1 Introduction

Time consistency has become an integral part of explanations of many economic phenomena, in large part because of insights it gives into these phenomena. For example, it helps us to formalize and hence better understand a welfare-maximizing government’s incentive to promise that accumulated capital will not be taxed and then to use a capital levy in the face of severe revenue shortfalls. The government’s incentive toward time-inconsistent behavior in this case also helps explain why capital accumulation may be so low in countries with weak safeguards against such behavior.

1.1 Defining Time Inconsistency

Let’s begin with a definition of time inconsistency. Suppose that a policymaker is responsible for choosing a policy starting at time $t$ for several periods into the future. Consider his choice of the tax rate for time $t + s$, where we denote by $\tau_{t+s}(t+j)$ the policy chosen at time $t+j$ for $t+s$, $0 \leq j \leq s$.

A forward-looking policymaker can obviously wait until $t+s$ to choose the tax rate for that date, or can choose the $t+s$ tax rate at $t$ (where, in a world with uncertainty, he could choose a vector of state-contingent tax rates, one for each state of nature). If there are no changes in his preferences or in technology, nor any unanticipated shocks between $t$ and $t+s$, one would think from basic dynamic programming that it would not matter whether the tax rate for time $t+s$ is chosen at $t+s$ or at $t$: the value should be the same. In fact, this observation was used to derive the value function. Time inconsistency is said to arise if, though nothing has changed (at least ostensibly), these choices are not equal\(^2\), that is, if:

$$\tau_{t+s}(t+s) \neq \tau_{t+s}(t) \quad (1)$$

A natural reaction is, “So, what else is new?” Don’t we see politicians quite often announcing that they will carry out a specific policy in the future, but then doing something else when the time comes? They are trading a promise of future action against a tangible benefit (such as electoral

\(^1\)Sections 1-3 of these notes are based on chapter 4 of Drazen (2000).

\(^2\)The term “time inconsistency” was introduced into economics by Strotz (1956), though the reason for time inconsistency in his model is quite different from the reason here. He considers an individual with a utility function which does not change over time, but where discounting of future utility is not exponential. To take a discrete-time example, suppose individuals treat the current period differently than future periods, in that $W(\alpha, \alpha_{t+1}, ...) = u(\alpha) + \alpha(u(\alpha_{t+1}) + \beta^2 u(\alpha_{t+2}) + ...)$, where $\beta$ is the standard discount factor and $\alpha < 1$. Because of the nature of discounting, $\alpha_{t+1}$ chosen at $t+1$ will differ from $\alpha_{t+1}$ chosen at $t$. 

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support) today, but not fulfilling their part of the deal. More generally, anyone who makes an agreement to receive something today against the promise of repaying tomorrow would be tempted to renege and not repay, if such an action would increase his utility.

If time inconsistency meant simply reneging on a promise or agreement when an individual finds it optimal to do so, one would still ask how such behavior can be prevented, but the phenomenon itself would not occupy us for very long. What makes the phenomenon interesting is that it occurs in cases where time-inconsistent policy is chosen to maximize the welfare of those who are misled. Put simply, the policymaker has the incentive to mislead people for their own good! Furthermore, as noted above, the fundamental characteristics of the policymaking environment appear not to have changed. If the environment has changed (for example, due to an exogenous shock to the economy), a change in the optimal policy would not be surprising. With no ostensible change in the fundamental environment, the result in (1) appears puzzling.

1.2 The Examination Problem

We begin with a simple example, leaving for later an analysis of what lies behind the time consistency problem. This example, a favorite of academics, concerns final examinations. As all students know, professors are interested solely in their students's learning, and give examinations only to induce students to study more. At the beginning of the term it is thus optimal to announce that there will be a final exam. Otherwise students will not study hard enough given the demands on their time at the end of the semester. In anticipation of an exam, students will study and hence learn more. On exam day, when the students arrive to the exam having learned the material, everyone is better off if the professor cancels the exam (and simply gives each student a satisfactory grade): students are spared the anxiety associated with finding out about grades and can use the exam time for something else; the professor is spared the trouble of grading the exam. Hence, if the professor’s original announcement was believed and students studied, time-inconsistent behavior in canceling the exam is optimal.

