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China - Macroeconomic Cycles in the 1980s

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Abstract

This paper explores the links between reforms, macroeconomic management and the occurrence of macroeconomic instability in China during the last decade, drawing upon previous analytical work and also employing the "Granger causality" test. It is concluded that the cycles did not originate with the reforms; rather their characteristics were modified by structural changes in the economy. It is further argued that the incompleteness of reforms (which renders macroeconomic management difficult) had the effect of exacerbating the cycles by increasing their amplitude and frequency. Finally, results from the Granger tests suggest that broad money would be a good intermediate target for monetary policy.

JEL Classification Numbers:

C49, E32, O53, P29

1/ This paper originated as a background study for the 1990 Article IV consultation with China. The paper is thus a collaborative work which has benefitted from comments by Michael Bell, Steven Dunaway, Martin Fetherston, Linda M. Koenig, Fernando Montes-Negret and Brian Stuart. The author would also like to thank Charles Adams for clarifying issues on the statistical analysis, Natalie Hairfield for research assistance and Rosanne Heller for editorial assistance. Any views expressed here are those of the author and are not necessarily those of the International Monetary Fund.

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Summary

This paper examines the characteristics of the macroeconomic cycles in China during the last decade and explores the links between the cycles of instability and the reforms that were adopted during the period. The paper first compares macroeconomic developments before and after the adoption of market reforms and concludes that the cycles did not originate with the adoption of reforms although their characteristics may have been modified by the structural changes in the economic system.

Following a chronological description of the behavior of key macroeconomic variables during each of the three cycles in the reform period, the paper compares and analyzes the main features of the cycles, focusing on the inter-relationships between reforms, macroeconomic management, and the occurrences of instability. In particular, the paper employs the "Granger-causality" test to examine the lead-lag relationships among the key economic variables.

The paper concludes that while the macroeconomic cycles were not caused by the adoption of reforms, they were exacerbated by weaknesses in macroeconomic management linked to the incompleteness of the reform process. Financial discipline was weakened by the lack of buoyancy of the tax system, the "soft" budget constraints of enterprises, the incompleteness of price reforms, and the continued reliance on traditional instruments, such as the credit and cash plans, in implementing monetary policy. In this connection, the Granger tests show that broad money is a good leading indicator of macroeconomic cycles. This suggests that targeting broad money would be conducive to macroeconomic stability and would thereby also facilitate the implementation of reforms.

I. Introduction

Since 1978, China has experienced three episodes of macroeconomic instability. Each of these episodes was cyclical in nature and was characterized by excessive credit expansion, a sharp rise in inflation, and a deterioration in the balance of payments, followed by a tightening of financial policies and administrative controls, and a reduction in macroeconomic imbalances. The purpose of this paper is to examine the main characteristics of these cycles of instability, to explore the links between them and the reforms that were undertaken during the period, 1/ and to discuss the implications for macroeconomic management.

The rest of the paper is structured as follows. Background information on the system of macroeconomic management and on major economic developments in the pre-reform period is provided in Section 2. This is followed in Section 3 with a description of each of the three episodes of macroeconomic instability during the 1980s, focusing mainly on the behavior of major macroeconomic aggregates such as prices, industrial production, money, the fiscal balance, and the external balance. Section 4 compares and analyzes the main features of the cycles and explores the relationships between the reforms and macroeconomic management. Section 5 reports the results of some statistical tests on the causal relationships among key economic variables which played prominent roles in the macroeconomic cycles. Finally, Section 6 presents the implications of the analysis in this paper for the conduct of macroeconomic management.

II. Background - The Pre-Reform Period (1953-78)

Following the rehabilitation of the economy in 1949-52, the Chinese authorities adopted a centrally planned economy under which the state set production targets for all enterprises through a physical plan. Under this system, macroeconomic stability was maintained by administrative and planning mechanisms which ensured that prices were stable and imports were in line with the availability of foreign exchange.

Monetary policy was conducted through the credit and cash plans. 2/ The credit plan was the financial counterpart of the physical plan and was viewed as a means of providing sufficient credit to the enterprises to achieve the output targets of the plan. Hence, in practice, the formulation of the plan followed a "bottom-up" approach with the credit plan representing the sum of the total credit needs of the production units in the economy. The cash plan covered the various factors that influenced the

1/ A comprehensive description of the reforms since 1978 is contained in Blejer et al (1991) and Perkins (1988).

2/ A detailed description of monetary policy in the pre-reform period is contained in De Wulf and Goldsbrough (1986).

amount of cash in the economy which was the only freely usable source of purchasing power. However, since most prices, foreign trade, and external capital inflows were controlled under the system, an excessive creation of credit or money could have little impact on prices or the balance of payments but would result instead in the accumulation of forced savings. Consequently, except for one brief episode in the early 1960s when inflation rose to 16 percent--immediately after the failure of the Great Leap Forward (1958-59)--the pre-reform period was characterized by low inflation, and by external balance (Table 1 and Chart 1).

The price stability and external balance of the pre-reform period, however, were not attained without cost. Relative prices became increasingly distorted, productivity gains were minimal, and the economic growth rate declined to an average annual rate of 5 1/2 percent during 1971-78. ^{1/} Furthermore, there were wide swings in output during the pre-reform period resulting from the shifts in policy over whether control and planning of the economy should be centralized or decentralized. Particularly sharp breaks in the pattern of growth and development were experienced over two cycles of centralized/decentralized control marked by the Great Leap Forward and the Cultural Revolution (1966-76). In both instances, disenchantment with the rigidity and inefficiency of central planning led the authorities to engage in a massive mobilization of productive resources at the local levels in order to speed up economic development. However, following an initial burst in output, the economy fell into disarray reflecting the lack of a mechanism to coordinate local decisions, and centralized planning was reinstated. Toward the end of the 1970s, the policy debate over the optimal form of economic planning and control was still unresolved; however, by that time, a new leadership had emerged which had concluded that in order for China to modernize, fundamental changes were needed in the country's economic system.

