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TIME INCONSISTENCY FOR THE
PRACTICAL UNDERGRADUATE

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Time Inconsistency For the Practical Undergraduate

by Michael Stutzer

Consider the following scenarios. Suppose the government announces that it will institute a permanent decrease in the tax rate on corporate income. The announced intent of this action is to encourage more capital investment, although this comes at the expense of lower tax revenues. After a large amount of new investment is stimulated, though, the government really intends to increase the corporate tax rate, in order to collect a "windfall" tax from the new investment. This action will cause howls of protest from those investors who were "fooled" into thinking that the rate decrease was permanent. Those potential investors who saw through the ruse at the outset and never invested will be in better shape than those that did not. Along the same lines, suppose the government announces that it will permanently balance the budget. The announced intent of this action is to lower inflationary expectations, which will in turn induce lender participation in the long-term capital markets. This comes at the expense of the borrowers, though, who will see the real value of their debts increased by lower inflation. After long-term credit is extended by lenders, the government really intends to start running deficits again, in order to aid the borrowers by reducing the real value of their debt. This action hurts lenders who believed the government's promise that the budget would remain balanced, and rewards potential lenders who understood the government's gambit and stayed out of the long-term capital markets. What do these two scenarios have in common?

In both scenarios, the government announces one plan for the future, while fully intending to implement a different plan. Because the plan announced is inconsistent with the plan implemented, the government

strategy is termed time inconsistent. Also, in both scenarios the success of the government's time inconsistent strategy depends on the public's fallacious belief that the announced plan will be implemented. For suppose that in each scenario the affected firms anticipated the government's true intentions. Then, no extra investments would be forthcoming, nor would there be greater lender participation in the long-term capital markets. The status quo would not have been improved. It will be argued below that the public will, in general, anticipate time inconsistent strategies of this ilk. Thus, the government must expect such strategies to fail, and must look to other planning strategies whose effectiveness doesn't depend on surprising the affected public.

There are two reasons why policymakers should expect that the affected public will anticipate time inconsistent strategies. First, it is in the affected public's interest to anticipate them. In both scenarios, agents that have the ability to anticipate the strategy are better off than those that do not. This confers a competitive advantage to agents with the ability to anticipate the strategy. Forces of competition--"the natural selection" of the market place--thus favor the survival of agents that have this ability. Over the long haul, these are the only agents that will survive, and consequently will be the ones the policymakers must deal with. But, do any agents actually have this ability to anticipate correctly? If not, this argument fails, for in this event no agents have a competitive advantage over their brethren. Then, government needn't worry about eventually facing only the ones which do anticipate correctly, since none of them will ever do so. The answer to this question is also the second reason why policymakers should expect the failure of this time inconsistent strategy, this being that, at least in some contexts, empirical evidence supports the notion that the public does anticipate time inconsistent strategies.

In our two scenarios, we have seen that the time inconsistent strategies did not work well when anticipated, which they are in fact likely to be. Perhaps this is not too bad if these are the only two scenarios in which time inconsistent strategies will not work well. Unfortunately, this is not the case. There are many other scenarios where time inconsistent strategies fail as well. For example, consider the following well-known problem of optimal patent provision. The government announces that it intends to grant long-term patents to inventors. The announced intent of this policy is to encourage more inventive activity, although this comes at the expense of permitting the inventors to monopolize the sale of their inventions. After a large number of desirable inventions are marketed, though, the government really intends to revoke the patents, in order to ensure that the inventions are sold in competitive markets. Once again, the success of this time inconsistent strategy depends on the inventors' failure to anticipate it. For if they did anticipate it, few, if any, inventions would be forthcoming from them.

Readers can amuse themselves by constructing other examples of time inconsistent strategies. The common structure of all these constructions is illustrated in Figure 1 below.

