

Carl-Ludwig Holtfrerich
The German Inflation 1914–1923

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Causes and Effects
in International Perspective

Translated by Theo Balderston



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Dr. Carl-Ludwig Holtfrerich
Professor at the Freie Universität Berlin
John-F.-Kennedy-Institut für Nordamerikastudien

Dr. Theo Balderston
University of Manchester
Department of History



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Table of Contents

List of Tables	VII
List of Diagrams	X
List of Abbreviations and Conventions.....	X
Acknowledgments	XI
 Introduction	 1
The Current State of Research	1
Objectives of the Present Study	4
 Part One: Statistical Measures and their Problems	 9
Chapter 1: Classifying Inflations	11
Chapter 2: Price and Purchasing Power Movements	15
2.1. Exchange Rates and Wholesale Prices	15
2.2. The Cost of Living	25
Index number problems.....	25
Various cost-of-living indexes	28
Chapter 3: Changes in the Money Supply and Liquidity	45
3.1. Some Theoretical Considerations	45
3.2. Empirical Evidence	49
The money supply	49
Liquidity	63
3.3. Measures of Monetary Overhang	79
 Part Two: Explaining the Inflation	 95
Chapter 4: Theoretical Preliminaries.....	97
Chapter 5: The Determinants of Monetary Expansion.....	102
5.1. The Fiscal Policy of the Reich	102
War financing: some theoretical considerations	102
War financing: practical proposals, measures, results	108
Fiscal and monetary policy options in 1919.....	119
The influence of Reparations.....	137

5.2. The Credit Policies of the Reichsbank	155
Critical exposition of the balance of payments and quantity theories	156
Which theory did the Reichsbank hold?	163
The discount policy of the Reichsbank	172
Chapter 6: Other Explanatory Factors	181
6.1. The Short-run Determinants of Production.	181
6.2. Factors Affecting the Demand for Money	184
6.3. Conclusion: Ranking the Reasons for the Inflation.	192
Part Three: The Effects of the Inflation	195
Chapter 7: Employment, Fluctuations, Growth	197
7.1. The Domestic Economy	197
7.2. The World Economy	206
Chapter 8: Distributional Effects within Germany	221
8.1. The Context and Contours of the Debate	221
8.2. Changes in National Income	223
8.3. Changes in Real Wages	227
Wage statistics: their origins and reliability	227
Wage statistics: findings	231
Statistics of consumption: problems	248
Statistics of consumption: findings	251
Statistics of health	262
8.4. The Distribution of National Income.	265
The functional distribution of income	266
The personal distribution of income and wealth.	271
Chapter 9: Inflation and the International Distribution of Income	279
9.1. Preliminary Observations.	279
9.2. Methods of Calculation and Findings.	281
9.3. A Cost-Benefit Evaluation.	297
Chapter 10: Ending and Mending: Stabilization and Revaluation	301
10.1. Stabilization.	301
10.2. Revaluation of Debts	318
Summary and Conclusions	331
Bibliography.	335
Index of Subjects	359
Index of Persons	368

List of Tables

1. Comparative movements of the German wholesale price index and the dollar/mark exchange rate 1914–1923.....	17
2. Indexes of the undeflated and real trade-weighted value of the mark against foreign currencies 1920–1923	23
3. Foodstuffs in the basket of goods underlying the Reich Statistical Office's cost-of-living index 1920–1925.....	31
4. Index of the cost of living in Germany, February 1920–December 1923.....	33
5. The cost of food for a family of five (husband, wife, three children) in Hamburg, January – December 1920	35
6. Fees at Prussian state higher education institutions 1909–1923 ...	36
7. Price indexes for 3rd class railroad fares per km and for streetcar fares in Berlin, 1913–1923	37
8. Weekly cost of minimum subsistence for a family of four in Berlin according to R. R. Kuczynski; 1920–23 compared with 1913/14 ..	40
9. Index of the average level of foodstuffs prices in two hundred German cities 1913–1922, compiled by Richard Calwer	43
10. Components of the money supply and the monetary base 1910–1923; annual data.....	50
11. Components of the money supply 1913–1923; monthly data	52
12. Deposits at the Reichsbank by class of depositor 1900, 1910, 1914, 1925.....	57
13. Current account (sight) deposits as percentage of total deposits at Prussian savings banks 1909–1925.....	58
14. Distribution of deposits at Berlin great banks by required notice of withdrawal 1913–1925.....	58
15. Deposits by other banks as percentage of total non-bank deposit liabilities 1913, 1924, 1925.....	59
16. Deposits at other banks as percentage of total assets of the Berlin great banks 1913–1924	59
17. Deposit liabilities of joint stock credit banks and savings banks as percentage of the deposit liabilities of all credit institutions other than banks of issue 1913, 1924, 1925	62
18. Deposits at various types of bank as percentage of the monetary base 1913–1922	63

19. The structure of the monetary base 1913–1922	63
20. Development of the Reich's floating debt, and the proportion held outside the Reichsbank 1914–1923.	67
21. The financing of Reich expenditure out of taxation and increase in the floating debt 1920–1922.	69
22. Deposit liabilities minus advances to clients expressed as percentage of deposit liabilities: joint stock credit banks 1920–1922	72
23. A selection of short-term interest rates 1920–1923.	73
24. Retail and black market prices in Berlin, 1914, 1919–1922.	88
25. Ordinary revenues of the Reich 1914–1919	112
26. Ordinary expenditures of the Reich 1914–1919	113
27. Over- or undersubscription of War Loans 1914–1918.	117
28. Composition of central government ordinary tax revenues in Germany and Great Britain in 1913 and 1918.	118
29. German reparations payments in cash and kind to August 31, 1924.	147
30. Yield of "inflation tax" compared with expenditures in compliance with the Peace Treaty.	150
31. Reparations payments as a proportion of German national income, and the German capital account balance with abroad 1925–1932. .	152
32. Growth of German industrial production 1913–1931	182
33. German grain production 1910–1931	182
34. The real value of the monetary base 1919–1923.	187
35. Unemployment among members of trade unions 1914–1923	199
36. Indexes of production in important sectors and branches of industry 1913–1918	201
37. The relative importance of sectors of industry according to the occupational statistics of the Social Insurance 1913–1918	201
38. Indexes of industrial production in France, Great Britain and Germany 1913, 1919–1931	204
39. German merchandise imports in 1920–1923 in comparison with 1913.	212
40. Indexes of real national income in Germany 1914–1924; also 1903–1913 and 1925–1935	224
41. Indexes of average real weekly wages of railway workers, printers and Ruhr miners as per collective agreements 1913–1923	233
42. Wages of skilled workers as percentage of wages of unskilled 1913–1923.	235
43. Real monthly salaries of typical categories of Reich civil servants in cities 1913–1923	235

44. The level of money wages and salaries in various industries, February 1920 compared with 1913/14	237
45. Real income levels in various industries, February 1920 as percentage of 1913/14	239
46. Indexes of the money and real hourly wage rates of 29 categories of workers in Frankfurt and district, as per collective agreements, 1920–1923.	243
47. Per capita consumption of various commodities in Germany 1920–1923 compared with 1913	250
48. The structure of expenditure of households of workers in typical income groups, 1907	252
49. The structure of expenditure of households in various income groups and of workers' households, 1916, 1917, 1918	252
50. Average per capita consumption of various foodstuffs 1916–1918 compared with prewar	255
51. The structure of expenditure of a higher civil servant's household 1913/14–1923.	257
52. Per capita consumption of various foodstuffs in the household of a higher civil servant 1913/14 and 1920–1923	258
53. Indexes of the money expenditure of the household of a Berlin doctor 1912–1922	260
54. The structure of the expenditure of a three-person household (middle-ranking salaried employees) 1912/13–1923	261
55. Fatalities from tuberculosis per 10 000 inhabitants in 46 German cities 1921–1923.	264
56. Data on the functional distribution of German national income 1913 and 1925–1931	268
57. The stratification of personal income in Germany 1913, 1926, 1928.	272
58. Changes in the stratification of personal income in Germany: 1928 as percentage of 1913	273
59. The stratification of wealthholding by individuals in Germany 1913 and 1923.	277
60. Changes in the stratification of wealthholding in Germany: 1923 as percentage reduction on 1913	277
61. The structure of the German balance of payments 1919–1923	284
62. Deposits at German banks 1918–1923.	288

List of Diagrams

1. Movements of German and United States wholesale prices measured in U. S. dollars, 1913–1923	19
2. Movements of average monthly prices of selected European currencies in U. S. dollars 1919–1922	21
3. Growth of the money supply and movements of wholesale prices in Germany 1914–1923	100
4. Growth of German industrial production 1913–1931	183
5. Monthly movements in the real value of the monetary base 1919–1922	188
6. Price and unemployment movements 1919–1922	202
7. Changes in real wages and salaries (hourly rates), as per collective agreements, 1920–22 as percentage of July 1914	240
8. Covered interest arbitrage between London and Berlin 1920–1922	291
9. International financial relationships and diplomatic objectives among the great powers after the First World War	308

List of Abbreviations and Conventions

Bd. Bde.	<i>Band, Bände</i> (i. e. volume, volumes)
bn.	billion, used in this work to signify one thousand millions
Heft, Hefte	issue, issues (as of a periodical)
Nr.	<i>Nummer</i> (i. e. number)
trillion	used in this work to signify one million millions
ff.	at least the two following pages (also volumes or years)

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As against the German original of the book (1980) I have incorporated some of the more recent literature into the English version. Some references to standard textbooks in English were added. I have also made minor corrections and additions.

