

Preface

The essays collected in this volume bring together papers that I and my coauthors, Alexandre Barros da Cunha, Elvia Mureb Sallum, Tito Nicias Teixeira Filho, and Waldyr Muniz Oliva, wrote during a period of more than twenty years. The main goal of this research was to build a theoretical framework that could explain chronic inflation and hyperinflation. These two phenomena are grounded in a fiscal monetary regime where money is issued to finance public deficits.

I have also included a chapter providing an abridged survey of the literature of hyperinflation models. I show in Chap. 1 that most of these models attempt to explain hyperinflation as a bubble phenomenon since they hold constant the fiscal deficit to be financed by money. It is not unfair to state that the bubble explanation of hyperinflation was not a satisfactory account of this phenomenon.

To understand chronic inflation, Latin American economists developed the theory of structural inflation in the 1950s. I myself Barbosa (1983) conducted an econometric test of the two competing hypotheses: the structuralist and the monetarist. The test was not conclusive. However, after getting in touch with the hyperinflation literature I realized that a key ingredient was not included in the inflation models; both the structuralist and the monetarist one, the government budget constraint. Chapter 2 shows that chronic inflation can be understood by using the old Keynesian model, consisting of an IS curve, an LM curve, and a Phillips curve.¹ The only additional equation in this model is a monetary policy rule stating that the public deficit is financed by issuing money, derived from the government flow budget constraint. In such environments, of chronic inflation, money is endogenous since the inflation tax is used to finance the public deficit. This four-equation model can be reduced to two equations in two endogenous variables,

¹Pazos (1969), english version Pazos (1972) was the first economist to write on chronic inflation in Latin American countries (Argentina, Brazil, Chile, and Uruguay). However, he did not present a formal model that would take care of both the propagation mechanism and the source of chronic inflation.

the rate of inflation and the real quantity of money, and a simple phase diagram can be used to analyze the properties of the model.

In chronic inflation countries some indexation mechanism is used to adjusting prices and wages, yielding the inertial component of inflation. The Phillips curve would have a parameter that takes care of indexation mechanisms as well as price rigidity. Chapter 3 uses the chronic inflation model of the previous chapter to analyze the changes in the dynamics of inflation when there is a change in the real fiscal deficit. This change is tantamount to a bifurcation that yields a qualitative change in the dynamical system. This bifurcation, a Hopf bifurcation, yields a limit cycle. In the region circumventing the equilibrium points, there are hyperinflation paths. These hyperinflation paths are bubbles since the fundamentals of the model are constant. However, some shocks, such as a heterodox stabilization program that freezes wages and prices, can put the economy in a hyperinflation path.

Chapter 4, which I have written for this volume, analyzes chronic inflation in the New Keynesian model. This model has become the workhorse for the analysis of monetary policy. This theoretical framework has two equations and three variables: inflation, output gap, and the nominal rate of interest. To close the model it uses an interest rate rule, such as the Taylor rule, since most central banks have the long-run goal of targeting inflation. This chapter analyzes the New Keynesian model with a different monetary policy rule, one in which the central bank has as its goal to finance the public deficit issuing money.

Chapter 5 addresses the issue of money essentiality by using a representative agent model with money in the utility function under a monetary policy regime, whereas the central bank controls the stock of money. It is shown that the money essentiality hypothesis can be tested using the inflation tax curve. This essay also clarifies the difference between a conventional bubble and a steady-state speculative hyperinflation equilibrium.

Chapter 6 complements and overlaps to some extent with the previous chapter addressing the issue of money essentiality in the same setup but under a fiscal monetary policy regime, e.g., a regime in which the central bank finances the public deficit. In the monetary regime, there is hyperinflation equilibrium when the money demand inflation elasticity is greater than one. In the monetary fiscal regime such equilibrium exists when the money demand elasticity is less than one. Hyperinflation can occur instantaneously in one shot when the public deficit financed by money is greater than the inflation tax that can be collected on a permanent basis from the society. However, the empirical evidence shows that hyperinflation is not a one-shot game.

