Chronic inflation in an industrialising economy

The Brazilian experience

VINCENT PARKIN

CAMBRIDGE UNIVERSITY PRESS
Cambridge, New York, Melbourne, Madrid, Cape Town, Singapore,
São Paulo, Delhi, Dubai, Tokyo

Cambridge University Press
The Edinburgh Building, Cambridge CB2 8RU, UK

Published in the United States of America by Cambridge University Press, New York

www.cambridge.org
Information on this title: www.cambridge.org/9780521134125

First published 1991
This digitally printed version 2010

A catalogue record for this publication is available from the British Library

Library of Congress Cataloguing in Publication data
Parkin, Vincent
Chronic inflation in an industrialising economy: the Brazilian experience
/ Vincent Parkin.
p. cm.
Based on the author's thesis (Ph. D.) – University of Cambridge.
Includes bibliographical references and index.
ISBN 0–521–37540–1
1. Inflation (Finance) – Brazil. 2. Prices – Brazil. 3. Wages –
Brazil. 4. Inflation (Finance) – Brazil – Econometric models.
I. Title.
HG835.P37 1990
332.4'1'0981 – dc20 90–41079 CIP

ISBN 978-0-521-37540-5 Hardback
ISBN 978-0-521-13412-5 Paperback

Preface

This book grew out of a Ph.D. thesis presented in the Faculty of Economics and Politics of the University of Cambridge. Besides doing away with a most unwieldy title, revising some of the econometric work in chapters 3 and 4 and, making a series of minor revisions throughout, the primary change made has been to rewrite chapter 1 in collaboration with T. G. Srinivasan of the University of Glasgow and the Indian Economic Service and Professor David Vines of the University of Glasgow. In its new form, chapter 1 offers a rigorous theoretical analysis of structural inflation and its interactions with money and finance. A new section has also been added to chapter 2 on Brazil's recent experience with inflation and stabilisation.

A great debt of thanks is due to Professor David Vines for his encouragement, guidance and enthusiasm not only during his time as my thesis supervisor at Cambridge but also in the run up to publication of this book. I am also grateful to Mr Ken Coutts of the Department of Applied Economics at Cambridge for his helpful assistance and for allowing me to make use of the Cambridge Economic Policy Group's *Model Processing System* to carry out the simulation exercises in this book.

As a research student at Cambridge I benefited greatly at various stages from the financial support of the Commonwealth Scholarship Commission in the United Kingdom, the Social Sciences and Humanities Research Council of Canada, as well as the European University Institute in San Domenico di Fiesole, Tuscany, where I spent a fruitful and stimulating period.

My Brazilian colleagues at Cambridge, Roberto Viana Batista and Maria de Lourdes de Medeiros Kain both went out of their way to assist a non-native embarking upon a study of their country's economy. For this and for their friendship I am grateful. During our time together as research students, Sveinbjörn Blöndal became a valued colleague and friend.

To Helen Dunkley I owe my thanks for her moral support as well as her invaluable assistance in preparing the original manuscript.

Naturally the usual disclaimers apply.

Contents

Introduction

This study seeks to shed light upon the nature of the chronic price inflation that today afflicts many of the world's developing economies, as it has done for decades. Chronic inflation, measured in increases in the price level of tens and sometimes hundreds of per cent per year, profoundly affects the pattern of a country's economic growth and development, its political and social fabric and the wellbeing of its citizens.

The specific focus of this study is the Brazilian inflation in the period from the military *coup d'état* of 1964 up to the mid-1980s – its root causes, the processes by which it became self-perpetuating and its interactions with government's macro- and microeconomic policies.

While the focus is on Brazil, both the conceptual framework applied to the problem and the lessons to be learned from the empirical analysis should be of general interest for other high inflation industrialising economies – especially those in Latin America.

Attempts to explain the causes of high and volatile rates of inflation in Latin America, as well as the policy prescriptions that flow from these explanations, have tended to fall into one of two categories – monetarist or a combination of structuralist and cost-push.

