeff Strnad, *The Taxation of Bonds: The Tax Trading Dimension*, 81 VA. L. REV. 47, 50 (1995).

vestment gain.[35] Losses that are not used currently may be carried forward indefinitely, but they retain their character as investment losses.

In the face of all these rules, the optimal strategy at the personal level is to hold gains until death to the extent possible and to accumulate an inventory of losses to offset gains in situations where the gains must be realized or where it is advantageous to do so for portfolio balancing or other reasons.[36] A good first approximation at the personal level is that debt instruments (which determine interest rates) are taxed, but other investments are outside the tax system. No gains will be taxed for those investments, and losses from the investments will have no tax value (other than extinguishing the gains in certain instances). Since most investments will be in corporate form, we assume that there will be a corporate profits tax.

Under this approximation, the tax system will lower the after-tax interest rate and will subject revenues to taxation on a cash flow basis as in the case of an accretion tax. Unlike an accretion tax, however, gains and losses on wealth holdings will not have any tax consequences. As a result, the Samuelson Theorem will not apply.

The impact of this realization-based tax in a neoclassical model follows from the (approximate) features just delineated. One feature will be similar or the same as under an accretion tax: Tax rate changes will induce intertemporal substitution. In particular, saving and investment will fall in the face of higher rates; and, in the long-run, output and the capital stock will be lower, wages will be lower, interest rates will be higher, and the savings rate will be lower. However, there is a new twist associated with the realization-based tax. Since the Samuelson Theorem does not apply, tax rates changes will have wealth effects. Given that the expected return on investment assets is positive, the average effect of this feature is that taxes on gains will be deferred until revenue flows occur. As a result, an increase in tax rates will cause an *increase* in the present value of wealth holdings.[37] This increase will have the usual effects in a neoclassical model: Individuals will increase consumption and leisure, moves which tend to reduce output in the model. These effects will enhance the effects that arise from intertemporal substitution.

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35. *See* I.R.C. § 1211 (2002) (limitation on use of capital losses against other income; no exception for corporations; limited exception ($1,500 to $3,000 per year) for non-corporate taxpayers).

36. For a technical discussion of loss-taking strategies, see George M. Constantinides, *Capital Market Equilibrium with Personal Tax*, 51 ECONOMETRICA 611 (1983); Robert M. Dammon & Chester S. Spatt, *The Optimal Trading and Pricing of Securities with Asymmetric Capital Gains Taxes and Transaction Costs*, 9 REV. FIN. STUD. 921 (1996).

37. This result may seem strange, but there is a simple explanation. The realization-based tax reduces the after-tax discount rate, which will increase present value for a typical investment asset. In the case of an accretion tax, this increase is exactly offset by the impact of taxing cash flow revenues and unrealized gains. The realization-based tax removes the levy on unrealized gains, leaving a positive net impact on present value.

2. *Short-Run Implications*

The realization-based tax removes the tax rebates for unrealized losses and the tax levies for unrealized gains that occur under the accretion tax. In addition, it is approximately true that realized gains and losses have no tax consequences. As a result, the automatic stabilization features of the accretion tax are absent, but on the flip side, the rebates and levies do not interfere with monetary or fiscal policy as they do in the case of an accretion tax.

The reduction in the after-tax interest rate under the realization-based tax will have the same impact as it does under the accretion tax. The savings rate will fall, and the marginal propensity to consume will increase. In a Keynesian framework, both monetary and fiscal policy will be more potent.[38]

Tax theorists tend to view the realization requirement as a compromise stemming from the practical desire to avoid having to value assets periodically, especially assets that lack an implicit valuation that is evident in public markets.[39] This compromise is costly because imposing a realization requirement creates tax avoidance possibilities that the law must address. For instance, the provisions that cabin investment losses along with investment gains in an investment "basket" are necessary in a realization-based system to block taxpayers from zeroing out their non-investment taxable income by selectively realizing losses. Provisions of this sort, though necessary, often complicate the tax laws. It is clear, however, that a realization-based system may have some significant macroeconomic advantages compared to an accretion tax. Although the accretion tax creates some extra automatic stabilization compared to a realization-based system, it also fetters discretionary government fiscal and monetary policy. If one views this trade-off as a net negative, then one might favor a realization-based tax on macroeconomic grounds.

