

# Bernacer Prize: Acceptance Speech

Stephanie Schmitt-Grohé

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I would like to thank very much the Bernacer Prize selection committee and its sponsors for awarding me this prize. I am deeply honored to be the recipient of this prestigious award.

This prize was awarded for my work of developing and applying tools for the evaluation of macroeconomic stabilization policy to economies with nominal frictions. Much of that work was the product of my collaboration with Martin Uribe. Martin is not only my co-author but also my husband and father of my two sons who are here today. So many thanks go to him. Unfortunately he could not be here today.

I also would like to thank my parents, who are here today, for their support.

The prize was awarded for our recent work on macroeconomic policy evaluation.

Let me begin by telling how we got started on this topic. In 1999, several countries in Latin America were actively debating whether to replace the domestic currency with the U.S. dollar, that is, they were considering

dollarization. This was particularly the case in Argentina, Brazil, Ecuador and Mexico.

Of those governments, the Mexican seemed least interested in dollarization. However, a group of Mexican businessmen got interested in the idea and gave money for an academic conference that should analyze the pros and cons of dollarization for Mexico. ITAM got to organize this conference and Martin and I were invited to contribute a piece.

I should admit that we were a little sceptical whether we should participate in this project. We were just a few years out of graduate school and thought that perhaps taking on a commission was not the right thing to do at that point in our career.

At the same time, we felt that as macroeconomists we should be able to provide some useful analysis on the question whether Mexico should adopt the U.S. dollar as legal tender.

Proponents of dollarization argued that by eliminating devaluation risk, dollarization will go a long way toward reducing country risk premia, thus lowering aggregate volatility.

On the other hand, opponents of dollarization warned that this way of reducing country risk comes at a cost that may very well exceed its benefits. We thought we could contribute to the dollarization debate by examining one of its potential costs in detail.

In particular, one source of costs arises from the fact that under dollarization a country relinquishes its ability to conduct cyclical monetary policy.

This particular cost of dollarization is similar to the costs that arises under a currency union like the EMU.

To policy makers it is probably obvious that the absense of monetary stabilization policy be of concern. However, to an academic this may not be so obvious. In a world without any nominal frictions, money and hence monetary policy is irrelevant. For example, in the seminal business-cycle model of Kydland and Prescott of 1982, (which was one of the papers cited by the nobel committee for their decision to award the nobel prize to the authors), there is no room for monetary stabilization policy.

This model was so successful that by the late 1990s empirical research using macroeconomic data from industrialized countries had shown that amending it with various forms of nominal and real frictions allowed one to provide a rather close account of actual aggregate fluctuations.

What is now called the new Keynesian paradigm emerged as an framework for understanding business cycles. One key difference between the neoclassical and the new Keynesian paradigms is that in the latter, the presence of various nominal and real distortions provides a meaningful role for stabilization policy, opening the door once again, after decades of dormancy, for policy evaluation.

Going back to the case of Mexico (or for that matter to the case of the European Monetary Union) this means that if one believes in the existence of nominal frictions, such as sluggish price and wage adjustment, monetary policy can play an important role in stabilizing business cycles.

Because U.S. monetary policy is likely to respond mainly to that country's state of the business cycle and not Mexico's, dollarization will come at the cost of higher (or suboptimal) macroeconomic instability. Similarly, because the ECB's monetary policy will respond to conditions in the monetary union as a whole rather than to conditions in a specific member country, the monetary union comes at the cost of forgoing country-specific monetary stabilization policy.

So we set out to quantify the cost of dollarization arising from the reduced ability to accommodate shocks with monetary policy.

To carry out this exercise we needed three inputs.

1. a reasonable quantitative model of the business cycle (model and shocks)
2. an idea of what the best monetary policy was
3. a way to compute the welfare losses of dollarization vis-a-vis the best monetary stabilization policy.

We soon realized that we could provide none of those three ingredients. And filling in those gaps has occupied much of our time for the following 5 years.

Our contributions mainly lie in trying to provide ingredients (2) and (3), that is, characterizing optimal monetary and fiscal policies in models with a number of nominal and real frictions and developing tools that allow one to compute welfare consequences of alternative (suboptimal) monetary policies in medium-scale macroeconomic models.