When a central bank issues money to finance government expenditures, this fact has a dual interpretation. It is a monetary policy rule and a government budget constraint, at a point in time and overtime. I would like to point out that to have a full understanding of hyperinflation, the best approach is to use the government budget constraint interpretation. It allows one to highlight the sustainability of this economic policy regime, which is the core of the hyperinflation pathology.

Chapter 7 uses a representative agent general equilibrium model with flexible prices and a fiscal monetary policy regime to show that hyperinflation equilibrium

exists. The model developed in this chapter departs from previous hyperinflation models because it is based on the intertemporal government budget constraint instead of the flow budget constraint used in the models of Chap. 1. In this model the length of time that hyperinflation lasts depends on the size of the fiscal crisis, which is a key ingredient in the model. This framework is akin to the models used to explain the pathologies of debt crises, both public debt and external debt. The model can be reduced to a nonautonomous differential equation, with a very simple phase diagram representation.

The hypothesis embedded in the flexible price model used in Chap. 7 may be criticized arguing that the Keynesian rigid price framework would be more appropriate to model hyperinflation. The flexible price hypothesis can be supported by the fact that as hyperinflation goes by, prices become more flexible. However, it is possible to set up a Keynesian model that would reach the same conclusions of the flexible price model. Therefore, the hyperinflation intertemporal framework is robust to the hypothesis used with respect to the price system, whether it is flexible or rigid.

Chapter 8 is indeed a note commenting some pitfalls that have plagued the literature on hyperinflation. This chapter proves that a constant deficit financed by issuing money would not yield an equilibrium hyperinflation in the model of the previous chapter. A constant deficit could produce a flight from money due to a bubble because it does not fulfill all the conditions required for being a solution of the model.

Chapter 9 extends the hyperinflation theory of Chap. 7 and presents the empirical evidence for the Brazilian economy with data that cover the period 1947–2003. The Brazilian hyperinflation started in the first half of the 1980s and ended in 1994 with the Real Plan. The theory presented in this chapter allows hyperinflation taxonomy, namely (1) bubble; (2), weak and (3) strong hyperinflation.

When the inflation tax revenue increases as the rate of inflation increases and the public deficit to be financed by money is constant, there is a possibility of a bubble. This is a self-generating hyperinflation based on self-fulfilling expectations. We cannot dismiss this hypothesis a priori since it is feasible to test it. However, another way to look at this possibility is to look at the fiscal stance, e.g., how the public deficit is being financed.

Under a fiscal crisis when the inflation tax revenue ends up decreasing as the rate of inflation increases, the real quantity of money is still positive at the end of hyperinflation. In this case, we have a weak hyperinflation. This hypothesis predicts that the economy can be on the “wrong” side of the Laffer curve during hyperinflation. This outcome, contrary to conventional wisdom, presents a solution to an old puzzle of the hyperinflation literature.

Under a fiscal crisis if the inflation tax revenue increases when the rate of inflation increases, the real quantity of money tends to zero as time approaches the end of hyperinflation. In this case, we have a strong hyperinflation. Thus, the particular hyperinflation path depends on the functional form of the inflation tax revenue curve. The inflation tax revenue curve is used in the empirical study as a tool to discriminate among the different hyperinflation hypotheses. The bubble and

the strong hyperinflation hypotheses are rejected using Brazilian data. The weak hyperinflation hypothesis is not rejected, and the Brazilian economy could have been on the “wrong” side of the Laffer curve.

The research reported in this volume aims to understand the mechanics of hyperinflation, which is produced by an unsustainable intertemporal budget constraint that brings about the price of money to zero. However, this research did not address a deeper question, namely why a society chooses such economic policy regime when other options to finance the public sector are available? This question was outside of our scope and it is in the realm of political economy. To fully understand the pathology of hyperinflation, this question needs to be answered since the deep root of this phenomenon is a social conflict that has to be analyzed to understand why society has chosen such economic policy regime.

I would like to thank my coauthors, Alexandre, Elvia, Tito, and Waldyr, for their contributions in this joint work. I have an intellectual debt to all of them. If it were not for their contributions, these papers would not have been written.

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