2 A Simple Model of Capital Taxation

We use the capital taxation model from the pathbreaking paper of Kydland and Prescott (1977) of capital taxation in a two period, *representative agent* model. The presentation follows Fischer (1980). The representative agent treats government spending as a *parameter* in his decision problem. We
will later contrast this with a *single* agent, who thus internalizes the government’s budget constraint.

### 2.1 Set-up and First-Best Solution

Individuals consume in both periods, but production and government activity occurs only in the second period. In the first period, a representative individual receives an income endowment $y$ which he divides between consumption $c_2$ and accumulation of capital $k$ to be used in the second period. Labor $n$ is also supplied in the second period and the production function is linear in $k$ and $n$, so that product market equilibrium in the two periods is:

\[
\begin{align*}
  c_1 + k &= y \\
  c_2 + g &= an + Rk
\end{align*}
\]

where $g$ is government spending. The utility of the representative individual over the two periods as of $t = 1$ is given by a utility function $u(c_1, c_2, 1 - n, g)$, which can be specialized to:

\[
U_1 = \ln c_1 + \beta [\ln c_2 + \varphi \ln(1 - n) + \gamma \ln g]
\]  

(2)

where $\beta$, $\gamma$, and are given parameters.

The “benevolent” government’s objective is maximize the welfare of the representative individual. The first-best allocation, derived by maximizing the utility function over quantities, is:

\[
\begin{align*}
  c_1 &= \frac{y + a/R}{1 + \beta(1 + \delta + \gamma)} \\
  c_2 &= \beta Rc_1 \\
  n &= 1 - \frac{\delta}{a}\beta Rc_1 \\
  g &= \gamma \beta Rc_1
\end{align*}
\]

which implies that

\[
  k = \frac{\beta (1 + \delta + \gamma) y - a/R}{1 + \beta (1 + \delta + \gamma)}
\]

This is the first-best solution, what Fischer calls the *command optimum*, since with the instruments it has available to it, the government can basically ”command” the optimum allocation. To
put the same point less dramatically, the command optimum would be achieved if the government had available sufficient non-distortionary fiscal policy tools so that they could hit whatever quantity allocation they desired. In this example, a single lump-sum tax, levied in either period, would be sufficient to achieve the command optimum.

2.2 Distortionary Taxation

Suppose, however, that the government does not have access to non-distortionary means of financing its expenditures $g$ and must use distortionary taxes in the second period, $\tau$ on capital and $\mu$ on labor. The individual’s problem is to choose consumption, saving, and labor supply for given tax rates to maximize his lifetime utility subject to his budget constraints:

$$
\begin{align*}
c_1 &= y - k \\
c_2 &= (1 - \tau)Rk + (1 - \mu)an
\end{align*}
$$

(4)

The individual also takes government spending $g$ as given, a crucial assumption. The fact that the individual does not internalize the government’s budget constraint reflects the fact that a representative agent is atomistic, that is, he assumes his actions have no effect on economy-wide aggregates, even though all individuals are identical and make identical choices. This is the standard assumption in economics, which, if well understood, causes no problems. Making a clear distinction between a representative (atomistic) agent and a single (non-atomistic) agent who can affect economic aggregates is crucial for an understanding of the time consistency problem as well.

Individual maximization yields demand and supply functions $c_1(\tau^e, \mu^e), k(\tau^e, \mu^e), c_2(\tau, \mu),$ and $n(\tau, \mu),$ where $\tau^e$ and $\mu^e$ are expected tax rates (as of period 1) on capital and labor in period 2. Given the individual’s decision, the government chooses actual tax rates $\tau$ and $\mu$ in the second period to maximize individual welfare, subject to the government budget constraint:

$$
g = \tau Rk + \mu an = \tau Rk (\tau^e, \mu^e) + \mu an (\tau, \mu)
$$

(5)

The key question is then how expectations of tax rates are formed, and specifically, whether the vector $(\tau, \mu)$ that the government chooses will equal the vector the government would like the public to expect. If not, there is an inherent time consistency problem, as defined in equation (1). To check whether time consistency exists, suppose for a moment that individuals fully believed whatever announcement $(\tau^a, \mu^a)$ the government makes, that is, $(\tau^e, \mu^e) = (\tau^a, \mu^a)$. We can then
think of the government as having four tax instruments, namely $\tau^a, \mu^a, \tau$, and $\mu$. The question of time inconsistency is whether or not $\tau = \tau^a$ and $\mu^a = \mu$? (In terms of the notation in (1), is $\tau_2(2) = \tau_2(1)$ and is $\mu_2(2) = \mu_2(1)$?)