C. THE CASH FLOW INCOME TAX

1. *Basic Features and Neoclassical Implications*

A cash flow income tax has very different macroeconomic characteristics from an accretion tax. The Samuelson Theorem applies for an accretion tax so that the pattern of future tax rates will have no impact on the present value of investments. In effect, the government cannot influence investment value for good or for ill through tax-based fiscal policy, at least in the short-run.[40] In contrast, the cash flow income tax gives the government tremendous power to influence the timing of investment.

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38. *See supra* text accompanying note 32.

39. *See* MICHAEL J. GRAETZ & DEBORAH H. SCHENK, FEDERAL INCOME TAXATION 159-60 (3d ed. 1995) (characterizing the realization requirement as a "necessary evil").

40. Rate changes under an accretion tax will have a long-run (and ultimately significant) effect on investment through its impact on intertemporal substitution. An increase in tax rates will tend to reduce saving, lower the capital stock, and (in the long-run) increase the required pre-tax return to capital. This required increased pre-tax return increases the

Under this tax, investment cost is expensed initially and revenues are taxed when they occur at the rate that prevails *at that later time.* An un-anticipated *temporary* increase in tax rates will spur an investment boom. Investments undertaken immediately will receive a much bigger tax bene-fit since investment cost will be deducted when rates are high. Revenues will flow in later, at the lower rate that prevailed prior to the temporary increase.[41]

It is instructive to contrast an unanticipated temporary increase with an unanticipated permanent increase. A cash flow income tax at a perma-nent rate T amounts to government ownership of the proportion T of all assets in the economy. To see this point, consider the perpetuity of $\$X$ per year forever when annual interest rates remain constant at rate r. This perpetuity has a present value of $\$X/r$ on a pre-tax basis. A cash flow income tax at rate T will reduce annual revenues to $\$X(1 - T)$ from $\$X$ but will have no impact on the interest rate. As a result, the present value of the perpetuity will be $\$X(1 - T)/r$ instead of $\$X/r$ in the absence of taxes. The tax has reduced present value by $\$XT/r$, the present value of the government's revenue stream. In effect, the government has pur-chased or expropriated the proportion T of the perpetuity. The "purchase" case occurs if the taxpayer invested in the perpetuity when the cash flow rate was T. The taxpayer would have deducted the cost, $\$X/r$, receiving a payment (in the form of reduced taxes flowing from the deduction) of $\$TX/r$ from the government. If the government imposed the cash flow tax after the investment was made, the government will have expropriated the proportion T of the investment by imposing the tax without allowing a corresponding deduction for cost.

A permanent increase in cash flow tax rates expropriates wealth from investors. If the increase is from T to T^*, then the government is expro-priating a proportion $(T^* - T)$ of all wealth-holdings in the economy, in-cluding human capital. If the tax rate increase is unanticipated, it will not affect the incentive of the taxpayer to invest directly. The investor still will earn r on new investments and on existing investments. There will be an indirect effect, however, stemming from the sudden drop in private wealth.

It is worth noting that these powerful fiscal tools also are fragile and subject to time inconsistency problems. For example, a temporary rate

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pre-tax discount rate for investments, allowing equilibrium to obtain with a smaller capital stock.
    41. Not all investments involve a single initial net outlay followed by revenues. But the general idea still applies: Taxpayers will want to shift investment outlays into the high tax period. Under a cash flow income tax with progressive rates, a temporary rate increase will exacerbate or alleviate tax administration problems unless all rates increase by the same number of percentage points. For example, if the spread between low bracket and high bracket rates increases, there will be an added incentive for the high bracket taxpayer to prepay for goods (including investment goods) purchased from the low bracket taxpayer even if physical delivery of the goods is not accelerated. This prepayment results in an earlier net tax benefit from the government when the two parties are considered together. The net tax benefit is larger when the rate difference is larger.

increase will induce an investment boom only if the temporary nature of the increase is credible. The potential time inconsistency problem will arise if after the new investment is on line, the rates are not dropped down to their previous levels. This will result in the expropriation of private wealth in a manner much like a lump sum tax, with no welfare consequences. The optimal policy at that later time is *not* to decrease the rates and to substitute the lump sum tax for taxes (such as taxes on labor income) that are distortionary. If taxpayers anticipate this phenomenon and the government cannot commit itself to the temporary increase either mechanically or through a credible reputation-sensitive strategy, then taxpayers will assume that the "temporary" increase is in fact permanent and the nice recession-killing investment boom will not take place. Exploiting the fiscal power of a cash flow income tax requires a high level of government maturity and credibility.