The monetarist perspective on inflation is now well known both in the industrialised and in the developing world. The roots of inflation, according to this school of thought, reside in an overly expansionary rate of increase in money and credit. Government's inability or unwillingness to tailor its expenditure to levels commensurate with available revenues is often cited as a cause of excessive monetary growth. Fiscal deficits that are not amenable to financing through the capital markets, given the thinness of these, are covered instead by borrowing from the central bank; in other words through monetary expansion.

The simple logic of the monetarist explanation and the apparently straightforward policy prescriptions that it throws up have proved persuasive to many especially where, as in the high inflation economies of

Latin America, rising price levels are indeed often accompanied by large fiscal deficits, financed through money creation. Yet the limitations of the approach are now also widely recognised and include such problems as the definition of 'money', the difficulty of sustaining the assumption of a clear 'one way' chain of causation between money and prices and, of particular relevance in the context of developing economies, a high degree of abstraction from a given institutional, political and historical context.

Those who have rejected narrowly based monetary explanations for the chronic Latin American inflations have tended instead to look, to varying degrees, at rigidities in the structures of production, trade and distribution as ultimate causes of inflation. The viability of 'structuralism' as an alternative basis to monetarism around which to organise economic policy has been hampered by difficulties in extracting simple policy prescriptions – particularly for the short term, a lack of attention to the financial side of the economy and, generally, to the absence of a widely accepted and clearly articulated framework for policy orientated analysis and planning.

The jumping off point for this study is the now widespread recognition that inflation in the industrialising economies of Latin America is typically a complex process of which neither a monetarist nor a naive structuralist cum cost-push diagnosis provides an adequate characterisation. Notwithstanding the above, the present study starts from the premise that the Latin American structuralist tradition provides a much richer and more promising basis than monetarism upon which to build a more general framework for the analysis.

A macroeconomic model developed here for the study of inflation provides a framework that allows for an explicit consideration of important interactions between structural and cost-push inflations on the one hand, and demand and financial factors on the other. In this way a bridge is formed between explanations for inflation centred upon the interaction of prices and wages with the 'real' economy, and predominantly monetary explanations for the same phenomenon.

On the level of economic policy-making, it is hoped that the present study, by helping advance the process of integrating the key tenets of structuralism into a more general macroeconomic framework, makes a contribution towards creating an improved basis for policy orientated analysis and planning in economies afflicted by chronic structural inflation.

Econometric techniques are used extensively in this study both to analyse the sectoral price formation process and also to estimate many parameters of the 'real' sector equations of the structural macromodel. This statistical method lends itself to the identification of multipliers and elasticities inherent in relationships between variables that are often too complex to be

gleaned from simpler statistical or graphical forms of analysis. By estimating a simultaneous system of equations, one is able tentatively to identify causal links and interdependencies between variables in a way that is not possible using reduced form models. Prices and inflation rates are so highly interdependent that it can prove even more difficult otherwise to sort out cause and effect. The aim has been to build with care a structural model of wage and price determination in order to impart a more solid foundation to the subsequent simulation and policy experiments. A brief note on the specific research methodology employed is presented in appendix 2.

Outline of the chapters

Part I introduces a proposed theoretical framework for the study of inflation as well as the specific problem to be analysed, namely inflation in Brazil. Chapter 1 begins with a brief review of the Latin American structuralist, and the more recent neo-structuralist, approaches to inflation. A formal model that captures the key tenets of the structuralist approach is developed and its properties are analysed qualitatively and graphically. A second version of the model is then presented which retains its structuralist character while also including an explicit role for stocks and flows of financial assets.

Chapter 2 is devoted to an overview of Brazilian inflation from the mid-1960s through to the present and to a review of existing interpretations placed upon this phenomenon. The concentration is on the period following the military *coup d'état* of 1964 up to the end of 1984. The choice of 1984 as the initial cut off point coincides with the end period used in the econometric analysis of later chapters. This in turn reflected the availability of data at the time the modelling exercise was begun.