2.3 Time Inconsistency

There is good reason to expect time inconsistency in capital taxation. As of period two, with capital $k$ in place, the government has the incentive to minimize distortions by taxing only capital and leaving labor untaxed. Hence a government interested in maximizing welfare has the incentive to be time-inconsistent, announcing a low level of labor taxation \textit{ex-ante} and, if that announcement is believed and capital is accumulated, taxing it heavily \textit{ex-post}, that is by announcing a surprise capital levy. This decision reflects a basic optimal tax result that factors whose supply is inelastic should be taxed more heavily. \textit{Ex post}, capital is an inelasically supplied factor. More generally, time inconsistency will characterize factor taxation whenever the \textit{ex-post} elasticity of factor supply is less than the \textit{ex-ante} elasticity.

The formal test for time inconsistency in this model would be as follows. Using (2) and the supply and demand functions $c_1 (\tau^a, \mu^a), c_2 (\tau, \mu)$, and $n (\tau, \mu)$ derived from individual maximization, we have an indirect utility function $V (\tau^a, \mu^a, \tau, \mu)$ as of the first period. In the first period, the government would maximize $V (\tau^a, \mu^a, \tau, \mu)$ over $\tau^a, \mu^a, \tau, \mu$ treated as separate choice variables. In the first period, the government will announce the tax vector $(\tau^a, \mu^a)$, where the argument in the previous paragraph implies that it will be optimal to announce a low tax rate to encourage capital accumulation. In the second period, given the capital stock $k$, the government will carry out $(\tau, \mu)$. If $\tau \neq \tau^a$ and $\mu \neq \mu^a$, there is time inconsistency on the part of a benevolent government. In general, this will be the case, due to $k$ being inelasically supplied as of period two.

The solution that results can be called the \textit{time-inconsistent solution}; in fact there are many time-inconsistent solutions, one for each value of the second-period tax rate which was expected. We do not call this a time-inconsistent equilibrium, since it will not be an equilibrium with rational, forward-looking individuals.

2.4 Precommitment

Suppose that the government could \textit{commit} itself to whatever policy it announced in the first period, so that $\tau = \tau^a (= \tau^c)$ by virtue of the existence of a mechanism that allows commitment. The government chooses $\tau$ to maximize representative agent utility (2), knowing the functional relation
\( k (\tau, \mu) \). They announce \((\tau, \mu)\) and have a mechanism to commit to it and not to re-optimize in the second period. The resultant solution is called the *precommitment* solution.\(^3\) In most models, this solution is unique.

### 2.5 The Time Consistent Solution

The lack of a mechanism for the government to precommit in period one to a period-two fiscal policy does not however mean that the equilibrium solution will exhibit time inconsistency. As indicated above, if the public is sophisticated, it realizes that given capital in place in the second period the government will have the incentive to tax capital heavily in the second period, that is to re-optimize and choose \(\tau > \tau^a\) if individuals believed the announcement \(\tau^a\). Hence, to choose their optimal saving, individuals would form their expectations \((\tau^e, \mu^e)\) not on the basis of any policy announcement \((\tau^a, \mu^a)\), but according to the government’s known incentive to re-optimize. That is, they will the use \((\tau, \mu)\) as calculated in the next-to-last paragraph as their expectation \((\tau^e, \mu^e)\) in their behavioral functions \(c_1(\tau^e, \mu^e), k(\tau^e, \mu^e)\), where rational expectations requires that \((\tau, \mu) = (\tau^e, \mu^e)\). (That is, we consider the calculation of the next-to-last paragraph and look for a “fixed point” in tax rates.)\(^4\)

The solution is *time-consistent*: when the second period arrives their expectations about the tax rate the government chooses are fulfilled. This solution is also referred to as the *dynamic programming* solution, since forward-looking agents realize the government is solving a dynamic programming problem and use this fact in forming their expectations. That is, in choosing desired capital accumulation, the public takes account of the government’s behavior relating \(\tau\) to capital in place \(k\).