III. Macroeconomic Cycles During the Reform Period

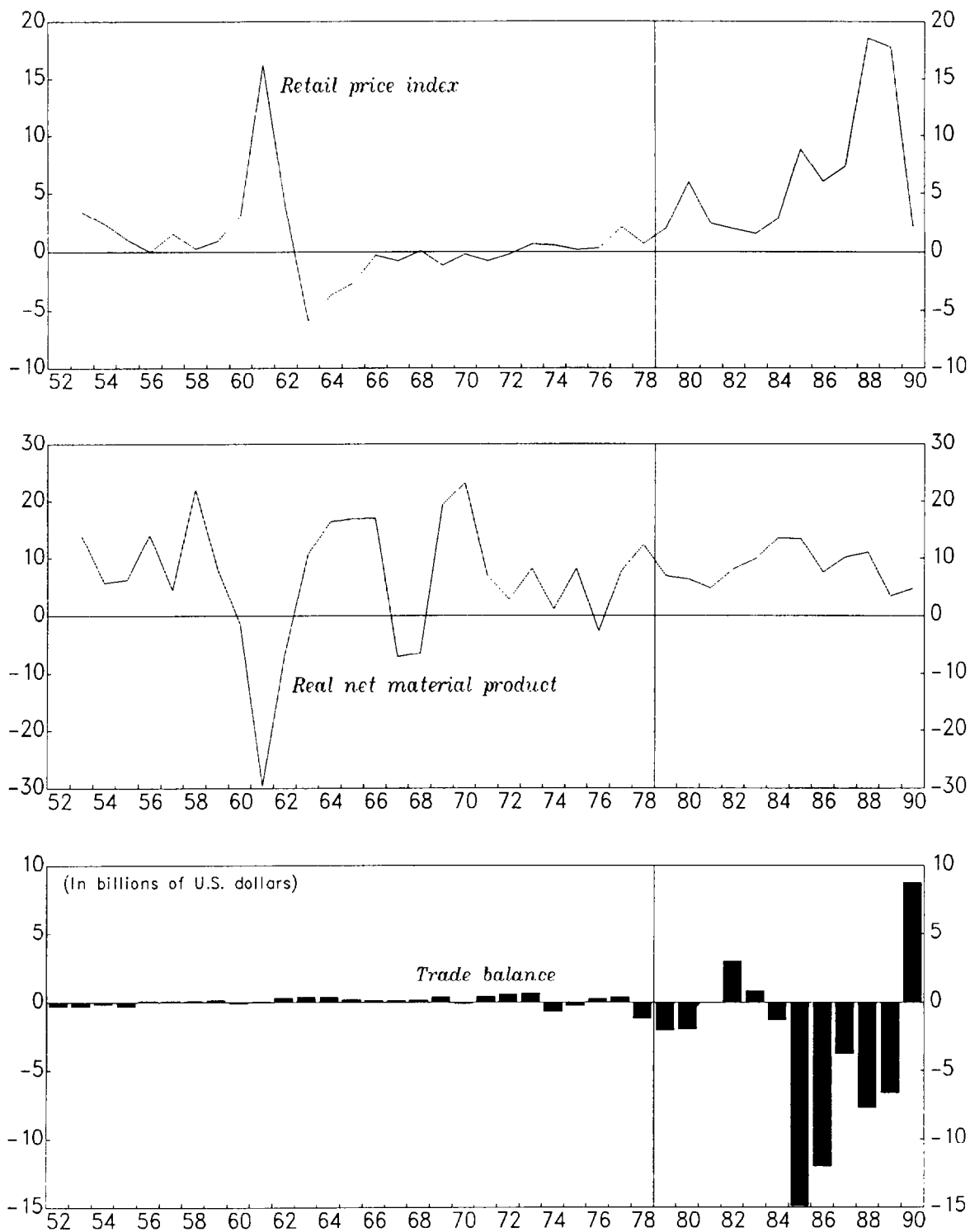
1. First cycle, 1979-82

The reform program was initiated in late 1978. ^{2/} In agriculture, the household responsibility system was introduced under which each nuclear farm family was allocated a portion of formerly collective land for a period of 15 years in exchange for certain tax and crop delivery obligations to the state. At the same time, the rural trade fairs or "free markets" were considerably freed up and major increases (20-25 percent) were made to procurement prices of agricultural products. In the urban areas, the authorities introduced the profit retention system in order to give greater autonomy to the enterprises, which were in turn expected to finance their

^{1/} GNP data are available only from 1978. For purposes of comparison with the pre-reform period, net material product data were used.

^{2/} A chronology of major economic reforms is provided in Appendix I.

CHART 1
CHINA
PRICES, OUTPUT, AND TRADE BALANCE, 1952-90
(Annual percentage change; unless indicated otherwise)



Sources: China Statistical Yearbook, 1990; and China Economic News (March 1991).

Table 1. China: Developments in Prices, Output, and Trade Balance, 1952-90

(Annual percentage change; unless otherwise indicated)

	Retail price index	Real net material product	Merchandise exports, f.o.b. <u>1/</u>	Merchandise imports, c.i.f. <u>1/</u>	Trade balance <u>1/</u>
1952	...	...	0.8	1.1	-0.3
1953	3.4	14.0	1.0	1.4	-0.3
1954	2.3	5.8	1.1	1.3	-0.1
1955	1.0	6.4	1.4	1.7	-0.3
1956	--	14.1	1.6	1.6	0.1
1957	1.5	4.5	1.6	1.5	0.1
1958	0.2	22.0	2.0	1.9	0.1
1959	0.9	8.2	2.3	2.1	0.1
1960	3.1	-1.4	1.9	2.0	-0.1
1961	16.2	-29.7	1.5	1.5	--
1962	3.8	-6.5	1.5	1.2	0.3
1963	-5.9	10.7	1.6	1.3	0.4
1964	-3.7	16.5	1.9	1.5	0.4
1965	-2.7	16.9	2.2	2.0	0.2
1966	-0.3	17.0	2.4	2.2	0.1
1967	-0.7	-7.2	2.1	2.0	0.1
1968	0.1	-6.5	2.1	2.0	0.1
1969	-1.1	19.3	2.2	1.8	0.4
1970	-0.2	23.3	2.3	2.3	-0.1
1971	-0.8	7.0	2.6	2.2	0.4
1972	-0.2	2.9	3.4	2.9	0.6
1973	0.6	8.3	5.8	5.2	0.7
1974	0.5	1.1	6.9	7.6	-0.7
1975	0.2	8.3	7.3	7.5	-0.2
1976	0.3	-2.7	6.9	6.6	0.3
1977	2.0	7.8	7.6	7.2	0.4
1978	0.7	12.3	9.8	10.9	-1.1
1979	2.0	7.0	13.7	15.7	-2.0
1980	6.0	6.4	18.1	20.0	-1.9
1981	2.4	4.9	22.0	22.0	-0.0
1982	1.9	8.2	22.3	19.3	3.0
1983	1.5	10.0	22.2	21.4	0.8
1984	2.8	13.6	26.1	27.4	-1.3
1985	8.8	13.5	27.4	42.2	-14.9
1986	6.0	7.7	30.9	42.9	-12.0
1987	7.3	10.2	39.4	43.2	-3.8
1988	18.6	11.1	47.5	55.2	-7.7
1989	17.8	3.5	52.5	59.1	-6.6
1990	2.1	4.8	62.1	53.4	8.7

Sources: China Statistical Yearbook, 1990; and China Economic News, Supplement No. 2 (March 11, 1991).