The conclusion to emerge from this review is that many elements in the inflationary process have yet to be adequately explained in the literature. This is particularly true of the interaction between 'real' and 'financial' sectors and of the contribution of the food market to overall inflation.

In a final section of chapter 2, Brazil's experience with inflation since 1984 is looked at in brief. It is argued that the economic structure which is the focus of this analysis is not so different today relative to the early 1980s as to make the analytical content of this study of purely historical interest. On the contrary, the insights gained into the roots of inflation, the means by which it is propagated and becomes self-sustaining and the feedbacks between public policy and inflation remain very relevant to today's problems.

Part II comprises four chapters devoted to the microeconomics of pricing in the context of a developing economy. Each chapter is devoted to the

specification and estimation of models to explain particular prices. In each instance the principal relevant theories of pricing are reviewed with special emphasis upon the applicability of each in light of certain particular features of a developing economy. Also examined is the literature on the empirical testing of pricing hypotheses, with a view to identifying the 'best practice' modelling techniques. Despite a Brazilian bias, most of part II will be found to be applicable to the modelling of prices in developing countries in general.

Part II is sub-divided as follows: chapter 3 is concerned with price formation in manufacturing industry; chapter 4 with changes in average earnings in manufacturing; chapter 5 with price and output determination in the market for domestic foodstuffs; and chapter 6 with the cruzeiro/U.S. dollar exchange rate along with various aggregate price indices.

In part III a macroeconomic model comprising fifty-two definitional and stochastic equations is set out, validated and used in simulation exercises in an effort to identify the impact upon the economy of certain inflationary shocks and policy responses. The simulation period is 1966–83. Chapter 7 is devoted to an exposition of the model which is built around the core wage and price relationships identified in part II. An historical simulation of the complete model is performed in chapter 8 and its 'tracking' properties are evaluated. Multiplier analysis is then used to enquire further into the nature of the model, specifically as regards its stability. The counterfactual shock experiments performed also afford an initial look at how the model economy responds to inflationary stimuli from different sources. In chapter 9, we use the model to consider again some of the issues and processes discussed initially in part I. Policy experiments are performed to assess:

(a) the implications of changes in wage and exchange rate indexation regimes upon the response of the model to a foreign price shock, and
(b) the impact of a negative food production shock under three different assumptions about the reaction of policy-makers.

The study ends with a series of broad conclusions and suggestions for further research in chapter 10. It is here that we draw out the implications of the simulation exercises for an understanding of Brazil's inflation and, more generally, argue in favour of the relevance of an expanded structuralist approach for the study of inflation.

Caveats

The study covers a broad and complex topic and approaches it from more than one angle. At the same time, it is concerned with an investigation of a series of hypotheses about pricing at the level of individual markets and with the nature of the overall inflationary process. Of necessity, the

approach taken has required the exercise of considerable selectivity in the choice of issues and in the amount of detail with which each is treated. Compromises have had to be made.

Detailed limitations of coverage and analysis are pointed out at relevant junctures in the main body of the study. Here the principal limitations can conveniently be discussed under two headings:
(a) limitations in the investigation of wage and price determination, and
(b) limitations inherent in the empirical macroeconomic model.

As regards (a), the focus in part II is upon a few key prices. Determinants of other important prices, particularly those of raw materials and services, are not investigated. The degree of sophistication applied to the analysis of those prices considered is limited. The main reason, in both cases, stems from a lack of adequate data. Appropriate data series, as suggested by theoretical considerations or by 'best practice' modelling techniques, were in many cases unavailable and had either to be proxied by other series or left out of the analysis. The problem was found to be particularly acute in the formulation and estimation of food sector models. In other cases, the only data available were of questionable quality. These deficiencies limited the range of hypotheses that could be confronted properly with the data.