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Carl-Ludwig Holtfrerich

Introduction

The Current State of Research

Three standard works, namely, those by Frank D. Graham,¹ Costantino Bresciani-Turroni,² and Karsten Laursen and Jørgen Pedersen,³ reflect the character of existing research on the course, causes and consequences of the German inflation of 1914–1923. They have the following in common:

- (1) They were all written by non-Germans, were published outside Germany and have not been translated into German. Despite the extraordinary importance of the inflation in German history, and the long shadow it has cast over subsequent events, the literature generated by German economic historians about the period is, to date, rather slight.
- (2) They all confine their attention to the period following the First World War, without due regard to the fact that the origins of the postwar inflation lay in the financial policy of the Reich during the War itself.
- (3) They were all written by economists with primarily theoretical interests.
- (4) Historical and archival source material that could provide information concerning the intentions of contemporary makers of economic policy, and the process of decision-making, was either not consulted by these authors, or was not then available for them to consult.

The differences between the three works relate above all to the theories underlying their explanations of the postwar inflationary process. Graham and Bresciani-Turroni employed theories which were already being debated during the inflation itself. Graham inclined towards the so-called “balance of payments theory”, regarding a factor external to Germany, the reparations demands made by the victorious powers, as a major cause of the external depreciation of the mark, in turn causing the internal price inflation. Bresciani-Turroni, on the other hand, favored a “quantity theory” explanation of both

¹ Frank D. Graham: *Exchange, Prices and Production in Hyper-Inflation: Germany, 1920–1923* (New York, 1930, reprinted 1967).

² Costantino Bresciani-Turroni: *The Economics of Inflation. A Study of Currency Depreciation in Post-War Germany* (London, 1937, reprinted 1968). First published in Italian, 1931. Bresciani-Turroni had eyewitness experience of the inflation and as an official of the Reparations Commission had access to unpublished sources of information.

³ Karsten Laursen und Jørgen Pedersen: *The German Inflation 1918–1923* (Amsterdam, 1964).

the internal and the external currency depreciation, and hence regarded domestic economic policy as the chief cause of the inflation.⁴ Writing after the so-called “Keynesian Revolution”, Laursen and Pedersen invoked a wages-led “cost push” hypothesis to explain the rise of prices in Germany between 1918 and 1923, and in the tradition of Keynes they cast the money supply in a rather passive, accommodating role. Both Graham and Laursen/Pedersen emphasized the positive effects of the inflation upon growth and employment, as having contributed to the social pacification of the Weimar Republic in its early stages.⁵ Bresciani-Turroni, on the other hand, stressed the distortions in the economic structure induced by the frantic “flight into real values” and the hectic investment activity of the inflation period, distortions that came fully to light only in the form of structural unemployment and the need for wide-scale rationalization after the stabilization.⁶ Laursen and Pedersen argued that the inflation not only enlarged the national income available for distribution but also, through its tendency to promote full employment, caused that income to be more equally distributed than it would have been under policies orientated towards currency stability, such as those which in other countries were precipitating the depression of 1920–1921.⁷ Against this Bresciani-Turroni maintained that the great German inflation effected a “revolution of the social classes” during which inequality actually increased. A few who knew how to concentrate the nation’s wealth in their hands benefited whilst millions were reduced to poverty.⁸

These markedly contradictory assessments of the causes and the consequences of the German inflation after the Great War reflect not only the

⁴ D.H. Robertson, the well known British monetary economist, who otherwise admired Bresciani-Turroni’s study, believed the chief weakness of its argument to lie in the fact that the author placed the responsibility for the inflation entirely on the shoulders of the German politicians. Bresciani-Turroni did not “deal as they deserve with those victorious Powers whose blind rapacity helped to impose on the leaders of the young Republic a task so manifestly beyond their strength. I for one feel... that in this single but important respect his book lacks balance.” D.H. Robertson, “C. Bresciani-Turroni: The Economics of Inflation...”, review article in *Economica*, 5 (1938), p. 234.

⁵ In his contribution, “Die Rolle der Staatsfinanzen für den Inflationsprozess”, in Deutsche Bundesbank (ed.): *Währung und Wirtschaft in Deutschland 1876–1975* (Frankfurt/M., 1976) Heinz Haller goes so far as to judge, “The survival of parliamentary democracy was, I repeat, the great positive consequence of the inflation” (p. 152).

⁶ C. Bresciani-Turroni: *Economics of Inflation*, pp. 403–404, 195ff.

⁷ K. Laursen and J. Pedersen: *German Inflation*, pp. 120–123.

⁸ C. Bresciani-Turroni: *Economics of Inflation*, p. 404. In his foreword to this book Lionel Robbins even advanced the subsequently popularized thesis: “Hitler is the foster-child of the inflation” (p. 5).

differing theoretical starting points of their authors but also the inadequate state of empirical research into the economic and social processes of the inflation period. Existing compilations of historical statistics for the German economy generally leave gaps for the years 1914–23.⁹ The historian Gerald Feldman has summarily designated the inflation “a historical desert with few oases,”¹⁰ and has called upon historical research to move beyond explanation simply in terms of economic theory towards treatment of the political causes and consequences.¹¹ The economic historian Knut Borchardt has likewise warned against treating the 1914–1923 inflation simply as a “mechanical breakdown in the capitalist economy.” “On the contrary, it is primarily a political phenomenon,” one which it is possible to judge only after taking into account “what alternative prescriptions lay to hand.”¹² Peter-Christian Witt has also urged that the purely economic manner of viewing the inflationary events of 1914–1923 be abandoned, and that the discussion of monetary policy be restored “to its proper context, that of the totality of the decision-

⁹ Cp. Walther G. Hoffmann *et al.*: *Das Wachstum der deutschen Wirtschaft seit der Mitte des 19. Jahrhunderts* (Berlin, 1965). Statistisches Bundesamt, *Bevölkerung und Wirtschaft 1872–1972* (Stuttgart, 1972), pp. 87ff.

¹⁰ Gerald D. Feldman: “Gegenwärtiger Forschungsstand und künftige Forschungsprobleme zur deutschen Inflation”, in Otto Büsch and Gerald D. Feldman (eds.): *Historische Prozesse der deutschen Inflation 1914 bis 1924. Ein Tagungsbericht* (Berlin, 1978), p. 3.

¹¹ *Ibid.*, pp. 10, 18. Feldman himself is the distinguished author of several comprehensive studies of the interplay of political forces during the inflation years. Cp. his books: *Army, Industry, and Labor in Germany, 1914–1918* (Princeton, 1966), *Iron and Steel in the German Inflation, 1916–1923* (Princeton, 1977), and, with Heidrun Homburg: *Industrie und Inflation. Studien und Dokumente zur Politik der deutschen Unternehmer 1916–1923* (Hamburg, 1977). See also the results of a five-year interdisciplinary and international research project, “Inflation and Reconstruction in Germany and Europe, 1914–1924”, initiated by G. D. Feldman, C.-L. Holtfrerich, G. A. Ritter and P.-C. Witt and financed by the Stiftung Volkswagenwerk, Hannover, from 1978 to 1983. G. D. Feldman, C.-L. Holtfrerich, G. A. Ritter and P.-C. Witt (eds.): *The German Inflation Reconsidered. A Preliminary Balance* (Berlin, 1982), and *The Experience of Inflation. International and Comparative Studies* (Berlin, 1984). Further collections of essays and monographs with results of the research project will be forthcoming.