1/ In billions of U.S. dollars.

autonomy to the enterprises, which were in turn expected to finance their working capital and fixed investment from bank credits rather than budgetary grants. Public finances were also decentralized with the local governments allotted a larger share of total revenue.

These reforms led to a sharp rise in aggregate demand as farm income rose markedly and enterprises increased their outlays on investment and granted large wage increases and bonuses to their employees. At the same time, the overall budgetary balance deteriorated from a small surplus in 1978 to a deficit equivalent to 5 percent of GNP in 1979, on account of higher subsidies--the increases in agricultural producer prices which were not passed on to consumers--and the partial retention of profits by enterprises. Reflecting the deterioration in the fiscal position and increased borrowing by enterprises, credit expansion accelerated in 1979 and 1980 and the 12-month growth rates of broad money and currency exceeded 24 and 29 percent, respectively, by the end of 1980 (Table 2 and Chart 2). The strong increase in aggregate demand and accommodating credit policy led to a surge in prices and imports: the inflation rate--as measured by the 12-month change in the retail price index--rose from an average of less than 1 percent in the first three quarters of 1979 to almost 9 percent in the third quarter of 1980. The trade balance also deteriorated as strong export growth was offset by a surge in imports, which rose by 80 percent during 1979-80.

The authorities responded by tightening quantitative credit controls, increasing interest rates, and introducing the forced sale of treasury bonds, as well as by introducing more stringent vetting of investment projects. Reflecting these measures, aggregate demand, and in particular fixed investment, declined markedly in 1981 while the growth rates of broad money and currency were reduced to 20 percent and 14 percent, respectively, by the end of the year. The tightening in demand policies led to a rapid decline in inflation, which fell to less than 2 1/2 percent in 1981. The effect on the trade balance followed with a slight lag, but by the second half of 1981, the trade balance had swung into surplus reflecting a strong decline in imports.

2. Second cycle, 1984-86

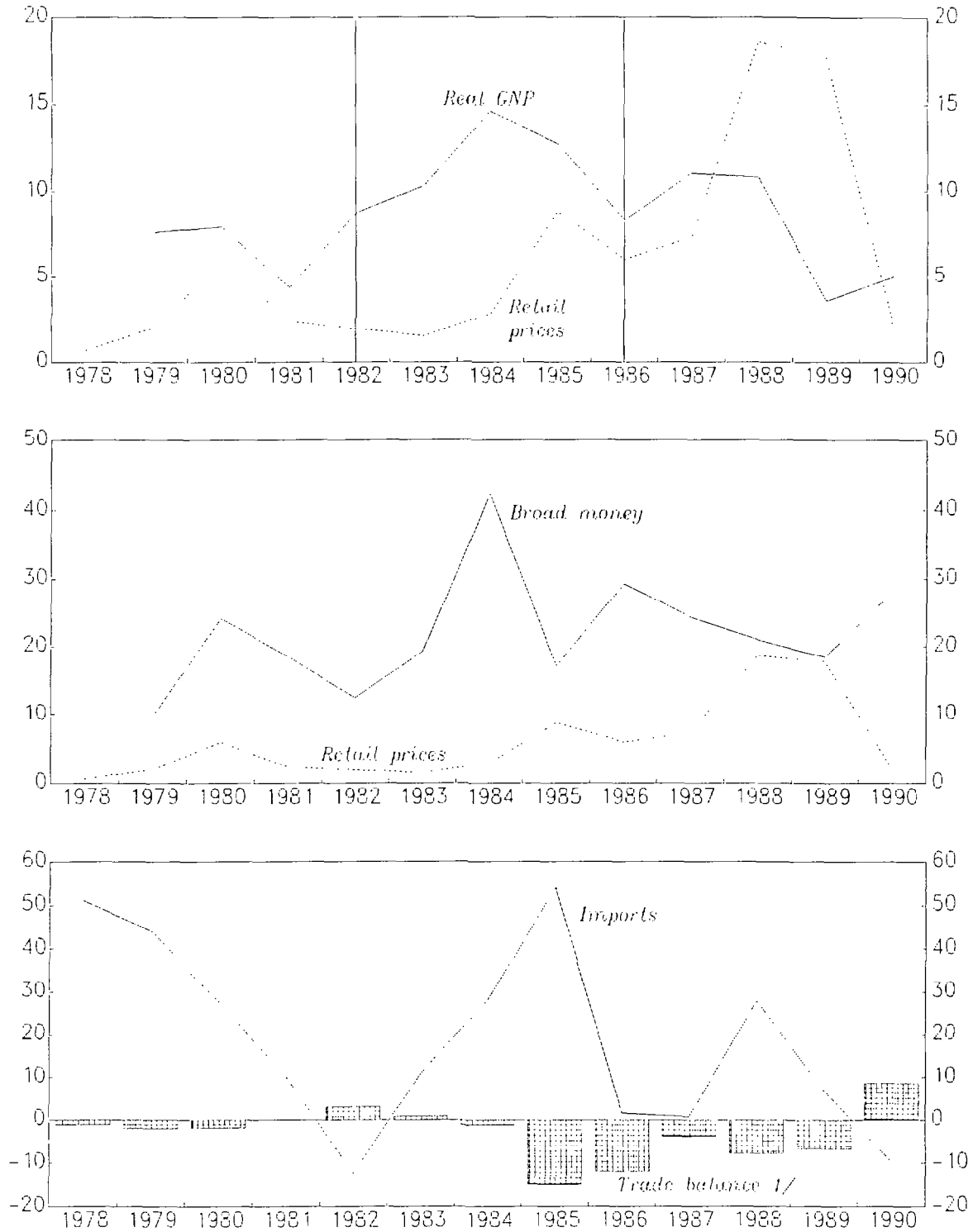
In the period 1982-84, the economy grew rapidly, led by strong growth in agricultural production, while inflation averaged less than 2 1/2 percent a year and the balance of payments strengthened (see Table 2). Encouraged by the success of the rural reforms and given the favorable macroeconomic conditions, the authorities initiated major changes in the price, wage, tax, financial and the trade and exchange systems during the period 1983-85. Under price reforms announced in late 1984, the role of the market in price determination was enlarged and mandatory controls on a wide range of prices were dropped, leading to the emergence of a two-tier price system. Also in 1984, major changes were introduced in the wage system, with enterprises given more leeway in setting bonuses and in allocating their social funds.