The impact of a cash flow tax in a neoclassical setting hinges on the wealth effects of the tax. An unanticipated permanent increase in rates will drop private wealth holdings. This drop will tend to decrease consumption and leisure and increase output. However, raising rates on consumption also will create substitution effects as taxpayers will tend to substitute leisure for consumption at present and in all future periods. The resulting drop in labor supply may offset the increase induced by the wealth effect, and output may fall rather than rise.[42]

An unanticipated temporary increase in rates will induce an investment boom as described above. There will be an important intertemporal substitution effect: Taxpayers will want to shift consumption from the present to future periods when the tax cost is lower.[43] This effect will make "room" for the investment boom by giving scope for additional saving in the short-run. There also may be some short-run substitution of leisure for consumption. When rates revert to normal levels, there may be an investment "bust" if the capital stock is artificially high and rates of return are depressed.

2. Short-Run Implications

Under a cash flow income tax, unrealized gains and losses have no tax consequences. Thus, the extra degree of automatic stabilization and the impediment to government monetary and fiscal policy that arise from the

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42. An important point that emerges from this discussion is that distortions due to raising tax rates can reverse the effects that stem from the drop in private wealth that occurs because the added taxes take resources out of the private economy. For a more developed example of the same phenomenon, see Baxter & King, *supra* note 6. Baxter and King demonstrate that an increase in government expenditures financed by distortionary taxes may create a significant drop in output even though an increase in government expenditures financed by lump-sum taxes would significantly increase output. *See id.* at 327-28.

43. This intertemporal substitution effect on consumption in different periods is absent in the case of an unanticipated permanent rate increase. That increase has the same impact on the after-tax price of both present consumption and future consumption, leaving relative prices of consumption in different periods unchanged.

mark-to-market feature of an accretion tax will be absent under a cash flow tax.

The cash flow income tax will result in a higher after-tax interest rate than under an accretion tax or realization-based tax. As a result, the savings rate will be higher and the marginal propensity to consume will be lower. In a Keynesian framework, the result will be that both monetary and fiscal policy will be less potent.[44]

D. HYBRID TAX SYSTEMS

From a macroeconomic standpoint, hybrid tax systems have very interesting and potentially useful characteristics. We will examine these characteristics initially from a short-run Keynesian viewpoint. Consider a system that applies a cash flow income tax to some taxpayers or asset classes (the "CFIT sector") and an accretion tax to the rest (the "accretion tax sector").

The accretion tax sector would be relatively immune to shocks because unrealized losses and gains would have tax consequences. A shock with a negative revenue impact in this sector would cause asset values in the sector to drop, leading to tax rebates. This sector also would be relatively immune to government monetary and fiscal policy. Any action the government might take will be offset by increased taxes or tax rebates resulting from shifts in asset values.

The CFIT sector would not enjoy the same "automatic stabilization" and immunity from government policy. Fiscal policy applied specifically to the sector (e.g., temporarily increasing or lowering the cash flow tax rate that applies to the sector) would have a very powerful impact on the sector. However, this fiscal policy would impact investment flows to and from the other sector. For instance, a temporary, one-year CFIT rate increase would cause an investment boom in the CFIT sector. But some of the induced investment in the CFIT sector might be at the expense of investment in the accretion tax sector rather than being "new" net investment for the economy as a whole. The government would have to simultaneously lower tax rates in the accretion sector in order to prevent outflow of investment from that sector. The tax rate drop may need to (credibly) last more than one year. Otherwise, taxpayers might cannibalize long-term investment in the accretion tax sector in order to take advantage of the temporarily low after-tax cost of long-term investment in the CFIT sector. One way around this problem would be to combine the temporary tax increase in the CFIT sector with a temporary investment tax credit in the accretion tax sector. This investment tax credit might be financed in whole or in part from the extra tax revenues flowing from the

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44. *See supra* text accompanying note 32. Under a cash flow income tax, the additional saving and investment compared to an accretion tax or a realization-based tax will gradually reduce the pre-tax rate of return. However, the steady state (long-run equilibrium) savings rate typically remains above the rate that would apply under an accretion or realization-based tax. *See, e.g.,* AUERBACH & KOTLIKOFF *supra* note 3, at 66.

temporarily higher CFIT rate.[45]