On the political aspects of inflation and stabilization, see the wide ranging and exhaustive study by Charles S. Maier: *Recasting Bourgeois Europe. Stabilization in France, Germany and Italy in the Decade after World War I* (Princeton, 1975). The following study also deals with the political dimension, but molds it into a crude conspiracy theory: Agnete von Specht, *Politische und wirtschaftliche Hintergründe der deutschen Inflation 1918–1923* (Frankfurt/M., 1982).

¹² Knut Borchardt: “Die Erfahrung mit Inflationen in Deutschland”, in J. Schlemmer (ed.): *Enteignung durch Inflation? Fragen der Geldwertstabilität* (Munich, 1972), p. 17. The political dimension of inflation, especially the political representation of economic interests, has recently attracted increasing attention from economists. Cp. the collection of essays in Fred Hirsch and John H. Goldthorpe (eds.): *The Political Economy of Inflation* (London, 1978).

making process in the realm of financial politics,” in order that the underlying political decisions may be adequately analyzed.¹³

Objectives of the Present Study

The aims of the present work may be deduced from the above. It is intended as a contribution towards filling out the inadequate historiographical picture of the German inflation in certain specialist areas. But it is not simply intended as this: in addition to the specialist research it aims to provide a more general overview of the actual phenomenon of the inflation, its causes and its consequences. Taking into account the criticisms of the existing standard works that have been discussed above, and the more recently formulated research desiderata, I have considered it especially important to place emphasis on four areas: firstly, to incorporate consideration of the war years in which the inflationary financial policy had its origin; secondly, to move beyond narrowly economic explanations of the inflationary developments and take into account the foreign and domestic political factors which helped to shape the economic changes; thirdly, to make some contribution toward closing the gaps in our statistical knowledge of the German inflation; and fourthly and not least, to examine the inflationary developments in Germany in their international context and from a comparative international perspective.

Consideration of the international ‘dimension’ is essential for the very reason that monetary and related economic developments within Germany did not occur in isolation from the world outside. Because Germany was one of the world’s major industrial economies, the effects of her inflationary policies were felt abroad, and influenced the path taken by the world economy. Conversely, political decisions and the course of economic events abroad affected the course of economic (and political) change in Germany; at the very least they helped to place limits upon the range of feasible options open to German economic policy. Other countries’ policies towards Germany on the reparations issue, foreign trade and foreign lending provide clear examples of this. But even the more specifically internal decisions of major foreign states, as they sought to implement monetary and fiscal policy and control the domestic

¹³ Peter-Christian Witt: “Finanzpolitik und sozialer Wandel in Krieg und Inflation 1918–1924”, in H. Mommsen, D. Petzina, B. Weisbrod (eds.): *Industrielles System und politische Entwicklung in der Weimarer Republik* (Düsseldorf, 1974), p. 397.

trade cycle, also had repercussions on the economic parameters of the course of events within Germany.

Furthermore, there are logical grounds for asserting that international comparisons form an indispensable part of this study. Such comparisons serve as a means of separating out from the mass of causal relationships which, even in the economic sphere alone, weave in and out of the historical process, those factors and those effects which are to be related specifically to the inflation itself. Many of the economic, social and political problems that surfaced in the postwar world were common to countries undergoing quite different currency experiences: such similarities can even be discerned between polar cases, such as Britain, where deflation ruled after 1919, and Germany, with her inflation. Problems of reconstruction and reconversion of the economy from wartime to peacetime production emerged after the Armistice in every country which had been directly or indirectly involved in the war economy, and policies with a variety of implications for currency stability were employed to solve them. Franz Eulenburg, in his pioneer study of the social effects of the inflation, warned long ago of the danger of constructing "complex chains of causal connections which trace every alteration of the social structure back to the single factor" of the currency and its manipulation. The question should rather be "How much of the final outcome is to be attributed to the currency alone and how much to the other causes?"¹⁴ Eulenburg was skeptical of the value of international comparison as a means of solving this problem, however, "since conditions generally differ so much, as for example, between Britain and Germany."¹⁵ However, it seems to me that international comparisons (along with intertemporal ones) offer the only practical method of avoiding sheer arbitrariness in identifying the causes and effects of the inflation. It goes without saying that in dealing with so multifaceted a historical process as inflation it is not always possible to proceed in a strictly systematic fashion, still less to confine oneself to the tools of econometric analysis. Instead when developments abroad offer interesting and relevant contrasts with or parallels to developments in Germany, they will be drawn on illustratively and descriptively as a means of elucidating the German developments and of confirming the explanation offered for them. This seems the best course of action, the more so since a systematic comparison of the inflationary developments following the First World War already exists in the outstanding League

¹⁴ Franz Eulenburg: "Die sozialen Wirkungen der Währungsverhältnisse", in *Jahrbücher für Nationalökonomie und Statistik*, 122 (1924), p. 749.

¹⁵ *Ibid.*

of Nations study by Ragnar Nurkse,¹⁶ and we possess Phillip Cagan's econometric comparison of the experience of hyperinflation in seven twentieth century economies.¹⁷

The investigation that follows is arranged in three parts. Part One offers a statistical account of the German inflation. Following today's definition of inflation, it charts the process of continuously rising prices, and of the currency's persistent loss of external and internal purchasing power; it also charts the process of monetary expansion itself – which was more central to the original and contemporary usage of the word.¹⁸ This part of the book is dominated by discussion of the statistical problems encountered in measuring inflationary phenomena, and will be of interest mainly to economists. Readers who are more interested in the inflation's political aspects and its consequences may safely commence their reading with Part Two.

The subject of this second part is the causation of the inflation. It deals with the economic factors which initiated, influenced and constrained the history of inflation; behind these with the underlying political determinants. In particular it examines the financial policies of the Reich during and after the war, and the effect of the Reparations problem on the rate of inflation; it investigates the credit policies of the Reichsbank and the political constraints under which that institution acted. It explores the constraints upon real supply which contributed from that side to the "inflationary gap" on the goods market and lastly it deals with the problem of "confidence in the currency" – i.e. in the stability of its future purchasing power – and the impact of this politically sensitive variable upon short run variations in the course of inflation.

Part Three deals with the effects of the inflation – especially on growth and employment and hence, on the size and the distribution of national income. It also examines the way in which the German inflation stimulated economic activity in other countries, particularly during the world slump of 1920–21, and shows that the postwar inflation effected a redistribution of wealth from the rest of the world to Germany on a scale scarcely less than that associated with the German capital imports of the second half of the 1920s: this inter-

¹⁶ Ragnar Nurkse: *The Course and Control of Inflation. A Review of Monetary Experience in Europe after World War I* (Geneva, 1946).

¹⁷ Phillip Cagan: "The Monetary Dynamics of Hyperinflation", in M. Friedman (ed.): *Studies in the Quantity Theory of Money* (Chicago, 1956), pp. 25–117.

¹⁸ On the evolving connotations of the word compare Kurt Singer: "Inflation", in the *Handwörterbuch der Staatswissenschaften*, vol. 5 (Jena, 1923), pp. 444–445; also Friedrich Bendixen: *Das Inflationsproblem* (Stuttgart, 1917), pp. 11–13, and Fritz Neumark: *Begriff und Wesen der Inflation* (Jena, 1922), pp. 11 ff.

national redistributive effect is critical to any overall assessment of the inflationary process.

The book ends with a survey of the ultimately inevitable stabilization measures and of the revaluation legislation which attempted to correct retrospectively some distributional consequences of the inflation.

In this work I have sought to avoid one-sided theoretical interpretations, and to take into account in my discussion as broad a spectrum as possible of causes and consequences. The reader is thus given the opportunity of picking out and evaluating those causes and consequences which seem of most importance to him, as judged by his particular scale of preferences. Ultimately, judgments about the desirability or otherwise of the various effects of the inflation are value judgments, and have in turn implications for the reader's assessment of the various theoretical accounts of the inflation's causes. If for example the short run effects of inflation on growth and employment score high in his scale of values, so high as to outweigh the perhaps negatively assessed allocative or distributional effects, then he is likely to prefer theoretical interpretations such as Laursen and Pedersen's. On the one hand, they emphasize the beneficial effects of the inflationary process. On the other hand, they see this process rather as the outcome of the conjuncture of circumstances than as the product of an evil intention, rather as the result of "a lack of policy" than of deliberate strategy.¹⁹ This viewpoint obviously serves to excuse the contemporary policy makers for the less favored effects of inflation.