CHART 2

CHINA

DEVELOPMENTS IN KEY ECONOMIC VARIABLES, 1978-90

(Annual percentage change: unless indicated otherwise)



Sources: China Statistical Yearbook, 1990; and IMF, *International Financial Statistics Yearbook*, 1990.
1/ In billions of U.S. dollars.

Table 2. China: Selected Economic Indicators, 1979-90

	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990 Est.
<u>(Percentage change)</u>												
Real GNP	7.6	7.9	4.4	8.7	10.3	14.6	12.7	8.3	11.0	10.8	3.6	5.0
Real gross industrial output	8.8	9.3	4.3	7.8	11.2	16.3	21.4	11.7	17.7	20.8	8.5	7.6
Real gross domestic investment	11.8	-13.1	9.0	13.8	13.5	49.5	38.0	14.5	13.0	25.3	11.1	-9.5
Merchandise exports, f.o.b. <u>1/</u>	40.1	33.7	20.5	-4.0	-2.0	15.4	5.0	2.6	34.9	18.2	5.3	19.2
Merchandise imports, f.o.b. <u>1/</u>	43.9	24.8	12.6	-16.4	10.9	27.6	60.0	-8.7	4.3	27.4	5.3	-13.3
Retail prices												
Average	2.0	6.0	2.4	1.9	1.5	2.8	8.8	6.0	7.3	18.6	17.8	2.1
End of period	7.7	2.2	2.6	0.1	3.7	4.8	10.7	6.2	9.1	26.7	6.4	2.2
Broad money	9.7	24.1	19.7	13.1	19.2	42.4	17.1	29.3	13.2	21.0	18.4	28.8
Currency in circulation	26/3	29.1	14.5	10.9	20.7	49.4	24.7	23.3	19.5	46.6	9.8	12.8
<u>(In percent of GNP)</u>												
Gross domestic investment	34.1	26.5	27.0	28.2	28.7	35.8	40.1	40.4	39.2	39.7	39.2	32.2
Of which: Fixed investment	...	20.4	20.1	23.1	23.6	30.8	31.4	32.7	34.0	33.5	28.3	25.9
Gross national savings	34.0	26.8	27.9	30.3	30.2	36.6	36.1	37.8	39.3	38.7	38.2	35.5
Current account balance	-0.1	0.3	0.9	2.1	1.5	0.8	-4.0	-2.6	0.1	-1.0	-1.0	3.3
Overall budgetary balance	-5.2	-3.3	-1.2	-1.4	-1.7	-1.5	-0.5	-1.9	-2.0	-2.6	-1.8	-2.1
Revenue	31.6	29.4	29.0	27.2	27.4	26.4	26.6	25.1	22.6	20.0	20.9	19.9
Expenditure	36.7	32.7	30.3	28.6	29.1	27.9	27.1	27.1	24.7	22.5	22.7	22.0

Sources: China Statistical Yearbook, 1990, and International Financial Statistics Yearbook 1990.

1/ In U.S. dollar terms.

The People's Bank of China (PBC) was transformed into a central bank in January 1984, and greater autonomy was given to the specialized banks to extend credits to enterprises. There was a major liberalization of the trade and exchange system in 1984-85: foreign trade corporations were made responsible for their profits and losses and were allowed to retain a greater portion of the foreign exchange that they earned.

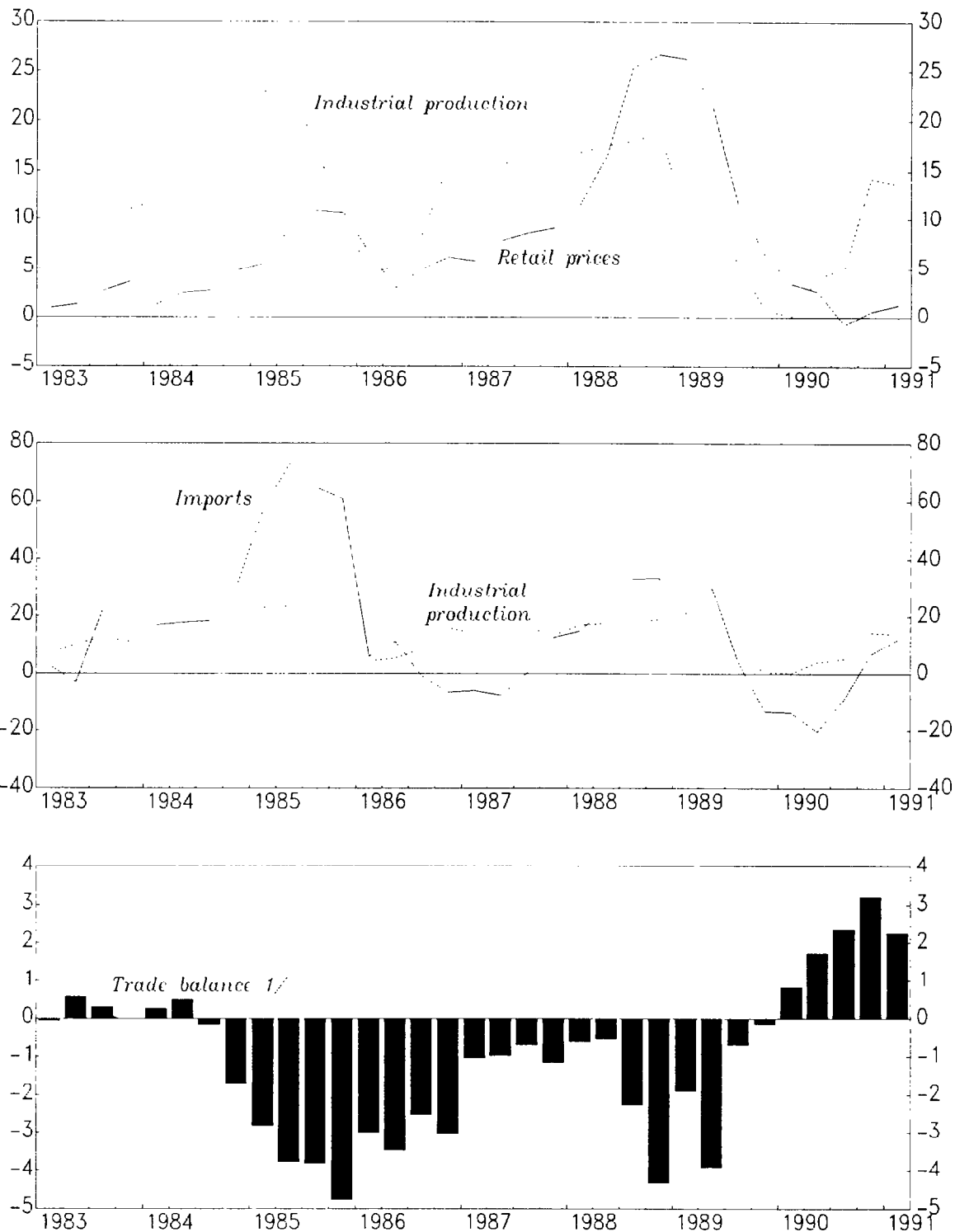
The reform measures were not, however, accompanied by strong financial policies and there was a strong increase in aggregate demand as enterprises granted large increases in wages and bonuses and borrowed heavily to expand capacity. The total wage bill increased by almost 45 percent in the last quarter of 1984 while the 12-month growth in real industrial production rose from less than 12 percent in the first half of 1984 to more than 23 percent in the first half of 1985 (Table 3 and Chart 3). The ability of the reconstituted PBC to enforce financial discipline through the old system of quantitative credit controls was hampered by the increasing tendency of enterprises, backed by the local authorities, to make strong demands on the specialized banks. Consequently, domestic credit expanded sharply during 1984, and annual growth in broad money rose from less than 20 percent in the first quarter of the year to over 40 percent by year-end, while growth in currency rose to 50 percent.