The aggregate effect on economy-wide fiscal and monetary policy would be a mixture of the effects from a pure accretion tax and a pure cash flow income tax. The aggregate saving rate and the marginal propensity to consume under a hybrid tax would tend to be at values between the values that would obtain under either pure tax. One would expect the effectiveness of monetary and fiscal policy to be impaired more under the hybrid tax than under the comprehensive accretion tax, but the impairment under the hybrid tax should be less than under a comprehensive cash flow income tax.[46]

The potential macroeconomic advantage of the hybrid tax comes from the ability to place individuals or industries into different tax regimes. Some sectors or individuals may have higher adjustment costs in the face of demand or output fluctuations and may not be able to insure effectively against such fluctuations. Similarly, there may be higher welfare costs if particular identifiable classes of individuals face the consequences of fluctuations without the ability to insure. It would make sense to assign these individuals or industries to the accretion tax sector since that sector is relatively immune to macroeconomic shocks and to the side effects of government fiscal and monetary policy.

In order to make the case that this type of policy has value, it is important to take into account the availability of capital markets to individuals, firms, and the government. It is useful to examine two different cases: "Aggregate" fluctuations in output or demand that impact all sectors and individuals (causing a global boom or recession) and "isolated" fluctuations that primarily impact individual sectors. In the case of aggregate fluctuations, capital markets would seem to provide adequate possibilities both for insurance and for intertemporal smoothing. Consider a global recession. The risk of such a recession is an aggregate risk that cannot be diversified away, and, as a consequence, individuals or firms will have to pay a premium to insure against that risk.[47] Nonetheless, in a perfect

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45. Revenues accruing during the high tax year from investments already in place at the beginning of that year would be taxed at a higher rate. There is a problem that will arise under a hybrid tax that would be absent under a comprehensive flat-rate CFIT. Faced with a one-year temporary tax increase, taxpayers will be tempted to manipulate the timing of cash flows to shift receipts out of the high tax year. Under a comprehensive flat-rate CFIT, this maneuver will not work. Shifting a receipt out of the high tax year for the receiving taxpayer removes a deduction in that year for the payor. If both taxpayers are subject to the same rate, the manipulation will be a wash in aggregate. However, in a hybrid tax setting, CFIT taxpayers could delay their receipts from accretion sector payors. Delay of the payment will have at most a trivial effect (a time value of money impact over the period of the delay which may be much less than a full year) on the accretion sector payor but may result in a substantial tax reduction for the CFIT sector recipient. The temporary rate increase in the CFIT sector makes this strategy temporarily more attractive. *Cf. supra* note 41 (rate gap critical to tax avoidance via payment timing under a comprehensive CFIT).

46. *See supra* text accompanying note 32.

47. Certain risks may be diversified away by everyone and therefore are not aggregate risks. For example, suppose that a certain kind of accident afflicts a specified percentage, p, of the population each year, that each accident causes damage of $\$X$, and that the iden-

capital market this premium will be minimized as the risk is passed to individuals who are most willing to bear it and therefore will do so for the lowest price. Furthermore, individuals and firms will be able to "undo" the effects of taxation of the risky components of securities by adjusting their portfolios if the government accommodates these adjustments by shifting its own portfolio.[48] The government can accomplish this accommodation without affecting the risk-adjusted level of tax revenues. If pri-

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tity of the afflicted party is entirely random. Insurance companies can pool these risks together, collecting a annual premium from each person equal to the expected damage $pX (plus a fee that is very small compared to $pX to induce the companies to provide the risk pooling services) and then fully compensate all parties who are damaged. Each individual will lose exactly $pX (plus a negligible administrative fee) and face no risk in terms of economic outcomes. The insurance companies also will face no risk since they can average over large numbers of people. Their total payout will be the average amount of damage multiplied by the number of insured clients, an amount that is *known in advance*.

A global recession is different. It is like an accident that may or may not happen *to everyone simultaneously*—an *aggregate* risk. Capital markets pool this risk much like the insurance company in the accident hypothetical just presented. But, pooling this risk does not eliminate it. The insuring "group" (some collection of capital market participants) collects "premiums" to bear the risk, but the outcome for that group depends on whether the recession actually occurs. Aggregate risk may be shifted from one party to another, but *someone* must bear the risk. As a result, aggregate risk is "priced" in the sense that those individuals who wish to shed the risk will have to pay a premium (more than a negligible administrative fee) to the individuals who take on the risk without protection.