### 2.6 Utility Ranking

We can rank these four solutions in terms of the individual’s welfare, temporarily setting aside the question of whether they are all feasible equilibria. Utility can be no higher than at the first-best allocation, that is, at the “command optimum”. Utility is next highest for the time-inconsistent solution. (As noted above there are many such solutions, one for each expected tax rate.) To see why this (weakly) dominates the precommitment and the time-consistent solutions, note that in both of the latter cases, \(\tau\) is correctly anticipated. Hence, if it were possible to fool the public, utility

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\(^3\)These solutions may be characterized in terms of “who moves first”. In the precommitment solution, the government fixes tax rates, after which the public chooses \(k\). In a time-inconsistent solution, the public chooses \(k\), after which the government chooses tax rates.

\(^4\)This solution may be visualized in terms of reaction functions. The government’s choice of tax rates depends on \(k\); the representative individual’s choice of \(k\) depends on (correctly anticipated) tax rates; the intersection of these two reaction functions is the time consistent solution. One sees that the time-consistent equilibrium is a Nash equilibrium.
could certainly be no lower, and would in general be higher. For example, call the precommitment solution \( \tau^P \). The government would announce \( \tau^P \) in period one and (if it’s possible to be time inconsistent) chose whatever capital tax rate was optimal in period two. Finally, individual utility in the precommitment solution is no lower (and generally higher) than in the time-consistent solution, since the government could always commit to the time consistent tax rate. It is the impossibility of precommitment in many environments which implies that the (lower-welfare) time-consistent capital tax rate is the only feasible constant tax rate.

3 Explaining Time Inconsistency

In both of the examples of possible time inconsistency, it is not really true that nothing has changed between period one and period two. A key state variable (human capital in the examination example, physical capital in the capital taxation example) has changed, though in a predictable way. The lack of a lump-sum tax to finance government expenditures, combined with the accumulation of capital makes it optimal for the policymaker to choose a different setting of the policy variable.

What is important is not simply this change per se, but in the reason for the change: expectations of future government policy influence individuals’s current investment choices. Government thus has the incentive to lead people to expect one sort of policy, but once individuals act on this expectation to do something else. Why doesn’t the government try to influence capital accumulation more directly? If the government had sufficient instruments (as indicated above, access to lump-sum taxation in the second example), they would not need to manipulate expectations to induce investment. The optimality of trying to fool people to “invest for their own good” reflects, among other things, insufficient policy instruments.

Though “insufficient instruments” or “lower ex-post than ex-ante elasticity” are often given as reasons for time-inconsistency, and indeed are central to the capital tax example, they really don’t explain time inconsistency. Why do people “need to be fooled”? Why can’t they operate for their own good? The short answer is not that they are irrational, but that they are acting rationally subject to pre-existing constraints or distortions.

Focusing on constraints as the essence of the time consistency problem is a frequent approach to understanding the problem. For example, Persson and Tabellini (1994) stress “the additional constraints that reflect the specific nature of the policy-making process” (p. 2), which they term “incentive constraints.” In the case of time consistency, these incentive constraints “emanate from the sequential nature of policy-making, particularly from the possibility to deviate from earlier plans.
or announced policy rules”. They are correct in stressing the sequential nature of policymaking as a necessary condition for the possibility of time inconsistency. However, this focus leaves unanswered the question of whether an incentive to deviate from previous plans exists whenever policymaking is sequential, or, instead, whether time inconsistency reflects a more basic aspect of the policymaking process.

No problem of time inconsistency would arise if once a policy were chosen it were immutable, but the sequential nature of policy choice can’t itself be the essence of the problem. Sequential policymaking is a necessary but not a sufficient condition for the possibility of time inconsistency to arise. Sequencing, with the possibility of revisiting a decision, is important for most of the decisions we make, but few of our choices exhibit time-consistency problems.

One may add that in our examples, time inconsistency arose from the attempt of one agent to influence the behavior of another agent. However, the combination of sequential behavior and the possibility of taking an action in order to manipulate someone else’s behavior is also not sufficient in itself to produce a time inconsistency problem. One must understand why one agent would have the incentive to fool the other. One could think of numerous examples where decisions are necessarily sequential and where changing one’s decision could affect someone else’s decision, but where time consistency is not an issue.

Hence, I argue, instead, that what is essential to the phenomenon of time inconsistency is conflict of interests which cannot be addressed with existing instruments without the attempt to fool. If the government and private sector are really maximizing the same function at each stage, then there will be no time consistency problem. We make this clear by considering the same problem as above, but with government and a single agent maximizing the same function.

