

**Presentation of the 2006 Sveriges Riksbank Prize in Economic Sciences in  
Memory of Alfred Nobel to Edmund Phelps “for his analysis of intertemporal  
trade-offs in macroeconomic policy”**

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The most difficult problem of economic policy is that one wants to achieve a number of goals, such as low unemployment, price stability and high consumption both now and in the future, but that these goals cannot all be achieved at the same time. There are usually serious goal conflicts.

- One is how to balance inflation and unemployment against each other.
- Another is how to trade off the consumption of current generations against that of future generations.

These are the issues that **Edmund Phelps** has worked on. He has emphasised that, not only the issue of how much society should save for the benefit of future consumption, but also the balance between inflation and unemployment, is really an issue about the distribution of welfare over time. There are conflicts between what can be achieved in the short run and what can be achieved in the long run.

Up till the beginning of the 1970s, the general belief was that there existed a stable relationship between inflation and unemployment. This was the so-called *Phillips curve*. According to it, one could reduce unemployment through monetary and fiscal policies, which increase aggregate demand: there would be a price, but it would just be a one-time increase in inflation from one rate to another.

What Phelps did in the late 1960s was to challenge this view. He recognised that inflation does not only depend on unemployment but also on *expectations* of inflation. When deciding prices and wages, firms and employees base their decisions on their beliefs about price and wage developments in general. Phelps formulated the first model of what has become known as the *expectations-augmented Phillips curve*. It says that, for a given unemployment rate, a one percentage point increase in expected inflation raises also actual inflation by one percentage point.

This reformulation of the Phillips curve may seem very simple, but it had absolutely fundamental consequences. It implies that in the long run, as people learn about the true rate of inflation, the economy will tend towards an *equilibrium rate of unemployment*. This means that it is just not possible to achieve any unemployment rate in the long run through aggregate demand policy. The equilibrium rate is instead

determined by how well the labour market functions. But it does not depend on the rate of inflation.

If governments and central banks keep unemployment below the equilibrium rate through demand policy, the consequence will *not* be a *stable* higher rate of inflation, as one believed earlier, but *accelerating* inflation. Indeed, was exactly what happened in the world economy in the first half of the 1970s, a few years after Phelps published his first research in the area .

There have been innumerable empirical studies that have found support for the expectations-augmented Phillips curve Phelps formulated. It is in fact one of the empirically most studied relationships in economics, perhaps *the* most studied one.

The expectations-augmented Phillips curve has been of immense practical importance because it clarifies what monetary and fiscal policies can achieve and what one must achieve through other means. As a consequence, monetary and fiscal policies are today conducted in a completely different fashion than before. For example, central banks try routinely to assess what the equilibrium rate of unemployment is and they try to stabilise unemployment around it rather than to use monetary policy to deviate from it.

Phelps also emphasised how inflation today affects inflation expectations in the future. So, one can see a policy of low inflation today as an investment in low inflation expectations, which will allow more room for manoeuvre in stabilisation policy in the future.

Viewing low-inflation policy as an investment was natural to Phelps against the background of earlier work that he did in the 1960s on *capital formation*. This work analyses what rate of capital formation is desirable. How much should society consume now and how much should it invest to increase the capital stock, and boost future production (and consumption)? These are crucial questions for how consumption and welfare is distributed across *generations*.

Phelps started out from what he labelled *the golden rule*, which is a characterisation of what savings rate gives the highest possible consumption level in the long run in a situation where all generations are treated equally: the term golden rule here is a reference to the ethic of reciprocity in the Bible: “Do unto others as you would have them do unto you”.

However, it is not obvious that a society should try to reach as high consumption as possible in the long run, because there can be distributional conflicts among generations. Higher savings now can benefit future generations. At the same time they reduce consumption for current generations. But there can also be situations where all generations benefit from changes in savings.

The economy can be characterised by what Phelps called *dynamic inefficiency*: savings can be so high that all generations would benefit from a reduction. An example is the earlier socialist economies: they invested so much that they had problems keeping pace with the depreciation of the capital stock without pressing down consumption to very low levels.

Together with Robert Pollak, Phelps also analysed how all generations may save too little because too little weight is attached to future generations. At the same time, we may feel bad because future generations are likely to act in the same way as we do – so, we would like our children to save more for our grandchildren than our children will in fact do. If this is the case, all generations would benefit from increased savings, which can come about, for example, through some types of mandatory pension schemes.

A main contribution is that Phelps extended the analysis of capital formation also to human capital formation, to investment in research and education, which had not earlier received enough attention in economic research. Together with Richard Nelson, he developed an analysis that stressed the importance of a large *stock* of human capital – a well-educated work force – for the diffusion of technology. This analysis explains why growth seems more strongly related to the existing level of education than to changes in it, and it opened up for very important later developments in growth theory. The analysis also helps explain why wage

differentials often increase during periods of fast technological growth – such as with the diffusion of information technology – because education is then particularly valuable.

To sum up, Phelps has analysed conflicts between short-term and long-term objectives in economic policy. His analyses of inflation and unemployment in the late 1960s had a very quick and fundamental impact on both research and practical policy. His earlier analyses of capital formation have also had strong and lasting effects, but here the full importance of some of results has not been realised until much later.

Although inflation/unemployment and capital formation may at first sight seem as two very different research areas, they are closely related in Phelps's work. This is the reason why the Academy has chosen to award him the prize for "his analysis of intertemporal tradeoffs in macroeconomic policy".