A well-known result in macroeconomic theory is that optimal fiscal and monetary policy features smooth distortionary income tax rates and highly volatile and unpredictable inflation rates. The intuition behind this result is straightforward: surprise inflation is equivalent to a lump-sum tax on nominal asset holdings. A benevolent government should finance innovations in the fiscal budget, such as government spending shocks or unexpected declines in the tax base, through surprise changes in the price level. In this way, distortionary tax rates can be kept relatively stable over time.

In calibrated model economies, under the Ramsey optimal policy, the public would be accustomed to seeing inflation rates jumping from -15 percent to +15 percent from one year to the next. This result is completely at odds not only with observed inflation behavior but also with the primary goal of most central banks around the world, namely, price stability.

We argue that the price stability goal of central banks can indeed be justified on theoretical grounds. One key assumption of existing studies on optimal monetary and fiscal policy is that there are no impediments to nominal price adjustments. In one of our papers, we relax this assumption and instead assume that product prices are sticky.

Obviously, by making price changes costly, we expected to obtain the result that under the optimal policy inflation is less volatile than in an economy with flexible prices. But our findings went way beyond our expectations. It turned out that the introduction of a miniscule amount of price stickiness, less than ten times the degree of price stickiness estimated for the U.S. economy

(or Europe) , suffices to make price stability the overriding goal of optimal monetary policy.

Specifically, even when firms are assumed to be able to reoptimize their pricing policy every three to four weeks (while empirical studies suggest that such reoptimization is done only every nine months), the optimal volatility of inflation is below 0.52 percent per year, which is 13 times smaller than the optimal inflation volatility predicted under full price flexibility.

One may naturally expect that the reduced inflation volatility under the optimal stabilization policy would have to be compensated by increased unpredictability in income tax rates. But this is not the case. Under the optimal stabilization policy surprises to the fiscal budget are financed mainly through adjustments in the stock of public debt. By using government debt as a shock absorber, the optimal stabilization policy results in smooth tax rates over time.

For instance, an unexpected fiscal deficit calls for a permanent increase in debt in the amount of the fiscal deficit and a small but permanent increase in taxes equal in size to the interest payments on the additional debt. Consequently, tax rates and government debt display a near random walk property.

It follows that the mere introduction of a small amount of price stickiness resurrects the classical Barro tax-smoothing result. This result stands in contrast to those obtained under flexible prices. In this case, tax rates inherit the stochastic process of the underlying shocks, and thus, in general, will not

display the near-random walk property.

One obstacle we encountered early on this research agenda was the lack of appropriate tools for evaluating stabilization policies in the context of distorted economies. An important part of our effort was therefore devoted to developing such tools.

Most models used in modern macroeconomics are too complex to allow for exact solutions. For this reason, researchers have appealed to numerical approximation techniques.

However, most of the existing numerical techniques that would allow us to evaluate the welfare consequences of alternative policies suffer from the so called ‘curse of dimensionality’. That is as the number of state variables becomes large, the numerical method becomes impossible to implement.

Martin and I thus worked on developing further techniques which have the advantage that they do not suffer from the curse of dimensionality, in particular on second-order perturbation methods.

Our main practical contribution is the development of a set of MATLAB programs that compute the coefficients of the second-order approximation to the solution to the general class of models. This computer code is publicly available at our websites.

After the completion of the second-order approximation toolkit, we felt that we were suitably equipped to undertake a systematic and rigorous evaluation of stabilization policy.

A contemporaneous development that helped to facilitate our work was

the emergence of estimated medium-scale dynamic general equilibrium models of the U.S. economy with the ability to explain the behavior of a relatively large number of macroeconomic variables at business-cycle frequency.

Returning once more to the case of Mexico, we find that the costs of adopting dollarization as the monetary policy rather than say follow a strategy of inflation targeting are small.

Similarly, for the U.S. economy, we find that there exists a large class of simple interest rate feedback rules that entail rather small welfare costs vis-a-vis following the optimal stabilization policy. To give an idea of the magnitude, we find numbers in the range of 0.017 percent of consumption, that is, about 40 cents per months per person.

Of course, such conclusions are still preliminary. For one they crucially depend on the assumed structure of exogenous shocks. For example, in our work it is assumed that supply shocks, or more precisely, a technology shocks explains the great majority of economic fluctuations at business cycle frequencies. Other authors, who have found much larger numbers for the welfare costs of suboptimal monetary policy, have relied on estimated medium-scale models with a much richer structure of shocks in which technology shocks play a smaller role.

It remains as a challenge for future research to determine the essential driving forces of business cycles as those are key in determining optimal stabilization policy and its value to society.

Thank you.