At first glance, it might seem possible to diversify away the risks of a recession across time. The idea is similar to the accident hypothetical: In any given year there is a probability p of a recession that causes X of lost output. In the face of such a recession, the government can borrow to cover $(1-p)$ times the loss. In years when there is no recession, the government can raise taxes by pX, using the proceeds to pay down debt accumulated from earlier recessionary years or to build up a fund for future recession relief. Private sector income falls by pX each year regardless of whether or not there is a recession. The government faces no risk since years with and without recessions will average out over time, resulting in a balanced "recession insurance" budget.

This approach will not work if the loss of output from shocks is "persistent" or "permanent" in the sense that output is lower in all future periods. In some simple macroeconomic models, such losses are not persistent or permanent. The economy fluctuates around a deterministic output trend. After the recession is over, output returns in future years to the same level that would have occurred in each future year absent any recession.

The problem is that economic growth tends to build at least in part upon earlier growth. For instance, "learning by doing" may be a significant component of such growth. As firms and individuals engage in production, they learn how to do it more efficiently. If there is a recession and no doing, there is no learning during that period of time, and the learning cannot be done "double time" in the next period. As a result, output falls in all future periods. A mountain climbing analogy is apt. You can only climb so far in a given day. If you take a day off and then resume your climb, you will be lower (by one day's climb) on all future days. Various empirical studies find some degree of persistence, but the available time series are not long enough for definitive results. *See* ROMER, *supra* note 2, at 175-80. To the extent that output loss is persistent or permanent, diversification of the risk of recession across time is not possible.

48. An accretion tax would lower the excess return when an asset appreciated more than the riskless rate of return. Individuals or firms could avoid any such effect on the excess return in advance by borrowing to buy more of the asset. If the government sold the asset short and did lending transactions in offsetting amounts, there would be no impact on market prices. Risk (including downside risk) would reside with the individuals and firms as if there were no tax. Risk-adjusted government tax revenues would be unchanged. *See* Louis Kaplow, *Taxation and Risk Taking: A General Equilibrium Perspective*, 4 NAT'L TAX J. 789, 792-93 (1994).

vate parties adjust their portfolios accordingly, the ultimate risk-bearing parties will be the same whether or not there is an accretion tax.

This scenario where the accretion tax is not a useful policy tool rests on two key assumptions. The requisite securities must be available in capital markets, and individuals must deliberately and rationally choose their portfolios. In the case of aggregate risk, the availability of the securities is plausible. Worldwide recession would have a predictable impact on equity and bond indexes that are surrounded by deep futures and options markets. Even an amateur investor could use these derivatives to insure in a rough fashion.[49] The deliberation and rationality assumption is less plausible. Even highly sophisticated individuals may not spend much time planning their portfolios. If certain individuals who have significant security and other wealth holdings that are not tax sheltered are under-insured because they have failed to plan carefully, the government might include them in the accretion tax regime so that the taxation scheme would provide some level of insurance. To the extent the government was in error concerning these individuals (i.e., the individuals intended not to be completely insured), the individuals could (at some cost) "undo" the government insurance scheme.

The case of "isolated" fluctuations is more interesting. Fluctuations in output and employment may originate in particular sectors. Some sectors, such as mining, construction, and agriculture, appear to be fairly isolated in that shocks in these sectors do not readily spill over to affect other sectors.[50] Shocks are promulgated from sector to sector because the output from some sectors are inputs for others. Shocks in sectors that produce goods that are only minor inputs in other sectors will not impact those other sectors very much. Thus, there could be a "recession" in one of these sectors that is not reflected in the national or world economy. For some of these sectors, there are readily available securities for insurance purposes. For instance, in the United States it is easy even for farmers who are not sophisticated traders to hedge using crop price futures markets. Other sectors such as construction present difficulties. This industry is regional and much of it is privately held. It may be difficult even for sophisticated parties to construct appropriate hedging portfolios. Subjecting such sectors to accretion taxation may provide valuable insurance services.

An interesting point that emerges from this discussion is that the accretion tax may be most useful in the situations where it is hardest to implement. When the market value of a business is evident because it is publicly traded, it is both easy to hedge and easy to implement an accretion tax. Where public markets are absent it will be difficult to hedge,

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49. It would be possible to insure more precisely using factor analytic techniques to construct "single factor" portfolios that are highly correlated with world or individual country GDP or some other desired indicator.