Reflecting the strong increase in aggregate demand and the rapid credit expansion, the 12-month inflation rate rose markedly from about 1 percent in the first quarter of 1984 to almost 11 percent in the second half of 1985. At the same time, the annual growth in imports accelerated from about 17 percent to 73 percent, and the trade balance swung from a surplus of \$0.5 billion in the second quarter of 1984 to an average deficit of almost \$4 billion per quarter in 1985. The large trade deficit in 1985 was financed by a combination of sharply higher foreign borrowings and a decline of \$4.6 billion in net international reserves.

Once again, the authorities reacted by tightening both indirect economic policy instruments and direct administrative controls. With regard to the trade and exchange system, the renminbi was depreciated; tight foreign exchange controls were applied; and all foreign borrowings were required to be approved by the State Administration of Exchange Control (SAEC). In the case of monetary policy, the primary emphasis was on tightening credit policy: the system of reserve requirements and controls over PBC lending to the banks was strengthened; the authority of the PBC was increased to enable it to resist pressures for additional credit; and interest rates were raised.

Reflecting the measures taken, the 12-month growth rate of broad money fell from 47 percent in the first quarter of 1985 to 17 percent by year-end. The 12-month inflation rate responded quickly, declining from about 11 percent at end-1985 to 3 percent by the end of the first half of 1986, while the annual growth in industrial production declined sharply to about 5 percent over the same period. Similarly, reflecting the tightening in

CHART 3
CHINA
DEVELOPMENTS IN KEY ECONOMIC VARIABLES, 1983-91
(Percentage change over 12 months; unless indicated otherwise)



Source: Table 3.

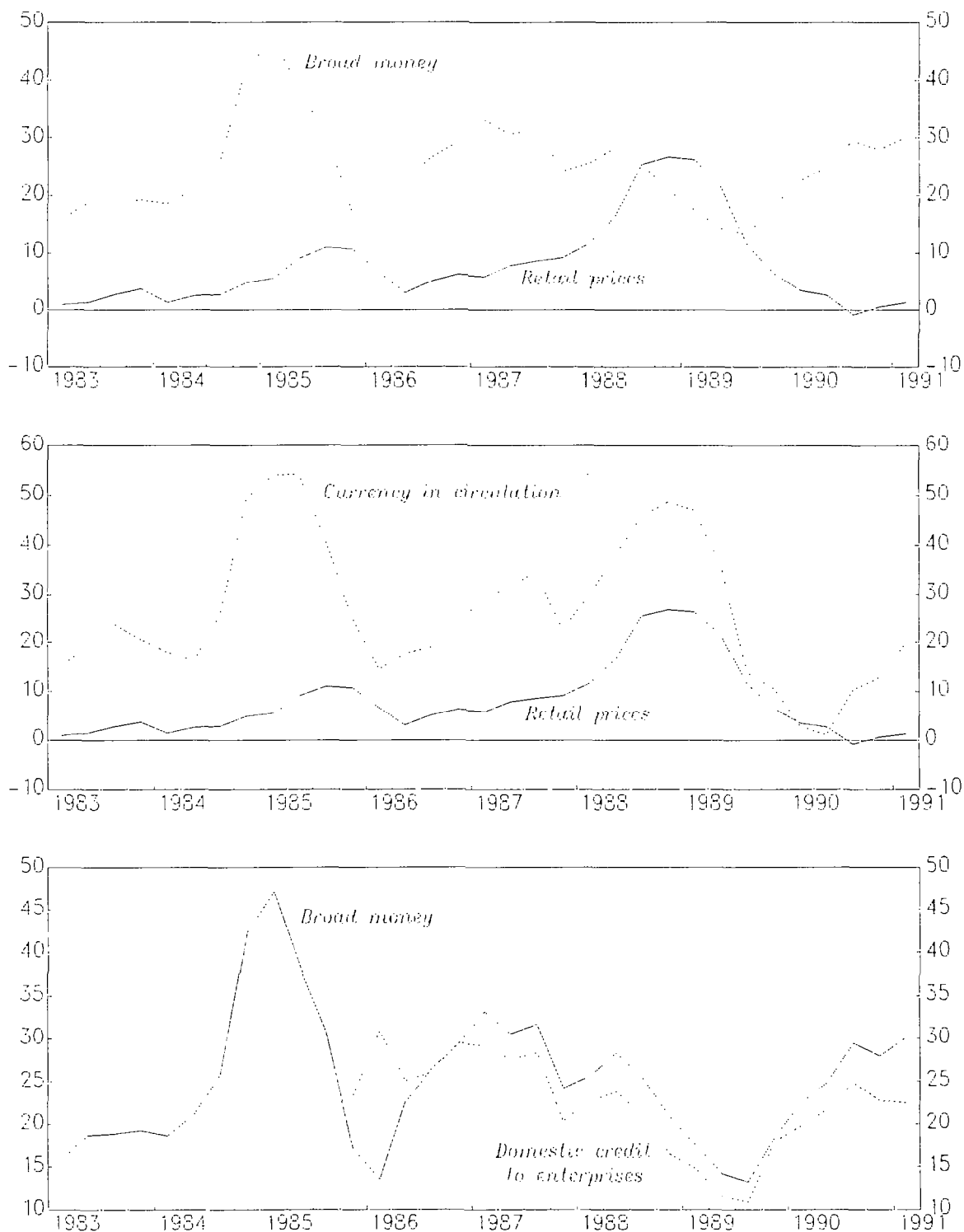
1/ In billions of U.S. dollars.