Those, in contrast, who judge the inflation to have been an avoidable evil will then have to relate the costs of combating it to the benefits of stabilization, and this too involves them in value judgments. This class of reader will tend to prefer theoretical interpretations in which the cost appears tolerable relative to the benefit. Suppose for example that there is theoretical support both for the proposition that inflation can be combated by measures to improve the balance of payments (e. g. mobilizing long-term foreign loans) and for the proposition that it can be combated by reductions in public expenditure; suppose further that the costs of the former measures are thought tolerable in relation to the benefits of stabilization, but the social implications of the latter are thought too high a price to pay: – then such readers will naturally be drawn, following Graham, to the 'balance of payments' theory of the inflation. Strict 'quantity theory' interpretations such as Bresciani-Turroni's will, lastly, be preferred by those in whose eyes the social benefits outweigh the social costs of stabilization through cuts in the budget, even considering the precarious internal and external political conditions that followed the First World War.

¹⁹ K. Laursen and J. Pedersen: *German Inflation*, p. 123.

That this was evidently the value judgment of those responsible for Great Britain's financial and monetary policy after the war is revealed by her early decision in favor of deflation; not without cause has the quantity theory sometimes been designated the "English" theory.²⁰

Thus inflation can be viewed as the final "output" of a political, social and economic "production process", and, like the production volume of a manufacturing plant, as the result of a variety of "inputs". The determination of the rate of inflation is then analogous to the problem of controlling the rate at which a machine produces. Different methods of control are possible – for example varying the power supply, or – with the power supply unchanged – merely adjusting the rate of feed from the previous stage of production. While both methods achieve the same ends, the decision between them will depend on the costs associated with each. But – to return to the inflation – since in the sphere of social relations there exists no objective measure of cost and benefit, the process of deciding between theories of inflation and their associated policy prescriptions can never be simply one of checking their formal adequacy, logical consistency and empirical relevance; subjective valuations must inevitably play a large part as well.

²⁰ C. Bresciani-Turroni: *Economics of Inflation*, p. 46.

Part One

Statistical Measures and their Problems

Chapter 1

Classifying Inflations

Inflations may be classified by the causes ascribed to them, and designated for example, “cost push”, “demand pull” or “imported” inflation.¹ Alternatively they may be classified by the form they take, and described as “open” or “suppressed”. Whether “open” or “suppressed”, all major inflations necessarily imply the existence of excess demand on the goods market: other names for this are an “inflationary gap” or “goods gap”. The dynamics producing this gap always arise in practice from the demand side. Theoretically the gap could originate from the supply side – through, for example, the disturbing effects of war on real output. But the necessary supply-side precondition for continuously rising prices (assuming aggregate monetary demand to be constant) would be the continuous contraction of production, and although wars do precipitate large discrete reductions in output these do not in practice become cumulative. Thus in all cases of historical significance inflation has been associated with an increase of aggregate demand at current prices that outstrips the growth of aggregate real supply and is related to a continuous expansion of the money supply. This is what the word “inflation” originally signified: a “blowing out” of the money supply and of aggregate monetary demand.

What distinguishes an *open* inflation, in empirical terms, is the evidence of prices rising continuously over a considerable period.² In such a case the rising

¹ A convenient classification is provided by Otmar Issing: *Einführung in die Geldtheorie* (Munich, 3rd edn. 1977). Amongst English introductions to the theory of inflation are: John S. Fleming: *Inflation* (Oxford, 1976), and James A. Trevithick and Charles Mulvey: *The Economics of Inflation* (London, 1975).

² Artur Woll: *Allgemeine Volkswirtschaftslehre* (Munich, 5th edn. 1976), p. 369. Some writers include so-called “profit inflation” (or, “relative inflation”) in the “open” inflation category, even though under certain circumstances this may be associated with price stability: for example, other things being equal, when the rate of wage increase is less than the rate of productivity increase. In this case the trend followed by costs diverges from that followed by selling prices, to the benefit of profit margins. Cp. Herbert Giersch: “Inflation: Die ‘Gewinninflation’”, *Handwörterbuch der Sozialwissenschaften* (Stuttgart, 13 vol. 1956–1968), vol. 5 (1956), p. 282. In the interests of clarity I leave such cases, which cannot be ascribed to a widening gap between monetary demand and real supply, out of consideration. Short term cyclical increases in the price level, insofar as they are counterbalanced in the short or medium term by corresponding falls in the price level, are likewise not regarded as inflationary phenomena.

prices will of themselves tend to close the inflationary gap. On the one hand they will tend to absorb the excess demand and on the other to attract additional supplies on to the market. However the power of this tendency will be contingent upon the state of market expectations about future price change. If the transactors on the goods market expect a fall in the price level, or even just a deceleration in the rate of price increase, the tendency just described will operate so much the more powerfully: moderate price rises and moderate increases in real supply will prove sufficient to close the "goods gap". But if the market expects the upwards price "push" to accelerate, then the initial price rise will trigger off still greater increases in monetary demand ("flight into real values") and still greater contraction of the real supply reaching the goods market. Excess demand and the inflationary dynamic will intensify.

Under "open" inflation the measurement of changes in the price level is obviously of central significance, and a variety of indicators has been used to do this, depending on the precise purpose of the investigation. Among these are the implicit GNP deflator, the wholesale and retail price indexes. The external parity of the currency, too, has frequently been employed as a measure not only of the currency's international but also of its domestic purchasing power.³ Today the cost-of-living index would usually be considered the most appropriate index⁴ because the achievement of long term cost-of-living stability has become a principal aim of present day economic policy (the whole population being consumers, instability in the cost of living affects everybody). Once the rate of price change has been measured, 'open' inflations can be classified more finely according to their severity: creeping inflation (up to 10 % p.a.), "cantering" (10 %–50 % p.a.), galloping (above 50 % p.a.) and hyperinflation (above 50 % per month).

When the state intervenes to exert direct influence on prices which were previously determined freely by market forces, we are dealing with "suppressed" inflation. The state may do this for example to prevent shortages of basic foodstuffs from causing their prices to rise; however the same principle is at work when private sector monopolists do not raise prices unless they can refer to increased production costs or parallel cost-of-living rises as public justification for their action.⁵ What distinguishes "suppressed" inflation is the

³ Especially in cases where other indicators are not available as for example in the bullion controversy in early 19th century England. Cp. Frank W. Fetter: *The Development of British Monetary Orthodoxy 1797–1875* (Cambridge, Mass. 1965), pp. 27–28.

⁴ On the history of the definition and method of measuring inflation, see Harald Scherf: "Inflation", *Handwörterbuch der Wirtschaftswissenschaften* (Stuttgart, 10 vols. 1977–83), vol. 4 (1978), p. 159.

⁵ H. Giersch: "Inflation", p. 285. Behavior of this sort was displayed to some extent by iron and

existence of “official” prices which are below market-clearing equilibrium prices. The consequence is a “goods gap” which suppliers experience as lengthening order books, abnormal delivery delays, queues and vanishing stocks of saleable finished goods, and which buyers experience as unintended accumulation of monetary assets. This accumulation of monetary assets is sometimes referred to as the “monetary overhang” and is observable in the increased ratio of cash balances to income – in other words as a reduction in the velocity of circulation.⁶ “Suppressed inflation” is the same thing as “cash balance inflation” and may be present even when no price increases are observable. This may be illustrated by a simple application of Irving Fisher’s so-called “equation of exchange”:

$$M \cdot \frac{1}{k} = Y_r \cdot P \quad \text{where } \frac{1}{k} = V$$

M = the stock of money; V = the income velocity of circulation; k = the observed proportion between cash balances and money national income; Y_r = real national income; P = the price level.

Expressing this in terms of rates of change, we have:

$$\dot{M} - \dot{k} = \dot{Y}_r + \dot{P}$$

where the dot over the variable denotes rate of change.

In this notation pure price inflation is present where

$$\dot{k} = 0; \quad \text{and hence} \quad \dot{P} = \dot{M} - \dot{Y}_r > 0$$

Pure cash balance inflation is present where

$$\dot{P} = 0; \quad \text{and hence} \quad \dot{k} = \dot{M} - \dot{Y}_r > 0$$

and finally mixed price and cash balance inflation is present where

$$\dot{P}, \dot{k} > 0$$

Suppressed inflation usually originates with the imposition of maximum prices. In the early stages these do not need to be reinforced by controls of the sales volumes (e. g. rationing or the enforcement of quotas). However once

steel industrialists during 1919/20. Cp. Gerald D. Feldman: *Iron and Steel in the German Inflation 1916–23* (Princeton, 1977), pp. 88 ff.