50. *See* John B. Long, Jr. & Charles I. Plosser, *Real Business Cycles*, 91 J. POL. ECON. 39, 59-60 (1983).

and it will be hard to implement an accretion tax because of the need for periodic valuationin the absence of market prices.[51]

"Isolated" fluctuations may be of particular concern when worker skills and physical capital are specific to a particular sector. In that case, capital and labor cannot easily flow out of the sector and earn returns elsewhere on a temporary basis if there is a downturn that is isolated to that sector. The factors employed in the sector will suffer from any sectoral slump without much ability to mitigate the losses. In the absence of deep and accessible insurance markets, including these sectors in the accretion tax column might be particularly desirable.

The mirror image arguments apply for imposing a cash flow tax on certain sectors. Sectors where losses are readily insurable, where parties are sophisticated enough to secure the insurance, and where factors can easily shift out and be temporarily employed elsewhere are particularly desirable targets for the powerful fiscal tools inherent in the cash flow income tax. Letting these sectors bear the brunt of any adjustments will minimize the adjustment costs of temporary reductions in employment and capital usage and will minimize the welfare costs of inefficient risk-bearing.[52] In addition, these sectors will not suffer as much from the absence of the automatic insurance or stabilization inherent in the accretion tax. In fact, it is likely that an accretion tax would be an ineffective device in these sectors because individuals and firms would "undo" its risk sharing properties in advance to the extent desired.

The possibility that a hybrid tax regime might be useful for macroeconomic purposes stands in contrast to the usual tax theory and economic view that hybrid schemes are, at best, political conveniences that create unnecessary economic and legal costs.[53] The economic costs come about because mixing income-based and consumption-based taxes

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51. One of the best approaches to address the valuation problem is Alan Auerbach's retrospective capital gains tax scheme. The scheme replicates the ex ante impact of an accretion tax in a regime where capital gains taxation occurs only upon disposition of an asset. In particular, assets are taxed as if they grew at the riskless rate of interest to the value realized at disposition. *See* Alan J. Auerbach, *Retrospective Capital Gains Taxation*, 81 AM. ECON. REV. 167, 172 (1991).

This scheme will not have the strong stabilizing impact of an accretion tax. First, there are no period-by-period rebates or taxes. These rebates and taxes (as opposed to unrealized future tax consequences) are crucial under Keynesian theories that emphasize shortfalls in aggregate demand arising from nominal rigidities. Second, the Auerbach scheme removes much of the responsiveness of tax liabilities to macroeconomic outcomes. Indeed, even after a very severe recession and large losses in securities markets, sale of any asset will result in a tax *liability* rather than a deduction or allowance for losses incurred.

52. There is one complexity that is worth mentioning. Sectors in the economy are linked because the outputs of some sectors are inputs for other sectors, and the best alternative employment of factors idled in one sector may be in only one or two particular other sectors. In short, adjustments imposed on one sector will "overflow" disproportionately to certain other sectors. In choosing which sectors should bear the brunt of any adjustment, it is important to consider the interactions between sectors.

53. This conventional viewpoint is not universal. *See* Edward J. McCaffery, *Tax Policy Under a Hybrid Income-Consumption Tax*, 70 TEX. L. REV. 1145 (1992).

results in intersectoral capital distortions.[54] Too much capital flows into the sectors subject to consumption-based treatment relative to the sectors subject to an accretion tax. The legal costs involve the need for the government to define and defend the borderline between the two different tax regimes.[55]

At present, the U.S. tax system is a hybrid. The federal personal tax has some elements that resemble an accretion tax, other elements that resemble a realization-based tax, and yet other elements that resemble a cash flow income tax. In addition, there is a payroll tax with a cap on the annual income base and an earned income tax credit applicable to lower-income households. These provisions primarily impact low-income and middle-income taxpayers. Because these groups are believed to have a higher marginal propensity to consume than high-income households, automatic stabilizers or explicit policies aimed at these groups may have a much stronger stimulative impact.[56] Along the same lines, the stabilization properties of the mark-to-market component of the accretion tax will depend on the marginal propensity to consume demonstrated by the group subject to that tax. Any scheme that groups different people into different tax sectors must reckon with the potential impact of different marginal propensities to consume.

III. QUALIFICATIONS AND GOALS FOR FUTURE RESEARCH

Part II studied the macroeconomic consequences of tax base choice by relying on a fairly simple Keynesian framework combined with some speculations about what would happen in a basic neoclassical model. Although this simplified analytic framework is useful for a first-cut conceptual approach to the subject, some results may not hold up to deeper scrutiny. This Part summarizes the results, discusses some obvious shortcomings in the underlying analysis, and briefly outlines some goals for future research.