CHART 3 (concluded)

CHINA

DEVELOPMENTS IN KEY ECONOMIC VARIABLES, 1983-91

(Percentage change over 12 months)



Sources: Table 3; and IMF, *International Financial Statistics* (various issues).

Table 3. China: Behavior of Key Economic Variables, 1982-91

(Percentage change over 4 quarters; unless otherwise indicated)

	Retail price index	Real industrial production	Merchandise imports, c.i.f. <u>1/</u>	Currency in circulation	Broad money	Trade balance <u>2/</u>
1982						
Q1	3.3	11.6	...	...	...	0.8
Q2	2.8	8.7	...	...	...	0.3
Q3	1.1	5.8	...	...	...	0.9
Q4	0.1	4.1	...	...	...	1.0
1983						
Q1	1.0	7.0	2.7	14.7	15.7	-0.1
Q2	1.3	10.3	-3.0	19.7	18.7	0.6
Q3	2.7	12.6	22.0	23.8	18.9	0.3
Q4	3.7	11.1	30.1	20.7	19.3	--
1984						
Q1	1.3	11.9	16.8	18.0	18.6	0.3
Q2	2.5	11.4	17.9	16.4	21.1	0.5
Q3	2.7	14.4	18.4	25.7	25.9	-0.2
Q4	4.8	17.5	30.7	49.5	42.4	-1.7
1985						
Q1	5.5	23.0	57.3	54.1	47.0	-2.8
Q2	9.0	23.4	73.2	54.2	38.3	-3.8
Q3	10.9	17.3	64.8	40.8	30.8	-3.8
Q4	10.7	10.2	60.8	25.0	17.1	-4.8
1986						
Q1	6.5	4.4	5.8	14.4	13.5	-3.0
Q2	3.0	5.3	11.2	17.6	22.6	-3.5
Q3	5.0	8.4	-0.9	19.0	26.6	-2.5
Q4	6.2	15.9	-6.5	24.1	29.2	-3.0
1987						
Q1	5.8	13.9	-6.0	29.1	33.2	-1.0
Q2	7.8	15.7	-7.6	31.5	30.6	-1.0
Q3	8.6	16.1	0.1	34.6	31.6	-0.7
Q4	9.1	13.4	12.7	22.5	24.2	-1.1
1988						
Q1	11.6	16.9	14.9	29.8	25.6	-0.6
Q2	16.5	17.6	22.7	38.0	28.4	-0.5
Q3	25.4	18.0	33.5	45.7	25.5	-2.3
Q4	26.7	18.8	33.6	48.7	21.0	-4.3
1989						
Q1	26.3	10.4	20.9	46.9	17.6	-1.9
Q2	21.5	11.1	30.2	35.9	14.2	-3.9
Q3	11.4	5.4	4.0	13.7	13.2	-0.7
Q4	6.4	0.7	-13.4	10.5	18.4	-0.1
1990						
Q1	3.4	0.1	-13.7	2.8	22.5	0.8
Q2	2.6	4.1	-20.4	1.1	24.9	1.7
Q3	-0.8	5.0	-8.9	10.3	29.5	2.3
Q4	0.6	14.2	6.6	12.7	28.0	3.2
1991						
Q1	1.3	13.7	11.8	20.0	30.1	2.2

Sources: Table 5; and China Customs Statistics (various issues).

1/ In U.S. dollar terms.

2/ In billions of U.S. dollars.

credit policy as well the administrative measures, import growth was reduced sharply beginning in the first quarter of 1986; as a result, the trade balance began to improve and the quarterly trade deficit was reduced to about \$1 billion during 1987.

3. Third cycle, 1986-90

The decline in inflation and the improvement in the trade balance in early 1986 led the authorities to ease credit and monetary policy and to proceed with the reform process. During the next few years, the enterprise management system was further reformed with the adoption of the contract responsibility system (CRS). ^{1/} The contract responsibility system, however, had a negative impact on budgetary revenue and the overall fiscal deficit widened from 0.5 percent of GNP in 1985 to 2 percent in 1986-87 (see Table 2). In order to foster greater competition in the banking system, restrictions on specialized banks were loosened and two universal banks were established in 1987. To promote exports, the first foreign exchange adjustment centers were established in late 1986, allowing foreign trade corporations to trade in foreign exchange at rates freely negotiated (to a large extent) by eligible participants; in early 1988, foreign exchange retention was increased to 70 percent for key export industries.

Reflecting the easing in credit and monetary policy, the 12-month growth in broad money rose rapidly from 13 percent in the first quarter of 1986 to over 30 percent in the first three quarters of 1987 (see Table 3 and Chart 3). Economic activity responded quickly and the annual growth rate of industrial production accelerated from 4 1/2 percent to about 15 percent over the same period. The rapid growth in liquidity coupled with the strong rebound in aggregate demand led, however, to a rekindling of inflation and by the third quarter of 1987, the 12-month inflation rate had risen to over 8 percent. This prompted the authorities to tighten credit policy for a period, but this tightening was not sustained and by early 1988 monetary policy was again relaxed. This relaxation led, in turn, to overheating in the economy, and inflation and industrial output growth accelerated.

Against this background, the authorities implemented major price adjustments in April 1988. Administered prices of pork, vegetables, sugar, and eggs were increased by as much as 60 percent, compensated by an income subsidy of about 10 percent. These adjustments in the context of an overheated economy led to a sharp increase in the overall price level. Seasonally adjusted, the monthly inflation rate soared from an annual rate of 20 percent in April to 32 percent in May, and as a result, interest rates became highly negative in real terms. In June the authorities announced plans for a major price reform to be implemented in 1989. The announcement triggered panic buying as households drew down their savings deposits and

^{1/} See Blejer and Szapary (1989) for a description and analysis of the main features of the contract responsibility system.

monthly price increases (seasonally adjusted) rose to an annual rate of over 50 percent in August 1988. The strong growth in aggregate demand also stimulated a sharp rise in imports; the 12-month growth in imports, which had been negative in the first half of 1987, rose to more than 30 percent by the second half of 1988, leading to a deterioration in the foreign reserve position.