⁶ H. Jörg Thieme: “Inflation in westlichen Marktwirtschaften und östlichen Planwirtschaften”, *List Forum*, 9 (1977/78), p. 293.

the “goods gap” has widened to the extent that the demand for commodities can no longer be satisfied, even by substitute products, and monetary overhang in buyers’ hands has reached such proportions that they seek all means to reduce it, quantitative controls on demand become unavoidable. A variety of systems – for example the distribution of ration cards to consumers or the assigning of consumers to specific retailers – are used to displace the price system as the allocative mechanism in the goods market. Money remains the formal unit of account, but loses much of its function as a means of exchange. As administrative controls intensify in particular markets, and as the spread of supply scarcities causes an increasing number of previously uncontrolled markets to be brought within their orbit, the “market economy” itself becomes transformed into a “centrally administered economy”. This transformation is not without cost. Incentives become distorted and this distorts the structure of production; producers are induced to skim the quality of controlled goods and services and to work the more basic commodities up into luxuries which may be sold on the remaining uncontrolled markets. Hoarding increases. Bottlenecks in production and distribution are reflected in the mushrooming of queues. A costly administrative apparatus develops to manage and police the system. The emergence of black markets (illegal money transactions in controlled goods) and grey markets (illegal barter of controlled goods) signalizes the onset of advanced stages of suppressed inflation.

Whereas, then, a continuously rising price level is evidence of an “open” inflation, a “suppressed” inflation may be detected from the behavior of the following variables.

1. The length of delivery periods.
2. The relationship between the price of controlled and uncontrolled commodities.
3. The relationship between official and black market prices for controlled commodities.
4. The level and rate of increase of savings deposits – both absolutely and in relation to other variables such as retail turnover.
5. Change in the velocity of circulation of money, as evidence of “monetary overhang”.

Chapter 2

Price and Purchasing Power Movements

2.1. Exchange Rates and Wholesale Prices

When contemporaries sought evidence about the rate of price inflation the indicators they chiefly relied on were those pertaining to movements of the external exchange rate and of wholesale and retail prices. The first obviously measured changes in the mark's international purchasing power, the second and third measured changes in its domestic purchasing power. Retail price statistics had been relatively undeveloped in Germany before the First World War.¹ With the coming of war and inflation however, and the increasing institutionalization of wage bargaining, demands increased from employers and workers alike for reliable measures of the purchasing power of the working-class household, to be used as a basis for negotiating collective wage agreements. This forced government statistical offices to improve the retail price statistics they could supply, with the result that the inflation period became formative in the development of German cost-of-living statistics. Because of its importance this development is discussed separately in section 2.2.

Movements in wholesale prices had been investigated by the Imperial Statistical Office (after 1918, Reich Statistical Office) since 1879; but all that had been done was to record and publish separately the prices of about forty commodities.² This primitive approach was only beginning to be improved by the end of our period: a proper weighting scheme was officially adopted in 1921 (and used to recalculate the pre-1921 values retrospectively). Not until after 1923 however was the range of commodities used for compiling the index enlarged to conform to present-day standards.³ The wholesale price index reacted more sharply than the indexes of retail prices to changes in market conditions – especially after the end of the war. This was because the prices entering the retail indexes – particularly foodstuffs prices – were still strictly controlled, whereas at the wholesale stage prices were freer. In ad-

¹ Cp. Statistisches Bundesamt: *Bevölkerung und Wirtschaft*..., p. 28.

² *Ibid.*

³ 400 commodities in 1926; in subsequent years up to 1000.

dition, domestic wholesale prices were also more sensitive than retail prices to change in world market conditions.

However the most sensitive index of changes – actual and anticipated – in a currency's purchasing power is its price in the foreign currency markets. This index reflects primarily changes in international purchasing power and operates provided that exchange rates are flexible and subject to only limited official intervention. This was largely true of the mark and other leading currencies in the early postwar years. Today it is customary to use a trade-weighted index of foreign currency quotations, as expressed in the domestic currency, to measure the domestic currency's changing international value. In the period we are considering the international depreciation of the mark was measured simply by its dollar exchange rate. There are a number of reasons why in those days the dollar rate was the accepted yardstick of movements of floating currencies. The dollar had been more continuously on the gold standard than any other currency, convertibility having been suspended only for the brief period when the U. S. A. was actually at war (1917–1919). Moreover the U. S. A. had emerged from the war as the world's predominant power economically and financially, and international currency reserves were increasingly held in dollars rather than in sterling.⁴

Table 1 compares the monthly movements of the German wholesale price index with those of the dollar rate on the Berlin foreign exchange market over the entire period 1914–1923. Both are expressed to base 1913 = 1. A striking feature of the comparison during the war years is the way in which the rise in the dollar rate lagged behind the rise in the wholesale price index. In this the effects of exchange controls on international transactions may be seen: the purpose of these controls was to prevent a visible decline in the international value of the mark.⁵

This exchange control policy reflected real economic priorities. The problem during the war years was not primarily one of gaining overseas markets; the state's insatiable demands for war matériel eliminated all "overproduction" problems. Rather it was one of securing the imports essential to the war effort at the best (i. e. lowest) possible prices. Priorities changed after the war

⁴ William Adams Brown: *The International Gold Standard Reinterpreted 1914–34* (New York, 2 vols. 1940), vol. 1, pp. 146 ff.

⁵ Robert Liefmann: *Die Geldvermehrung im Weltkriege und die Beseitigung ihrer Folgen* (Berlin, 1918), esp. chapter 7, "Die Regelung des Devisen- und ausländischen Effektenverkehrs im Weltkriege", pp. 123–139. H. Kleine-Natrop: *Devisenpolitik in Deutschland vor dem Kriege und in der Kriegs- und Nachkriegszeit* (Berlin, 1922), pp. 12 ff. Recently, R. Kühne: *Die Devisenzwangswirtschaft im Deutschen Reich während der Jahre 1916 bis 1926. Eine währungspolitische Reminiszenz* (Frankfurt/M., 1970).

Table 1. Comparative movements of the German wholesale price index and the dollar/mark exchange rate 1914–23 (1913 = 1) (E = exchange rate index; W = wholesale price index)

Month	1914 E	W	1915 E	W	1916 E	W	1917 E	W	1918 E	W
January	1.002	0.96	1.10	1.26	1.27	1.50	1.38	1.56	1.24	2.04
February	1.001	0.96	1.12	1.33	1.28	1.51	1.40	1.58	1.26	1.98
March	1.000	0.96	1.15	1.39	1.32	1.48	1.39	1.59	1.24	1.98
April	0.999	0.95	1.16	1.42	1.30	1.49	1.54	1.63	1.22	2.04
May	0.999	0.97	1.15	1.39	1.24	1.51	1.56	1.63	1.22	2.03
June	0.998	0.99	1.16	1.39	1.26	1.52	1.69	1.65	1.28	2.09
July	0.999	0.99	1.17	1.50	1.31	1.61	1.70	1.72	1.38	2.08
August	0.998	1.09	1.17	1.46	1.33	1.59	1.70	2.03	1.45	2.35
September	0.997	1.11	1.16	1.45	1.37	1.54	1.72	1.99	1.57	2.30
October	1.043	1.18	1.16	1.47	1.36	1.53	1.74	2.01	1.57	2.34
November	1.097	1.23	1.18	1.47	1.38	1.51	1.65	2.03	1.77	2.34
December	1.072	1.25	1.23	1.48	1.36	1.51	1.35	2.03	1.97	2.45
Annual Average	1.017	1.05	1.16	1.42	1.32	1.52	1.57	1.79	1.43	2.17