A further constraint upon the empirical analysis arose out of the relatively short number of observations available for important data series. This limited the generality of hypotheses that could feasibly be tested and imposed constraints upon the assessment of the statistical quality of the estimation results obtained. The study had to be carried out using annual data as no quarterly series were available for a range of key statistics; in particular, for national accounts aggregates.

Notable omissions from the wage and price relationships of the empirical model are explicit expectations variables. This is justified further on by reference to the pervasive nature of indexation in the economy which, to a large measure at least, replaced the role normally ascribed to independently formed expectations. This was particularly true in the wage determination process. Nonetheless, expectations of future prices, formed independently of known indexation plans, almost certainly had a role in price and wage formation that is not accounted for in our model. This comment applies most forcefully to the period beginning in 1986 when continuous, institutionalised indexation was abolished.

The second major set of limitations, referred to in (b) above, relates to the construction and use of the empirical macromodel. Constraints of time and space meant it was not feasible to construct a complete macromodel without drawing heavily upon the existing modelling literature for Brazil as a source for most of the non-price stochastic relationships. While in principle it represents good practice to build on the previous work of

others, the approach adopted did pose certain problems. Some relationships were clearly consistent with theory and institutional concerns as well as being statistically significant and robust. Others, however, left something to be desired in these same respects.

The model could benefit greatly from extension in two major directions. First, a much fuller modelling of the financial side of the economy would enrich the analysis of the financial implications of, and contributions to, the inflationary process by allowing interest rates, foreign capital inflows and credit variables, among others, to be endogenised. Secondly, if the serious data deficiencies in this area could be overcome, a disaggregation of income and expenditure flows for main social groupings – i.e. workers, capitalists and farmers – would permit explicit consideration of the important interactions between inflation and distributional issues.

A constraint imposed by the length of the study precluded more policy and counterfactual experiments from being performed with the model. While the analysis of chapters 8 and 9 gives a good indication of the model's characteristics and allows for explicit consideration of a number of issues, clearly many more experiments could have been performed to shed additional light upon the Brazilian inflation. In this vein, it is hoped that the study may form the basis for a future research agenda.

PART I
THEORY AND EMPIRICAL BACKGROUND

1 A theoretical framework for the study of inflation rooted in the Latin American structuralist approach

1.1 Introduction

Section 1.2 of this chapter is devoted to a review of Latin American structuralist views on inflation as first formulated in the 1950s and 1960s. Certain weak links in the analytical framework that emerged are highlighted along with general criticisms made of the structuralist approach. Key points of contrast with the monetarist viewpoint – this being the established orthodoxy confronting the new school – are noted although no attempt is made to review the extensive Latin American monetarist/structuralist debate.[1]

Section 1.2 ends with a note on a body of literature that appeared in the late 1970s and 1980s, very much rooted in the structuralist tradition but which represents a certain evolution in thinking, emphasis and presentation that justifies the use of the term 'neo-structuralist'.

A neo-structuralist type model forms the starting point for the derivation of a formal model in section 1.3 which encompasses the insights of the structuralist school while also including stocks and flows of financial assets. It is this construct that underpins the analysis carried out in subsequent chapters.

1.2 Latin American structuralism and the inflationary process

1.2.1 *The 'classic' literature*

A distinct Latin American structuralist school emerged during the 1950s out of the work of a group of economists, many of whom had associations with the United Nations Economic Commission for Latin America (CEPAL or ECLA), based in Santiago, Chile.[2] A central issue addressed by this school was the nature of a price inflation in middle-income developing countries.