Faced with this crisis, the Government postponed further price liberalization and adopted a number of stabilization measures under a program of "rectification". First, spending guidelines were introduced to slash state investment outlays in 1989 by 20 percent. Second, the PBC significantly tightened monetary policy. Long term deposit rates were indexed to inflation while nominal interest rates were increased in September 1988 and again in February 1989 (by a total of more than 4 percentage points) to encourage financial savings and to discourage enterprises from excessive bank borrowing. At the same time, credit expansion was halved, falling from an annual rate of about 23 percent in the third quarter of 1988 to 11 percent in the third quarter of 1989; the tightening in credit policy was mirrored in a corresponding decline in the 12-month growth of broad money which fell from 26 percent to 13 percent over the same period. In the external sector, the authorities tightened administrative controls on imports and, in December 1989, the renminbi was devalued by 21.2 percent.

The tightening in monetary policy had an immediate effect on inflation and economic activity. The annualized monthly rate of price increase, seasonally adjusted, was more than halved in October 1988 and declined to single digits by June 1989. Industrial production also responded quickly and, by early 1989, the growth rate had slackened markedly. The slowdown in economic activity and the tightening of import controls contributed to a marked decline in imports; the annual growth in imports fell to 4 percent in the third quarter of 1989 and became negative in subsequent quarters. Reflecting the slowdown in imports, the quarterly trade balance swung from a deficit averaging \$3 billion in the second half of 1988 to a surplus averaging \$2 1/2 billion in the last two quarters of 1990 (see Table 3).

The marked slowdown in economic activity and inflation during 1989 prompted the authorities to relax credit policy beginning in the last quarter of 1989 and to cut interest rates in March and August of 1990. As a result, the 12-month growth in broad money accelerated from 13 percent in the third quarter of 1989 to 18 percent by year-end and further to about 29 percent in the third and fourth quarters of 1990. The easing of monetary policy led to a recovery in industrial production beginning in the second quarter of 1990 and by year-end, the 12-month growth rate had reached 15 percent. However, the growth in industrial output was not accompanied by a corresponding recovery in domestic demand, which remained sluggish until late in the year. As a result, there was a strong build-up of inventories and many enterprises continued to experience losses. Reflecting the effects of a bumper harvest in agriculture and the weakness in domestic demand, inflation remained low during 1990, averaging 2.1 percent for the year as a whole.

IV. Comparison and Analysis of the Cycles

The above section has identified and described three distinct episodes of macroeconomic instability during the reform period. A comparison with the pre-reform period shows that, while price instability and external disequilibrium were absent during most of the earlier period, they became prominent features of the macroeconomic cycles in the reform period (see Chart 1). This is not surprising precisely as the thrust of the reforms was to reduce administrative controls and to rely more on market signals to guide the economy. As noted above, the reforms led to a significant liberalization of prices and the trade system while economic agents became increasingly autonomous. As a result, the economy had become more integrated and imbalances in one sector were likely to be transmitted and manifested in other sectors of the economy. Hence it is not surprising that an excessive expansion of credit would be reflected not only in higher production but also in higher prices and a deterioration in the balance of payments. Indeed, Chart 1 also indicates that each successive expansionary episode since 1978 has been associated with a higher rate of inflation than before.

However, a comparison of the cycles in the periods before and after 1978 shows that the swings in production were much smaller during the reform period reflecting, to certain extent, the greater flexibility in prices and the openness of the economy. Moreover, productivity gains from the reforms were substantial and the economy grew at a significantly faster pace in the latter period.

The above comparison of macroeconomic cycles in the pre-reform and the reform periods has already hinted at the complex relationships between reforms and macroeconomic management. It is clear that macroeconomic cycles are not unique to the reform period; the difference lies in the emergence of price instability and external imbalance during the reform period. However, as suggested above, there might be a trade-off between price stability and external balance on the one hand and volatility of production on the other. The rest of this section examines the characteristics of the macroeconomic cycles during the reform period and explores the links between the reform process and macroeconomic instability. 1/

From the description of the macroeconomic cycles, it appears that there is a distinct chronological pattern in the process. In particular, the macroeconomic imbalances were associated with, and in the last two episodes were preceded by, a weakening in financial policies. Furthermore, in all three instances, macroeconomic stability was restored through a major tightening in credit and monetary policies. This suggests that weak macroeconomic management was the underlying cause of the imbalances. Given

1/ The discussion below has benefited from studies by Blejer et. al., (1991).

that cycles were present prior to the introduction of reforms, the reform process cannot be the cause of the cycles; it is also notable that, in the reform period, macroeconomic stability was restored on each occasion without a complete rollback of the reforms that were introduced. Nevertheless, there is a close interconnection between the macroeconomic cycles of the reform period, and the reforms themselves.

When reforms were initiated in 1979, the system of macroeconomic management was the same one that had existed in the pre-reform period. Under this system, price stability and external balance were maintained through administrative controls. Monetary policy was viewed mainly as an instrument of the planning mechanism and played only a minor role in macroeconomic management. The rural reforms led to a weakening in administrative controls and, given the passive role of monetary policy, to a surge in aggregate demand and macroeconomic imbalances. The imbalances were brought quickly under control with tighter credit policy and administrative controls. However, the rural reforms remained in place and there was a major increase in agricultural production over the next several years, reflecting productivity gains.

The macroeconomic instability caused by the implementation of the rural reforms led the authorities to introduce changes to the system of macroeconomic management to take account of the increasing role of market forces in the determination of prices and the allocation of resources. With the 1984 establishment of the People's Bank of China (PBC) as a central bank, increasing emphasis was placed on indirect instruments of macroeconomic control, such as reserve requirements, interest rates, and PBC credit to banks. However, the PBC continued to rely on the credit and the cash plans of the pre-reform era as primary instruments in its execution of monetary policy.

As noted in Sections 3.b and 3.c, the rural reforms were followed by reforms in several areas including prices, enterprise management and wages, tax and revenue sharing, and the trade and exchange system. Even more than the agricultural reforms, the latter reforms led to a substantial widening of the sphere of market mechanisms in the economy as prices and trade were liberalized and greater autonomy was given to economic agents under the contract responsibility system and the trade responsibility system. However, unlike the agricultural reforms, some of these latter reforms were either inadequate or incomplete, and thus tended to undermine the effectiveness of macroeconomic management.