Month	1919 E	W	1920 E	W	1921 E	W	1922 E	W	1923 E	W
January	1.95	2.62	15.43	12.56	15.46	14.39	45.69	36.65	4281	2783
February	2.17	2.70	23.60	16.85	14.60	13.76	49.51	41.03	6650	5585
March	2.48	2.74	19.97	17.09	14.87	13.38	67.70	54.33	5048	4888
April	3.00	2.86	14.20	15.67	15.13	13.26	69.32	63.55	5826	5212
May	3.06	2.97	11.07	15.08	14.83	13.08	69.11	64.58	11355	8170
June	3.34	3.08	9.32	13.82	16.51	13.66	75.62	70.30	26202	19385
July	3.59	3.39	9.40	13.67	18.26	14.28	117.49	100.59	84186	74787
August	4.48	4.22	11.37	14.50	20.07	19.17	270.26	192.0	1100632	944041
September	5.73	4.93	13.81	14.98	24.98	20.67	349.18	287.0	in mill. 23.5	in mill. 23.9
October	6.39	5.62	16.23	14.66	35.76	24.60	757.73	566.0	in bn. 6.0	in bn. 7.1
November	9.12	6.78	18.39	15.09	62.64	34.16	1711.08	1154	522	725.7
December	11.14	8.03	17.38	14.40	45.72	34.87	1807.83	1475	1000	1261.6
Annual Average	4.70	4.15	15.01	14.86	24.91	19.11	449.21	341.82		

Source: Statistisches Reichsamt: *Zahlen zur Geldentwertung in Deutschland 1914 bis 1923* (Berlin, 1925), pp. 6, 16, 17.

was over. Domestic productive capacity could now be fully utilized only if more could be sold abroad; the securing of imports on the other hand became both less difficult and less costly once the allied blockade had been lifted in the summer of 1919 and the world economy had begun to slide into recession in 1920. These altered priorities were, not surprisingly, reflected in the relaxation of exchange controls: the centralized handling of all foreign currency transactions at the Reichsbank – required by the Foreign Exchange Decree of early 1917 – was suspended on September 11, 1919.⁶ The official justification for the suspension of controls was that the so-called “hole in the west” (i.e. the unsupervised borders between France and Germany resulting from the cession of Alsace-Lorraine and the occupation of parts of western Germany) rendered them unworkable. The real grounds of the suspension are rather to be deduced from the statement of H. Kleine-Natrop when he wrote “Underlying German currency policy [sc. ‘after the war’] was one basic and enduring principle, that as far as it lay in our power, circumstances and events were to be manipulated in the economic interests of our country.”⁷ Kleine-Natrop was a Reichsbank civil servant and so must have had inside knowledge of the matter.

After the lifting of currency controls the wartime relationship between exchange rates and wholesale price movements became reversed (see Table 1). Domestic forces – chiefly the financing of the budget deficits – continued to fuel inflation, but now the rise in the dollar rate outstripped the rise in the domestic wholesale price index.⁸ Most of the commodities whose prices were used to calculate the wholesale price index were internationally tradable. It is tempting therefore to deduce changes in Germany’s international competitiveness directly from the relative rates of change of this index and of the dollar rate (e.g. a more rapid rise in the former than the latter signifying a deterioration in competitiveness). This however is too simple. International competitiveness is strictly speaking a function not of prices as such but of unit costs: hence changes in competitiveness are the result of differential changes in productivity and other elements in cost. Even ignoring this refinement however two points must be considered.

Firstly, in making a simple bilateral comparison of German and U.S. competitiveness the movement of U.S. wholesale prices must also be taken into

⁶ H. Kleine-Natrop: *Devisenpolitik*... p. 27.

⁷ *Ibid.* On the regulation of German foreign trade see Günther Haberland: *Elf Jahre staatlicher Regelung der Ein- und Ausfuhr. Eine systematische Darstellung der deutschen Außenhandelsregelung in den Jahren 1914–1925* (Leipzig, 1927).

⁸ With the exception of a few months in mid-1920, when the world recession was starting abroad.

account. The gold convertibility of the dollar signified only the constancy of the dollar's power to purchase gold, not of its power to purchase commodities in general. Wholesale prices had also risen in the U. S. A. between 1913 and 1920 – even if not as rapidly as in Germany⁹ – and despite a decline thereafter, they remained above the 1913 level. Thus a simple comparison of the rates of increase of the dollar/mark exchange rate and the German wholesale price index understates the improvement of German competitiveness vis-à-vis the U. S. economy. This point is depicted in Diagram 1.

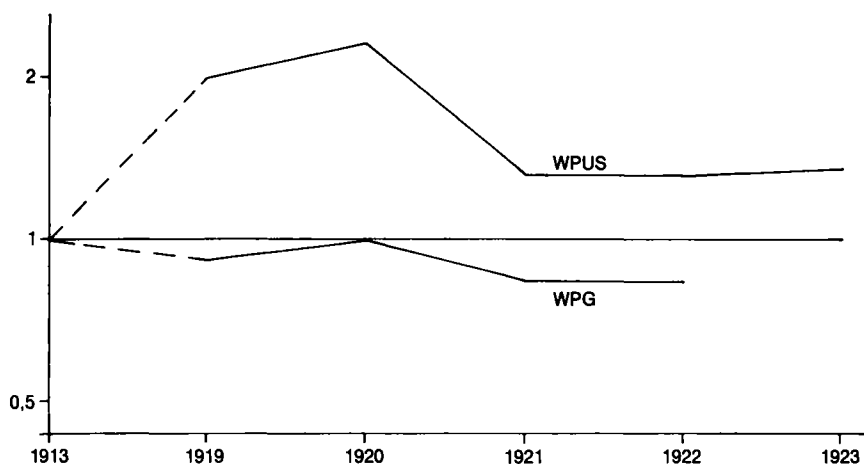


Diagram 1. Movements of German (WPG) and United States (WPUS) wholesale prices in U.S. dollars 1913–23 (Annual averages, 1913 = 1, semi-logarithmic scale)

Source: WPG Table 1; WPUS Ben J. Wattenberg: *Statistical History...*, p. 200.

In this diagram the “WPG” line represents the German wholesale price level expressed in dollars and to base 1913 = 1. It was obtained by dividing the official German wholesale price index by the current mark/dollar exchange rate after both had been converted to base 1913 = 1 (as in Table 1). From the diagram we can see that throughout the postwar inflation period the dollar equivalent of the German wholesale price index remained below its 1913 level. However the true change in German competitiveness vis-à-vis the U. S. economy is more accurately measured by comparing the “WPG” line with the change in the United States’ own wholesale price level since 1913 (the

⁹ Ben J. Wattenberg: *The Statistical History of the United States. From Colonial Times to the Present* (New York, 1976), p. 200.

“WPUS” line); the vertical distance between the two representing Germany’s competitive advantage relative to 1913.

Secondly, movements of the mark’s exchange rate against the dollar are not representative of movements of its international value against all currencies. In particular its movements against other European inconvertible currencies were quite different. Diagram 2 shows the exchange rates of various currencies against the dollar. Throughout the 1919–22 period the mark/dollar exchange rate showed greater short term variability than the others;¹⁰ nevertheless up to the middle of 1921 it followed a trend similar to the rest – even to the sterling/dollar rate. From then on – really, from the London Ultimatum of May 1921 – the trend of the mark/dollar exchange rate became sharply differentiated from the trends of other currencies’ dollar rates. Up to this date the exchange movements of the mark had been shaped by the problems of coping with postwar reconstruction common to all the belligerents, whereas after May 1921 the politics of Reparations came to dominate German currency movements, causing them to follow a distinctive path.

The greater part of Germany’s trade was with Europe. Since the depreciation of the mark against other European currencies was smaller than against the dollar, it follows that a trade-weighted index of the mark’s international value against a “basket” of currencies will show a smaller depreciation than the simple dollar exchange rate. Such a trade-weighted index is shown in the first two columns of Table 2. The weights for combining the separate mark exchange rates against individual currencies into the index were the aggregated imports originating from, plus exports destined for, the corresponding country, expressed as a percentage of total German commodity imports plus exports, using in all cases the averages of the values for the two years 1920 and 1923. Exchange rates against the fourteen currencies possessing weights, thus calculated, in excess of 1 % were included in the basket, one version of which also included the dollar rate.¹¹ Following the method currently used by the Deutsche Bundesbank¹² I used the geometric mean to calculate my trade-

¹⁰ Convenient and comprehensive tabulations of the exchange rates of all major currencies against the dollar are to be found in: Board of Governors of the Federal Reserve System: *Banking and Monetary Statistics* (Washington, D.C., 1943), pp. 662–82; also in John P. Young: *European Currency and Finance* (Washington, D.C., 1925).

¹¹ The shares came out as follows (in percentages); Hungary 1.000, Spain 1.545, Norway 2.120, Belgium 2.365, Austria 2.950, Italy 3.220, Sweden 3.550, Denmark 3.730, Poland 3.855, Czechoslovakia 3.950, Switzerland 4.530, France 5.250, Netherlands 9.950, Great Britain 10.110, U. S. A. 19.130. These added up to 77.2 % of German external trade (58.1 % excl. the U. S. A.).