4 Time Inconsistency as a Conflict of Interests

Time inconsistency is generally seen as a problem which can arise even with an infinitely-lived, benevolent social planner, benevolent in the sense that his objective is to maximize social welfare. While some early interpretations of the time consistency problem argued that it reflected a divergence of interests between the social planner and the representative individual, subsequent papers stressed that time inconsistency did not reflect the presence of a policymaker whose objective was to maximize something other than social welfare. Hence, the title of Fischer’s (1980) influential paper, “Dynamic Inconsistency, Cooperation and the Benevolent Dissembling Government.”

Put another way, the standard view is that for there to be an incentive for the government to
follow time inconsistent policies, there need be no conflict of interests among different individuals, or between individuals and the government. In these notes we question this view and argue that conflict of interests is central to time inconsistency in capital accumulation (as well as to other instances of time inconsistency).

4.1 A Single Agent Problem

To make this point clear, let us consider a version of the capital taxation problem, where instead of a representative agent, there is only a single individual facing the government. The crucial implication is that unlike the representative agent case, the individual takes into account the effect of his choices on government behavior. Among other things this means he internalizes the government’s budget constraint.

For simplicity, suppose that capital $k$ is the only factor. (Having labor $n$ as a second factor, as in section 2 would not change the basic result.) The individual chooses $k$ (which is his saving) and the government chooses the tax rate $\tau$. The individual and the government act sequentially, the agent who moves first will take the other agent’s reaction function into account. We represent this as a two period problem as in section 2. The individual’s budget constraints are

$$
c_1 = y_1 - k
$$
$$
c_2 = y_2 + (1 - \tau)Rk
$$

where $y_t$ is endowment in period $t$. The government budget constraint is

$$
g = \tau Rk
$$

The utility of the representative individual over the two periods as of $t = 1$ is given by a utility function $U(c_1, c_2, 1 - n, g) = u(c_1) + \beta u(c_2) + \beta v(g)$. Since the individual internalizes the government’s budget constraint, both government and individual are maximizing the same utility function which may be written

$$
U(\tau, k) = u(y_1 - k) + \beta u(y_2 + (1 - \tau)Rk) + \beta v(\tau Rk)
$$

We can then think of two sequences of actions: the individual chooses $k$, then the government chooses $\tau$; or the government first chooses $\tau$, after which the individual chooses $k$. It is simple to show that the sequence of moves has no effect on the outcome.
Suppose, for example, the individual first chooses \( k \), after which the government chooses \( \tau \), the case which gave rise to time inconsistency in the representative agent case. To solve, one works backwards, solving the second-stage problem first. This yields the government’s reaction function. The resultant first-order condition, \( \partial u / \partial \tau = 0 \), defines a reaction function \( \tau = T(k) \), which the individual takes account of in stage 1. (That is, this solution will be time consistent.) Formally, in stage 2 the government’s problem is

\[
\max_{\tau} U(\tau, k)
\]

for \( k \) given. One obtains

\[
-\beta Ru'(y_2 + (1 - \tau)Rk) + \beta Rkv'(\tau Rk) = 0
\]

which implicitly defines \( \tau = T(k) \).

In stage 1, the individual’s problem may be written

\[
\max_k U(T(k), k)
\]

One obtains a first-order condition

\[
-u'(y_1 - k) + \beta (1 - \tau) Ru'(\tau Rk) + \frac{dT(k)}{dk} (-\beta Ru'(y_2 + (1 - \tau)Rk) + \beta Rkv'(\tau Rk)) = 0
\]

Using (10), (12) becomes

\[
u'(c_1) = \beta Ru'(c_2)
\]

and (10) becomes

\[
u'(c_2) = v'(g)
\]

Note that these are identical to the first best “command optimum” given in (3).

When we consider the reverse sequencing, that is, when the government first chooses \( \tau \) after which the individual first chooses \( k \) (the precommitment case) in the representative agent problem, it is easy to show that the same optimal conditions will emerge. The timing doesn’t matter. In terms of our earlier terminology, the time-consistent solution (as just derived) and the precommitment solution (which would characterize the reverse timing) are the same. There is no problem of time inconsistency.