Structuralism is best thought of as denoting an approach to, or method of analysis of macroeconomic issues rather than a specific theory. Structuralists considered that the fundamental explanation for chronic inflation in many parts of Latin America was to be found in the rigid and relatively unadaptable economic structures present in these countries. The perspective adopted was very much rooted in a particular Latin American historical and temporal context (Sunkel, 1958) and, as such, contrasted sharply with monetarism which tends to abstract from particular characteristics – be they institutional, historical or geographical – that may differentiate one economy from another. By virtue of the emphasis on economic structures, structuralism is ultimately concerned with longer-term phenomena and not with the short run. In this way, as well, there is a juxtaposition between structuralism and monetarism. As we note further on, an important characteristic of the more recent neo-structuralist work has been precisely to apply structuralist methods to an analysis of short-run problems.

Structuralists sought to explain the pervasive nature of inflation that characterised Latin America in the post-World War II period. Development was characterised by widespread import-substituting industrialisation and urbanisation that put great strains upon economic structures, particularly the structures of production and trade. Olivera (1964) has argued that countries going through this 'intermediate' stage of economic evolution – i.e. countries that are neither pre-industrial nor fully developed – are the most susceptible to structural inflation.

Underlying the structuralist position is the concept of 'required or acceptable growth' (Seers, 1962). Taken as given was the need to ensure adequate growth in national income, output and employment to meet the challenge posed by a growing population with rising economic aspirations, large portions of which had very low absolute standards of living. It was recognised that the existence of enormous political and social pressures compelled policy-makers to pursue growth. This point, while apparently obvious, is an important one because in some sense – although, for reasons to be illustrated further on, a largely irrelevant one – structural inflation can be 'cured' by accepting a permanent reduction in growth and developmental objectives – the main obstacle to this course of action being relentless population expansion.[3]

Structuralist reasoning started from the observation that as a by-product of development, great disparities arise between the growth of demand and supply in different markets, as the economic structure is insufficiently elastic to adapt continuously to match changing patterns of demand to supply (Pinto, 1968). For reasons connected with a country's historically given position in world trade or with backward economic structures in

certain productive sectors, the supply of key goods may be very inflexible and also subject to great volatility. Downward inflexibility of key relative prices and immobility of productive resources means that the price system alone cannot fulfil the role of ensuring that sectoral imbalances in demands lead only to relative price adjustments without influencing the general price level or its rate of change, as economic orthodoxy suggests they should. Rather, with a degree of downward inflexibility in important prices such as those of industrial goods and labour, bottle-necks in the supply of key goods can result in continuous inflationary pressures even in the presence of excess supply in other sectors. The result is that inflation may occur in the presence of overall excess supply.[4] This is the essence of a structural inflation and it is this that distinguishes it from an aggregate demand or 'demand-pull' inflation. The recurrent and endogenous nature of the inflationary pressure also sets apart structural from cost-push inflation. The latter is usually thought of as resulting from an autonomous rise in a key relative price due for instance to a foreign price rise or to an increase in real wages brought on by the exercise of market power by a particular social group.

An important distinction is made in structuralist thought between sources of 'basic inflationary pressures' and 'mechanisms of propagation' (Noyola, 1956). Confusion can arise when this distinction is not made, yet, in practice, it is often hard to sort out basic from propagating influences in the inflationary process.

1.2.2 *Basic pressures*

As alluded to above, basic inflationary pressures were argued to emanate from deficiencies in the structures of production and trade. The most often identified sources of such pressures were: first, stagnation or slow growth in the supply of food; and, secondly, an inability to expand and diversify exports – and to increase the purchasing power of these – at a pace sufficient to finance required imports.[5]

It was argued that the traditional pattern of land tenure characteristic of much of Latin America – whereby large and often unproductive estates belonging to the rural oligarchy dominated – served as an impediment to the expansion of output and productivity in agriculture.[6] Moreover, traditional food crops and animal by-products for domestic consumption suffered disproportionately as the more modern subsectors of agriculture tended to be engaged in export orientated production. The relative rigidity in food production has important consequences for prices and inflation.

Agricultural markets tend to adjust to disequilibria between supply and demand through price changes whereas industrial markets are more likely