¹² “Zur Berechnung des gewogenen Außenwerts der D-Mark”, *Monatsberichte der Deutschen Bundesbank*, vol. 31, no. 4 (April 1979), pp. 22–25.

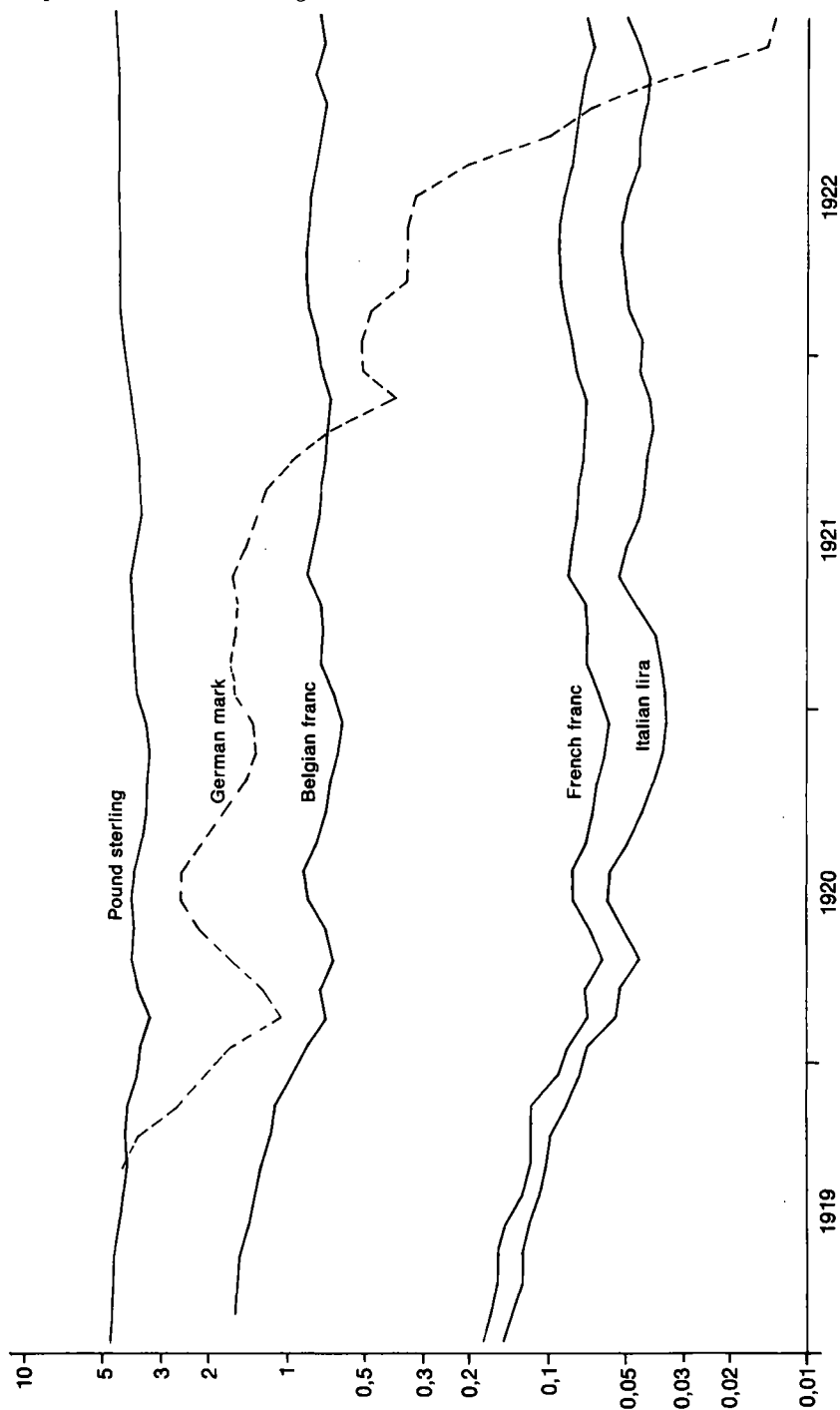


Diagram 2. Movements of average monthly prices of selected European currencies in U.S. dollars 1919-22 (semi-logarithmic scale)
 Source: Board of Governors...: *Banking and Monetary Statistics* (Washington, D.C., 1943), pp. 663-681.

weighted index, having first reduced the prices of the several foreign currencies in marks to individual indexes with base 1913 = 1. In symbols:

$$T = a_1^{w_1} \cdot a_2^{w_2} \cdot \dots \cdot a_n^{w_n}; \sum w_i = 1$$

where T is the required trade-weighted index, a_1 to a_n are the indexes of the mark prices of the several foreign currencies to base 1913 = 1, and w_1 to w_n are the weights expressed as a proportion of the aggregate weights of the fourteen or fifteen currencies in the "basket". The first column of Table 2 reproduces the monthly values of such an index when calculated against the fourteen European currencies only; the second column shows its value when calculated against these currencies plus the dollar.

A comparison of the movement of this trade-weighted index with the movement of the simple mark/dollar exchange rate recorded in Table 1 reveals at a glance how much more moderate the depreciation of the trade-weighted index was. In January 1920 for example the price of the U. S. dollar on the Berlin foreign exchange market was 15.4 times its 1913 price; the trade-weighted index of the mark prices of the fourteen European currencies was only 5.69 times its 1913 base, or 7.78 times when the index is expanded to include the dollar rate. The difference grew after the onset of hyperinflation in the summer of 1922: in December 1922 for example the dollar index reached 1808, the trade-weighted index excluding the dollar only 362.3, including the dollar only 539.4.

Our study of German competitiveness with abroad must now be amended to take account of this more comprehensive measure of the exchange rate. If we relate the movements of the trade-weighted index to domestic wholesale price movements we discover a converse relationship to that between the simple mark/dollar rate and domestic wholesale prices. In January 1920 for example the German wholesale price index stood at 12.6 times its 1913 level, but the trade-weighted index of exchange rates to the same base had reached only 5.69 excluding the U. S. A., 7.78 including it. In December 1922 the wholesale price index had reached 1475, the trade-weighted indexes 362.3 or 539.4 respectively.

However it would be just as erroneous to deduce a deterioration of Germany's competitiveness with abroad from this relationship as it was for contemporaries to deduce its improvement from the fact that the dollar rate rose more rapidly than domestic wholesale prices. Price developments abroad also have to be taken into account. I have therefore collected the *wholesale price indexes* for the same fourteen European countries (and the U. S.) to base 1913 = 1, and calculated their trade-weighted geometric average, both excluding and including the U. S. A., for the same period and using the same

weights and formula as for the exchange rates. From the two indexes thus derived and from the German wholesale price index I formed the ratio WPG/WPA – where WPG is the German wholesale price index and WPA is the trade-weighted index of wholesale prices abroad. If the undeflated trade-weighted index of the mark's international value is then divided by this ratio, a measure of the change in the trade-weighted real external value of the mark, relative to 1913, is obtained. This is the measure shown in the third and fourth columns of Table 2, the third excluding, the fourth including consideration of the U. S. A. It is from these measures that conclusions may be drawn about changes in Germany's international competitiveness: when the index exceeds

Table 2. Indexes of the undeflated and real trade-weighted value of the mark against foreign currencies 1920–23*. 1913 = 1

	Undeflated trade-weighted value of the mark against		Trade-weighted real value of the mark against	
	14 European currencies	14 European currencies and US dollar	14 European currencies	14 European currencies and US dollar
	1	2	3	4
1920				
J	5.69	7.28	2.24	2.36
F	7.86	10.32	2.40	2.57
M	7.05	9.12	2.18	2.29
A	5.19	6.66	1.82	1.89
M	4.10	5.25	1.49	1.56
J	3.68	4.63	1.43	1.47
J	3.63	4.60	1.46	1.50
A	3.89	5.07	1.50	1.57
S	4.40	5.84	1.68	1.76
O	4.92	6.61	1.93	2.01
N	5.15	7.06	1.98	2.06
D	4.80	6.61	1.88	1.93
1921				
J	4.45	6.06	1.68	1.70
F	4.37	5.90	1.66	1.64
M	4.51	6.06	1.70	1.68
A	4.76	6.33	1.74	1.71
M	4.79	6.34	1.73	1.69
J	4.90	6.62	1.69	1.67
J	4.98	6.87	1.65	1.67
A	5.28	7.35	1.33	1.35
S	6.19	8.74	1.49	1.52
O	8.68	12.3	1.75	1.80
N	15.4	21.8	2.26	2.31
D	12.0	16.7	1.75	1.75