Note that if the individual chose both \( \tau \) and \( k \), we would get the same, first-best solution. This
point, though obvious, may be helpful in understanding the basic conflict of interests in the representative agent model below.

Why then is there a problem of time inconsistency in the capital tax example in the previous section? It reflects the distinction between a single and a representative agent. Let us now consider the same problem for a representative agent to make this point clear.

4.2 A Representative Agent Problem

In the representative agent version of this problem, individuals do not internalize the government budget constraint and thus take government spending $g$ as given in making their saving decision $k$. That is, he takes the aggregate of $k$ over all individuals (or the tax base) as given. Expressing this aggregate (in per capita terms) as $\bar{k}$ for simplicity of exposition, the representative agent takes $\tau R \bar{k}$ as given in the last term of (8) in his maximization problem. Of course in equilibrium, $\bar{k} = k$, but this notation may make the argument clearer.

In this case, the order of moves is crucial. Consider first the case in which individuals choose $k$, after which the government chooses $\tau$, the case which led to time inconsistency in the representative agent problem in section 2 (with two factors), but not in the single agent problem. In the second stage, the government maximizes (8) taking $\bar{k}$ as given, yielding the first order condition (14)

$$u'(y_2 + (1 - \tau)R\bar{k}) - u'(\tau R\bar{k}) = 0$$

(15)

In the first stage, the individual chooses $k$ to maximize (8), taking $g$ and $\tau$ as given, yielding

$$u'(y_1 - k) = \beta R (1 - \tau) u'(y_2 + (1 - \tau)Rk)$$

(16)

that is, evaluates the choice of $k$ using the after-tax (that is, including tax distortion) rate of return. Note that to increase capital accumulation, the government has an incentive to announce a low $\tau$ ex ante, but then choose $\tau$ ex post according to (14).

If we reverse the sequence of moves, the solution for $\tau$ is different. When the government moves first (the “precommitment solution”), it takes into account the effect of $\tau$ on $k$ and hence $\bar{k}$. In the second stage, the individual’s first-order condition for $\tau$ is (16). This yields a reaction function to $\tau$, which we may write $J(\tau)$. In the first stage, the government chooses $\tau$ to maximize (8) taking not $\bar{k}$ but the reaction function $J(\tau) (= k = \bar{k})$ as given. The resulting first-order condition may be written
(after minor manipulation)

\[ u' (y_2 + (1 - \tau)R\bar{k}) - v' (\tau R\bar{k}) = -\frac{\tau}{k} \frac{dk}{d\tau} \]  

(17)

The tax rate in (17) obviously differs from that in (15).

4.3 Time Inconsistency in the Representative Agent Problem

The dependence of utility on aggregate allocations thus induces a source of conflict among agents, which is crucial for the possibility of a time consistency problem. A representative agent takes the capital tax base \( \bar{k} \), and hence \( g \), as given in his maximization; each individual wants a high per capita tax base, so that \( g \) is high, but low taxes on himself. In contrast, a single agent would “internalize” the government’s budget constraint. In terms of objectives, the government takes account of individual’s demand functions, but the representative individual doesn’t take account of government’s “reaction function”. Hence, though the government’s objective is the same as the individual, the actual functions that they maximize are different.

To see this more formally, suppose that each individual could choose both the tax rate on himself and the tax rate on others. We can represent this in our set-up by assuming that the individual could choose independently both the \( \tau \) that he faces and \( g \). Though this sounds artificial, we noted that in the single agent problem, this would yield the same solution as his only choosing \( \tau \) and the government choosing \( k \). Here, when the individual sees no connection between \( \tau \) and \( g \), how would choose his own \( \tau = 0 \), but would want \( g \) as high as possible.

This conflict of interests, inherent in a representative agent set-up, is necessary, but not sufficient. To see this, suppose we had multiple agents, but non-distortionary taxation. We could achieve the first-best, and there would be no time consistency problem. This is what Fischer calls the “insufficient instrument” problem. However, the lack of first-best instruments also does not in itself imply a time consistency problem, unless time inconsistent behavior gives an “extra instrument”. In the capital tax problem, time inconsistent behavior gave an extra instrument not simply because of the difference in ex-ante and ex-post elasticities of substitution in supply of capital, but because the relation between ex-ante and ex-post elasticities of substitution differed across the taxed goods labor and capital.

REFERENCES