A. A SUMMARY OF THE RESULTS

Part II examined three pure tax bases: the accretion tax, a realization-based tax, and the cash flow income tax. One focus of that Part was on the mark-to-market feature of the accretion tax. This feature has two important consequences: The current value of wealth holdings is insulated against any impact from changes in tax rates, and any asset value fluctuations are offset by the tax increases or reductions that follow from

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54. *See, e.g.*, Don Fullerton et al., *Replacing the U.S. Income Tax with a Progressive Consumption Tax*, 20 J. PUB. ECON. 3 (1983).

55. For instance, if "farming" is accorded cash flow treatment and "manufacturing" receives accretion treatment, taxpayers will prefer to have some of their activities classified as "farming" as opposed to "manufacturing." Classification may not be easy. For example, is canning fresh food part of the farming process or is it manufacturing?

56. *See* Auerbach & Feenberg, *supra* note 19, at 38-39, 45-47.

mark-to-market treatment. Insulating wealth against tax rate changes means that fiscal policy (in the form of rate adjustments) will depend solely on substitution effects. Both the accretion tax and the realization-based tax lower the after-tax rate of return (relative to the cash flow tax or no tax). This reduction will tend to lower the saving rate and increase the marginal propensity to consume with a consequent increase in the power of monetary policy and fiscal policy in a short-run Keynesian framework. On the other hand, the tax increases and reductions under the mark-to-market feature of the accretion tax will tend to offset any application of fiscal or monetary policy. This offset will be absent under a realization-based tax.

Changing tax rates under the realization-based tax involves a wealth effect. In particular, tax rate increases cause an *increase* in the present value of wealth holdings. This increase will tend to increase current consumption and leisure and to reduce output in a neoclassical setting.

The cash flow income tax differs sharply from the other two taxes in its macroeconomic implications. This tax makes fiscal policy potentially very potent. In particular, temporary tax increases or reductions will have a powerful impact on aggregate demand. However, the effectiveness of these increases or reductions will depend on whether the government is able to make the temporary nature of the tax changes credible.

Even in the absence of the credible application of temporary tax rate changes, fiscal and monetary policy under a cash flow income tax will have a non-trivial impact on the present value of wealth holdings. A permanent increase in cash flow income tax rates is equivalent to expropriation without compensation of a portion of all private wealth holdings. Monetary tightening that raises interest rates will have an unshielded negative impact on the value of private wealth holdings. Under neoclassical models, these wealth impacts will have significant short-run and medium-run macroeconomic effects. On the other hand, in a Keynesian framework, the higher savings rate under a cash flow income tax will diminish the effectiveness of fiscal and monetary policy.

A hybrid system with different tax treatments applied to different industrial sectors or to different groups of people allows the government to choose which sectors or groups to burden with the risk of macroeconomic shocks or the adjustment costs of government policy. Constructing an effective hybrid approach may be difficult because the (potentially very complex) interactions between sectors and groups are important.

B. DEEPENING AND EXTENDING THE ANALYSIS

The analysis in Part II suffers from major deficiencies. One problem is that the various macroeconomic tendencies identified for each tax base are not comparable. The discussion does not indicate, for instance, whether the policy-inhibiting nature of the mark-to-mark feature of the accretion tax is larger or smaller than the policy-enhancing effects of the lower savings rate that is a by-product of that tax.

The lack of comparability comes from several sources: The discussion patches together effects that arise in distinct models based on different behavioral, empirical, and systemic assumptions. It is worth focusing on the issues surrounding the mark-to-market feature to illustrate this problem. In Part II, the IS-LM diagram illustrating the impact of the mark-to-market features shows an IS curve shift that completely offsets the output-enhancing effects of tighter monetary policy (the LM curve shift).[57] However, it is by no means clear whether the offset would be complete. The degree of offset depends on the slopes of the IS and LM curves, but it also depends on assumptions about behavior that dictate how much each curve shifts. In addition, it is by no means clear whether the IS-LM model with its implicit dependence on nominal rigidities is an appropriate framework.

Thinking in neoclassical terms, this situation involves a change in wealth that is mitigated by a tax rebate. If the tax rate is 40% and the monetary tightening causes an individual's wealth to fall by $10,000, then there will be a tax rebate of $4,000. The net effect is to reduce the drop in wealth from $10,000 to $6,000. In traditional neoclassical models, individuals are assumed to maximize expected utility in an intertemporal framework. The typical response to a drop in wealth would be to reduce current consumption and leisure. A concomitant increase in interest rates would induce a substitution effect that would increase saving. The mark-to-market aspect of the accretion tax would reduce the magnitude of these effects because it would reduce the drop in wealth that triggers the changes. But, the impact of the effects would flow in the same direction.