Table 2. (continued)

	1	2	3	4
1922				
J	11.5	16.2	1.59	1.60
F	12.7	17.8	1.57	1.58
M	16.7	23.6	1.57	1.59
A	17.4	24.5	1.40	1.42
M	17.1	24.2	1.38	1.40
J	17.8	25.5	1.38	1.40
J	25.3	37.1	1.41	1.47
A	57.2	84.0	1.69	1.81
S	72.8	107.3	1.53	1.58
O	152.4	226.7	1.66	1.72
N	335.1	501.8	1.78	1.91
D	362.3	539.4	1.57	1.62
1923				
J	805.8	1218	1.93	2.01
F	1221	1857	1.54	1.59
M	918.1	1400	1.37	1.41
A	1054	1609	1.49	1.53
M	2014	3090	1.81	1.86
J	4389	6831	1.71	1.77
J	13470	21204	1.41	1.45
	in mill.	in mill.		
A	0.167	0.266	1.44	1.48
S	3.538	5.656	1.24	1.28
O	787	1303	1.025	1.067
	in bn.	in bn.		
N	66.0	110.1	0.915	0.936
D	119.5	202.2	1.011	1.036

* The indexes represent the prices in marks (undeflated and real) of the two 'baskets' of foreign currencies.

Sources: The data used to compute the above indexes were derived from the following sources: Shares in German foreign trade: *Statistisches Jahrbuch für das Deutsche Reich*, vol. 42 (1921/22), Berlin 1922, pp. 224-5; *ibid.*, vol. 44 (1924/5), Berlin 1925, pp. 175-6.

Exchange rates: Stat. Reichsamt: *Zahlen zur Geldentwertung...* pp. 12-15.

Wholesale prices: John P. Young: *European Currency and Finance* (Washington, D.C., 1925); International Conference of Economic Services (eds.): *International Abstracts of Economic Statistics* (London, 1934). The few unobtainable wholesale price data were inter- or extrapolated with the help of, e.g., the retail price index.

Method of calculation: cp. "Zur Berechnung des gewogenen Außenwerts der D-Mark", in *Monatsberichte der Deutschen Bundesbank*, vol. 31, no. 4 (April 1979), pp. 22-5; also the explanations in the text.

unity the German competitive position has improved by comparison with 1913, i.e. the increase in the mark price of foreign currencies exceeds the increase in the ratio of German to foreign wholesale prices. When the index is less than unity, the German competitive position is poorer than in 1913.

With this in mind we can interpret the third and fourth columns of Table 2. Our indicators show that throughout the period from January 1920 to October 1923 the German competitive position relative to abroad was uniformly more favorable than it had been before the war. The short term dynamics of this competitive relationship should also be noted. It can be seen that in periods of accelerating mark depreciation – such as the months following August 1921 or June 1922 – German competitive advantage showed an enlargement. Conversely in periods when the mark exchange rate appreciated – such as the months following February 1920 – Germany's competitive advantage diminished. The reasons for this are to be found in the laggardly adjustment of domestic price movements to changes on the foreign exchange market.

2.2. The Cost of Living

Index number problems

A variety of cost of living indexes was calculated during the inflation. Before attempting an evaluation of them some more general remarks should be made about the “index number problem” and its bearing upon the performance of cost-of-living indexes in times of rising prices.¹

Essentially the problem of an index number arises because it attempts to measure a complex statistical change by a simple ratio. On the one hand the prices of the different commodities entering the “cost of living” (to take the

¹ On the “index number problem”, cp. Paul Flaskämper: “Indexzahlen”, in *Handwörterbuch der Sozialwissenschaften* (Stuttgart, 13 vols., 1956–1968), vol. 5 (1956), pp. 191–195. More recently, Oskar Anderson: “Indexzahlen”, in *Handwörterbuch der Wirtschaftswissenschaften* (Stuttgart, 10 vols., 1977–83), vol. 4 (1978), pp. 98–108. More comprehensive and still standard works on the subject are: Gottfried Haberler: *Der Sinn der Indexzahlen* (Tübingen, 1927), and Irving Fisher: *The Making of Index Numbers. A Study of their Variety, Tests and Reliability* (Boston, 1922). See also R. G. D. Allen: *Index Numbers in Theory and Practice* (London, 1975). Specifically on the German inflation, see Costantino Bresciani-Turroni: “The Movement of Wages in Germany during the Depreciation of the Mark and after Stabilization”, *Journal of the Royal Statistical Society*, 92 (1929), pp. 374–403.

example that concerns us) do not change uniformly; on the other the proportions in which these commodities are purchased are not constant. The proportion of total household expenditure devoted to each commodity changes, both as a result of influences on the demand side, such as changes in money income and tastes, and of influences on the supply side such as changes in costs of production that affect the relative price structure. These demand and supply side influences plus the appearance of new consumer goods on the market cause the range of commodities purchased by households to change. The quality of individual commodities also changes over time so that to some extent price changes reflect quality changes.

Changes in the actual cost of living are the product of both these types of change – in the prices themselves and in the quantities of goods consumed. To isolate the effects on the cost of living of change in the former variable – prices – it is logically necessary to keep the other variable – commodity composition of consumption – constant; that is, to calculate the change in the money value of a fixed “basket of goods”. It is usually easier to ensure the “fixity” of the quantities of each commodity in the basket than of the quality of each commodity over time. The “basket” weights the changing prices of the separate commodities according to their proportionate representation within it: if the representation of goods whose prices are rising rapidly is increased relative to that of goods whose prices are not, the rate of increase of the overall index will accelerate. The composition of the “basket” is usually intended to reflect the actual pattern of consumption either at the start, or at the end, of the period to which the index refers: if the former, it is a “Laspeyres” index, if the latter a “Paasche” index. “Laspeyres” and “Paasche” indexes will yield different estimates of cost-of-living change during a given period: the difference is largely determined by what are called the “income effect” and the “substitution effect”.

To begin with the “income effect”. A general rise in real income over a given period will cause an increase in the consumption of luxury goods and services relative to the consumption of more basic commodities. If the prices of the former are rising more rapidly than the prices of the latter then (given the rise in real income) the “Paasche” index, reflecting end-of-period consumption patterns, will yield a higher estimate of the rate of cost-of-living increase than the “Laspeyres” index. If conversely the real income level and thus the relative consumption of luxury goods are falling during the period then (given the difference in price developments of luxury and basic goods) it is the “Laspeyres” index – reflecting start-of-period consumption patterns – that will yield the higher estimate.

The “substitution effect” comes into play as changes in the price structure

induce changes in the pattern of consumption over the period. As the price structure changes, the tendency is that the consumption of those goods which have become relatively cheaper (i. e. whose prices have risen more slowly than others) increases at the expense of the consumption of goods becoming relatively dearer. Thus the former goods will be more strongly represented in the "Paasche" basket of goods, the latter in the "Laspeyres", and the substitution effect will always tend to cause the "Laspeyres" estimate of price change to exceed the "Paasche" estimate.

While we have illustrated the index number problem with reference to baskets of goods reflecting start-of-period or end-of-period consumption patterns, the remarks made apply equally when indexes based on baskets reflecting the consumption pattern at any point within the period are used to estimate cost-of-living change over periods with different real income levels or price structures.

It follows from these remarks that the more abrupt the changes in real income and price structure during a period, the less precisely the actual rate of cost-of-living change can be measured and the greater the variation between the estimates of this which different indexes yield. The years 1914–23 in Germany were just such a period: war, defeat, blockade and foreign protectionism, production bottlenecks caused by strikes, state controls on the economy, and extreme inflation conspired to cause dramatic shifts both in real income² and in the price structure, so that the problems we have been discussing are seen as if through a magnifying glass. This explains the divergences between the price indexes for the period and all the difficulties encountered in trying to reach exact conclusions about real income levels – about the relationship between the prewar and the wartime/postwar real incomes of wage earners, for example.

Assuming however that real household income during and immediately after the war was lower than it had been before 1914 and that inflation and other factors effected considerable changes in the price structure, then (given the price controls on basic goods) our discussion in this section implies that cost-of-living indexes based on baskets reflecting prewar consumption patterns must yield higher estimates of the rate of the cost-of-living increase than indexes based on baskets reflecting wartime or postwar consumption patterns.

² Cp. chapter 8, pp. 221 ff. *infra*.