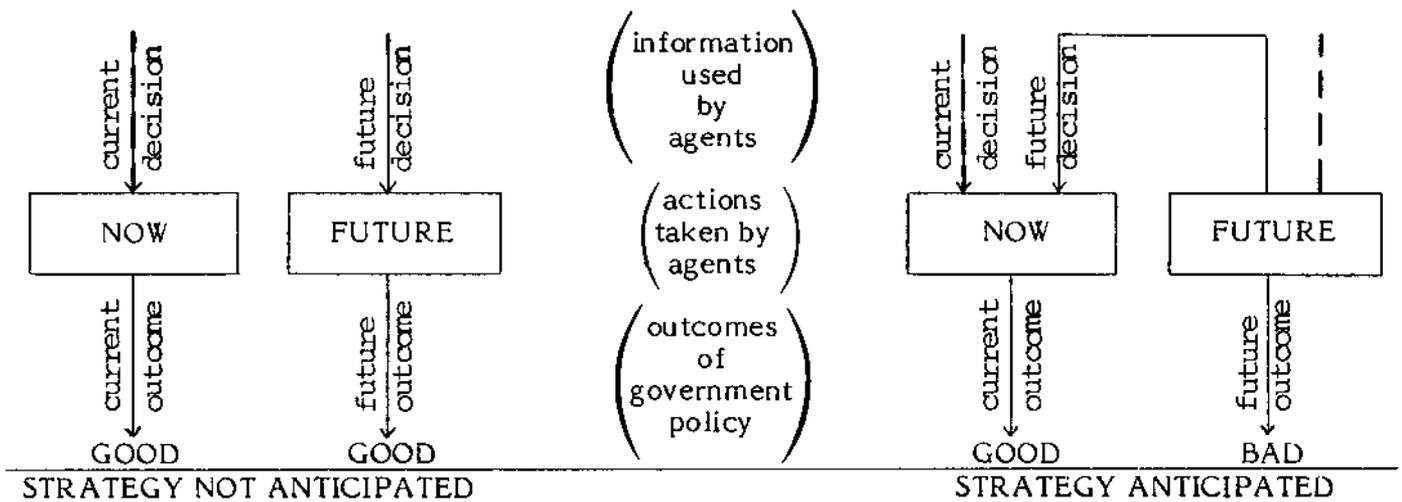


Figure 1

The left-hand side of this figure depicts the current and future outcomes if the government strategy is not anticipated, so that the announced plan, indicated in dashes, is believed. The actions taken by economic agents thus "fooled" are such that the government will find it desirable to implement a different plan, indicated in bold. This plan couples the current part of the announced plan (the intention to offer patents) with the future intention of changing it (revoking the patent). The government finds both the current and future outcomes of its unanticipated strategy desirable. The right-hand side of this figure depicts the current and future outcomes when the government strategy is anticipated. In this case, the actual plan implemented, indicated in bold, is the one believed. The announced plan, when coupled with information about the government policy objectives, just serves to cue the affected parties about the government's true intentions, which are what the affected parties base their actions on. The affected parties now take the actions which the government finds undesirable. By incorrectly expecting that the affected parties will believe the announced plan, the government is surprised to find that the affected parties act in the way they do. But how will the government interpret this surprise?

If the government continues to think that agents will believe the announced plan, they must incorrectly blame other reasons for the bad performance of their strategy. Acceptance of these incorrect reasons ensures the continuance of the undesirable strategy. For example, if the corporate taxation strategy fails to elicit more investment, the firms may be accused of lacking Keynes' "animal spirits," i.e., guts. Or, a variety of unexpected "random shocks," such as an unexpected increase in energy prices, might be blamed. Unfortunately, if such a reason is incorrectly accepted, the government may never consider the consequences of abandoning its time inconsistent strategy.

However, if the government is willing to consider other, more desirable, strategies, one alternative immediately suggests itself. That alternative is to implement the announced plan. A permanent decrease in the corporate tax rate may lower tax revenues, but capital formation will be stimulated. When anticipated, the time inconsistent strategy causes no loss in tax revenue, but also yields no capital formation. Presumably, in considering tax cuts, the government is willing to strike some trade-off between more capital formation and less tax revenue. Therefore, some permanent cut in the corporate tax rate can be found which will be more desirable than the preservation of the status quo, which is ensured by the time inconsistent strategy. More generally, the likely policy outcomes within the general structure represented in Figure 1 are listed in Table 1 below.

		AGENTS' EXPECTATIONS	
		Do Not Anticipate	Do Anticipate
GOVERNMENT STRATEGY	Time Inconsistent	BEST	BAD
	Implement Announced Plan	BAD	GOOD

Table 1: Possible Policy Outcomes

Looking at the second column, we see that implementing some anticipated, announced plan is more desirable than the anticipated time inconsistent strategy. The first column asserts that an unanticipated time inconsistent strategy would be better than implementing an unanticipated announced plan. This is due to the fact that the rationale for implementing an an-

nounced plan is thwarted by agents' incorrect belief that the time inconsistent strategy will be implemented instead. Also, the table states that the government views an unanticipated time inconsistent strategy to be better than an anticipated announced plan. If, as was argued earlier, it is likely that the government's actions will be anticipated by the affected public, then the second column asserts that the government should implement some announced plan. This table, however, gives no guidance as to how this plan could be formulated.

One possible way to formulate a desirable policy is to continue the status quo prevailing at the time of plan formulation. For example, the government could implement a policy of permanently freezing the corporate tax rate at its current level. This obviates the need for government planning, and has the advantage of incurring little or no administrative cost. However, the real "expense" of such a policy is usually greater than this, for such a policy usually results in lost opportunities for improving matters. For example, freezing the corporate tax rate precludes the government from taking the opportunity to cut the rate. This makes it impossible to use this tool to strike a more desirable trade-off between capital formation and tax revenue. Of course, there is no guarantee that the government will, in fact, choose the "right" rate. Such a decision will always be made with some uncertainty about the trade-off which will result from it. Unless this uncertainty is so severe that there is little likelihood of a better outcome, maintaining the status quo is not a good policy.

A better policy is to implement an announced and well-understood plan with good operating characteristics. While the government may not be able to calculate the best capital gains rate which strikes the trade-off between capital formation and tax revenue that they like best,

they may have much more confidence in stating that some permanent decrease in the rate is a good idea. Thus, the government could argue, for, say, a 20 percent decrease in the corporate tax rate implemented over a period of five years. While they might not be able to predict exactly what trade-off will result from this plan, they may feel confident that it will be better than the status quo. In the deficit spending problem discussed earlier, the government might choose to adopt a constitutional amendment requiring a balanced budget.

It is hard to be optimistic about the prospects that the government will implement announced plans, rather than pursue time inconsistent strategies. Even if current government authorities can be convinced to do so, there is no guarantee that future government officials will share this commitment. Hopefully, continuing discussion of time inconsistency will serve this end.