It may be the case, however, that an individual would respond more strongly to the $4,000 cash rebate than to the $10,000 drop in the value of the individual's wealth holdings. This differential response may be rational. If the individual is liquidity constrained but rational,[58] receiving the cash releases the constraint and might induce the individual to increase current consumption and leisure, the opposite effect from the situation with no liquidity constraints.

It is worth noting that liquidity constraints may not be the whole story. Individuals may spend more easily out of cash receipts because they are not fully rational or deliberate. A recent study by Nicholas Souleles of consumption behavior associated with tax refunds suggests that both a rational response to liquidity constraints and other phenomena that do

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57. *See supra* text accompanying note 28 (IS-LM Diagram IV).

58. "Liquidity constrained" means that capital market imperfections make the individual unable to borrow against future income or make such borrowing costly. Unconstrained intertemporal optimization might call for higher consumption and leisure in the present, but the liquidity constraint prevents the individual from optimizing. When the constraint is relaxed by an unexpected cash receipt, it may be rational for the individual to consume that receipt even if it is accompanied by a drop in wealth.

not easily fit in a rational-maximizing framework are at work.[59] This study finds total short-run consumption from tax refunds to be in the 35% to 60% range, a surprisingly high proportion.

An additional complication involves the differential impact of tax payments or rebates on parties that differ in wealth or income. Assuming all individuals are rational, persons high in the wealth or income distribution are less likely to be liquidity constrained and are more likely to have a very low marginal propensity to consume out of tax rebates or tax levies. This propensity may be on the order of the 1% to 5% range estimated for current consumption out of stock market gains,[60] a much lower figure than the 35% to 60% range found in the Souleles study for tax refunds. Many forms of wealth are held disproportionately by people at the top of the wealth distribution, but the pattern varies substantially by type of asset. For example, in 1998 for the United States, the top 20% of wealth-holders held 95.9% of all common stock (including 98.3% of all such common stock held outside of pensions and other tax-favored vehicles) but "only" 70.7% of all housing equity.[61] The automatic stabilization properties arising from marking assets to market will be much less salient if their primary impact is on individuals with low marginal propensity to consume.[62]

When all these additional factors are added to the picture, the final outcome becomes very unclear. Consider the case discussed above of monetary restraint under an accretion tax regime: The Fed contracts the money supply by selling government securities in open market operations. Interest rates increase, asset values fall, and individuals receive tax rebates in cash as these assets are marked (down) to market. If individuals are completely rational and not liquidity constrained, they will treat the tax rebates as reducing but not eliminating the drop in wealth and respond accordingly—reducing consumption and leisure. Output will increase. However, if individuals consume the cash rebates because they are liquidity constrained or because they (irrationally) treat cash receipts and payments differently from unrealized wealth changes, then the result may be very different. Consumption and leisure may increase, causing output to drop. The actual outcome depends on two factors. First, the distribution of wealth is important since this distribution determines the proportion of the population that is liquidity constrained. Second, it matters whether a significant number of people who are not liquidity constrained have an irrationally high propensity to consume out of available cash.

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59. Nicholas S. Souleles, *The Response of Household Consumption to Income Tax Refunds*, 89 Am. Econ. Rev. 947, 956 (1999). *See also*, Auerbach & Feenberg, *supra* note 19, at 45 (discussing the literature).

60. *See* James M. Poterba, *Stock Market Wealth and Consumption*, 1 J. Econ. Persp. 99, 107 (2000).

61. *See id.* at 102 (Table 2).

62. For a very good discussion of the impact of differential marginal propensities to consume on automatic stabilization under current U.S. tax law, see Auerbach & Feenberg, *supra* note 19.

It is clear that addressing the issues raised in Part II requires more explicit and sophisticated modeling that will make the contingent nature of the results more apparent and that will allow incorporation of more institutional and structural elements into the analysis.[63]

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63. Another important extension is to embed the interaction of a nation's tax base and macroeconomic policy in an international setting. Adding international elements to the picture can greatly affect the nature of that interaction. *See, e.g.*, MAURICE OBSTFELD & KENNETH ROGOFF, FOUNDATIONS OF INTERNATIONAL MACROECONOMICS (1996).