Dynamic (Time) Inconsistency

"Dynamic Inconsistency, Cooperation, and
the Benevolent Dissembling Government"
By Stanley Fischer

First introduced by Kydland and Prescott in 1977,
"Rules rather than Discretion: The Inconsistency of Optimal Plans"

Let's look at the Nobel prize description of this work:

Time-consistent Policy

In the late 1950s and early 1960s, the conventional wisdom, summarized in the so-called Phillips curve, was that economic policy could permanently reduce unemployment by allowing for high inflation. In the late 1960s and early 1970s, however, several researchers had begun to question this view. Milton Friedman (Laureate in 1976) and Edmund Phelps showed that there exists a long-run equilibrium level of unemployment independently of the rate of inflation. Unemployment can be reduced below this equilibrium level through higher inflation, but only in the short run. In the long run, inflationary expectations and wage increases adjust to actual inflation, which in turn brings unemployment back to its equilibrium level.

In the article from 1977, Kydland and Prescott extended the theory of economic policy. They showed that economic policymakers who cannot commit to a rule in advance often will conduct a policy that gives rise to high inflation, despite their stated objective of low inflation. The Laureates presented this as one of several examples of a general problem in economic policymaking: the *time consistency problem*. Since then, this concept has been at the forefront of research on – and the formulation of – economic policy.

Desirable Policies Often not Implemented

The essence of the time consistency problem is as follows: a policy which economic policymakers regard as the best option in advance, when it can influence households' and firms' expectations about policy, will often not be implemented later on, when these expectations have already been formed and shaped private behavior. Economic policymakers will therefore revise their decision, so that the policy they ultimately conduct will be worse than if they had had less discretion in policy choice. This result does not hinge on policymakers being guided by objectives different than those of citizens at large; rather, the difference appears in the constraints on the economic policy problem at different points in time.
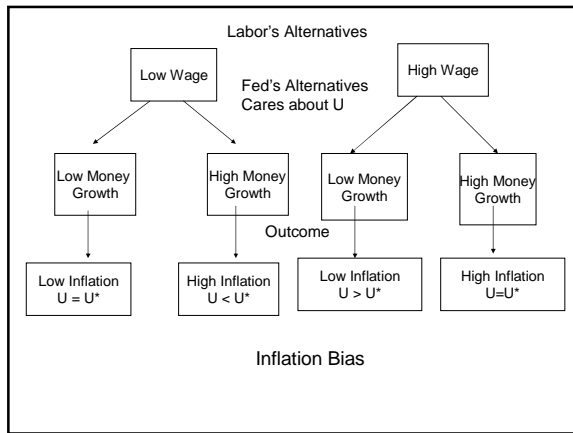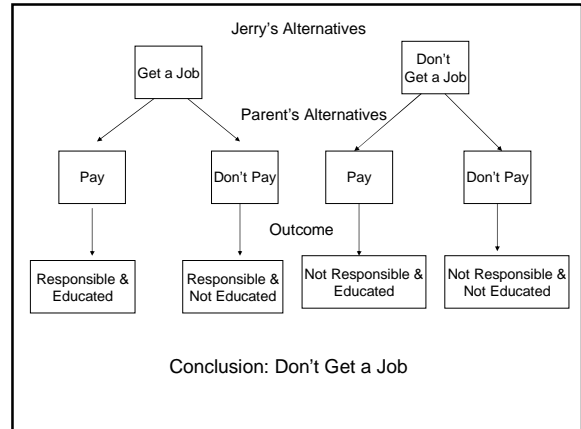

A noteworthy example of the time consistency problem can be found in monetary policy. Assume that the objective of policymakers is low inflation and that they announce such a policy. Assume further that this results in low inflationary expectations and therefore small wage increases. In retrospect, it may be tempting to conduct a more inflationary monetary policy (through low interest rates), as this would reduce unemployment in the short run. Kydland and Prescott demonstrated that such temptations could result in the economy becoming trapped in high inflation without any effect on unemployment. If employers and wage-earners understand the policymakers' motives, the announcement of low inflation loses its credibility: high and self-fulfilling inflationary expectations give rise to large enough increases in wages that unemployment never declines.

Kydland and Prescott's analysis provided an explanation for the failure to combat inflation in the 1970s. But analogous time consistency problems arise in many areas of economic policy. For instance, in their article, the Laureates analyzed a similar problem in tax policy. A government can pledge tax cuts for certain kinds of activity (such as investments) – but once the investments have been made, it can nevertheless withdraw the tax cut in order to increase tax revenue. The time consistency problem has become a standard ingredient in subsequent research on economic policy.

Impact on the Institutions of Monetary Policy

The Laureates concluded that time inconsistency between decisions at different points in time can be highly disadvantageous for society. In their 1977 article, the Laureates considered the possibility of conducting fiscal and monetary policy on the basis of long-run rules, which are difficult to change. A drawback of such rules, however, is that they can restrict flexibility in economic policymaking when unexpected events (business-cycle shocks) occur. Later research, on monetary policy in particular, has therefore concentrated on reforms that change the institutions of policymaking rather than reforms that introduce binding rules. This work has had a far-reaching impact on reforms carried out in many places (such as New Zealand, Sweden, Great Britain, and in the Euro area), aimed at legislated delegation of monetary policy decisions to independent central bankers with different kinds of pre-specified price-stability objectives.

Slide 1

Time Inconsistency

A Problem in Parenting

Slide 2

Jerry's Alternatives

Get a Job   Don't Get a Job

Parent's Alternatives

Pay   Don't Pay   Pay   Don't Pay

Outcome

Responsible & Educated | Responsible & Not Educated | Not Responsible & Educated | Not Responsible & Not Educated

Conclusion: Don't Get a Job

Slide 3

Labor's Alternatives

Low Wage   High Wage

Fed's Alternatives
Cares about U

Low Money Growth | High Money Growth | Low Money Growth | High Money Growth

Outcome

Low Inflation $U = U^*$ | High Inflation $U < U^*$ | Low Inflation $U > U^*$ | High Inflation $U = U^*$

Inflation Bias

Slide 4

Remember Prescott's Lecture

Why does the Principle of Optimality Fail?

Because people think and anticipate the future.

The situation is a sequential game:

1. In first period, Government announces policy.
2. In first period, Household's take action.
3. In Second period, Government can deviate from announced policy.
4. Household's anticipate this – a rational expectations equilibrium.

Slide 5

We will study Fischer's article – a model of optimal taxation in a two period setting.

We will solve this numerically – gets messy fast so we will use some software, *Mathematica*, to solve the problem.

But first an overview.

Slide 6

We will look at three economies

1. A model with lump sum taxes – this will be our base line model.

2. A model with distortionary taxes on capital and labor where the government can precommit to its policy.

3. A model with no commitment mechanism. This is harder to analyze and involves several steps.

Solving the economy with no commitment mechanism

We solve the model by working backwards:

1. In period 2, the government takes the household's decision of capital made in period 1 as given and then chooses optimal taxes on capital and labor. We will show that the tax on labor = 0 while the tax on capital is a function of the capital stock chosen in period 1.
2. Households make choices in period 1 – in particular, they choose capital. This is a function of the tax rate.
3. We require that the tax rate that household's expect in period 1 is equal to the tax rate chosen by the govt. in period 2 (this is the rational expectations assumption).

There are a lot of steps… and we use indirect utility repeatedly, so pay attention!

Now – on to Mathematica file.