In particular, the enterprise reform under the contract responsibility system was asymmetrical in that the budget constraint on enterprises remained "soft": unprofitable enterprises continued to be supported either by the state or through bank credits rather than being allowed to close. This pre-emption of financial resources by weak enterprises tended to undermine the ability of the authorities to conduct appropriate fiscal and monetary policies. On the revenue side, the contract responsibility system resulted in a loss of tax buoyancy as the profits to be transferred to the

state were normally fixed in nominal terms for the duration of the contract. In part, the "softness" in the budget constraint on enterprises was attributable to difficulties in determining the profitability of enterprises because of relative price distortions, attributable in turn to the incompleteness of price reforms.

The incompleteness of price reforms in itself weakened fiscal management directly as considerable resources had to be devoted to price subsidies and to cover the losses of those enterprises whose prices remained fixed at an artificially low level. Also, the devolution of an increasing share of total revenue and expenditures from the central government to local governments reduced the ability of the central government to use the budget to influence aggregate demand.

The weakness in macroeconomic management resulting from the incompleteness of reforms tended to exaggerate the effects of policy shifts. This was made vividly clear in the most recent cycle of macroeconomic instability. Although credit expansion was sharply curtailed in late 1988 to combat inflation, the subsequent relaxation in credit policy in late 1989 and 1990 was necessitated to a large extent by the need to bail out inefficient enterprises and to finance a widening fiscal deficit.

The discussion above has highlighted the adverse effects that incompleteness of reforms has had on macroeconomic management, indicating the importance of proceeding with reforms on a broad front both to consolidate the gains made in economic efficiency and to promote macroeconomic stability. In practice, however--and understandably--the emergence of domestic and external imbalances has caused the authorities to slow down or suspend reforms, and resort instead to tight credit policy enforced by administrative means to restore stability. Once restored, stability has proved impossible to maintain for long both because of the incompleteness of reforms and because of the continued reliance on traditional methods of formulating the credit and the cash plans, the two principal instruments of monetary management of the pre-reform period. The following section attempts to illustrate that, while an effective system of macroeconomic management using indirect instruments is contingent on the completion of economic reforms, a better method of monetary policy formulation, entailing different monetary targets, also is crucial for improved macroeconomic management.

V. Statistical Analysis

The description of the macroeconomic cycles and the discussion above have highlighted the important roles that certain variables played in the cycles. In this section, the relationships among five key economic variables are analyzed using a statistical technique known as "Granger" test in order to understand better the causality ordering among the variables. The five variables are industrial production, retail prices, broad money, currency in circulation, and merchandise imports. These variables were

selected mainly because of the prominent roles that they played in the macroeconomic cycles; however, an equally important selection criterion was the requirement that the data series be of sufficient length to perform the analysis. Thus certain key economic variables such as total credit expansion by the banking system and major fiscal aggregates were excluded because of lack of sufficient data. The results from the tests should therefore be viewed as preliminary findings which could be improved upon as longer time series become available.

Table 4 summarizes the results of the tests which are described in more detail in Appendix II. 1/ Briefly, the Granger test of causality between two variables, x and y, is performed by regressing y (the dependent variable) on lagged observations of itself and lagged and/or contemporaneous observations of x (the independent variable) as in equation (1) below:

$$Y_t = \sum_{i=1}^m \alpha_i y_{t-i} + \sum_{j=0 \text{ or } 1}^n \beta_j x_{t-j} + u_t \quad (1)$$

The causality can be bidirectional and so the test is performed twice by switching x_t and y_t . Basically, the test provides an indication of the ability of one variable to explain or predict another variable after taking account of all the information contained in the history of the second variable. 2/ In Table 4.A, the Granger causality test is performed using contemporaneous and lagged values of the independent variables while in Table 4.B, the test is performed using only the lagged values of the independent variables. The latter test, consequently, is a test of whether the independent variables are leading indicators of the dependent variables while the former test gives an indication of contemporaneous causality between variables.

Table 4.A indicates that two measures of money, i.e., broad money and currency in circulation, are important in explaining inflation but Table 4.B shows that only broad money is a good leading indicator of inflation. This implies that while the behavior of currency in circulation may be important in explaining inflation, it is not useful as a leading indicator as it is

1/ The tests were performed using data from the first quarter of 1982 to the third quarter of 1990.

2/ This is a stronger condition than showing that there is a lead-lag relation between two variables, say from the reading of a chart, as the explanatory power of the "leading" indicator may disappear once account is taken of information contained in the lagged values of the other variable.

Table 4. Tests for Granger Causality

A. Tests for Contemporaneous Granger Causality

	Dependent Variable				
	Retail Prices	Industrial Production	Imports	Currency in Circulation	Broad Money
Retail Prices		Y**	N	Y*	N
Industrial Production	Y*		Y**	Y**	N
Imports	N	Y**		N	N
Currency in Circulation	Y**	Y**	Y**		Y**
Broad Money	N	Y**	Y**	Y**	

B. Tests for Leading Indicator

	Dependent Variable				
	Retail Prices	Industrial Production	Imports	Currency in Circulation	Broad Money
Retail Prices		Y**	N	N	N
Industrial Production	Y*		N	Y**	N
Imports	N	N		N	N
Currency in Circulation	N	Y**	Y**		N
Broad Money	Y*	Y**	Y**	N	

Y* - Significant at the 10 percent level

Y** - Significant at the 5 percent level

N - Not significant

contemporaneous with inflation. ^{1/} On the other hand, the results imply that changes in broad money should be closely monitored as they provide signals of building inflationary pressure. Another useful leading indicator of inflation is the change in industrial production. This should not be surprising as overrapid industrial growth--reflecting overheating in the economy--was a major factor in the two most recent episodes of high inflation. However, the causality is also contemporaneous and bidirectional, that is, high inflation is associated with rapid industrial growth.

With regard to industrial production and imports, changes in imports are strongly correlated with changes in industrial production but the causality is bidirectional and contemporaneous. The causality is expected as most imports are capital or intermediate goods destined for the industrial sector; however, the contemporaneity of the causality is somewhat surprising as one would have expected imports to lag industrial production. However, Table 4.B shows that broad money and currency in circulation are good leading indicators of both imports and industrial production.

Finally, the tests show that while the change in broad money is a good leading indicator and affects most variables contemporaneously, the reverse is not true except for the change in currency in circulation which is one component of broad money. In fact, Table 4.B shows that the change in broad money is not predictable from the lagged values of any of the other variables. These findings are important as they imply that broad money is exogenous with respect to the key economic variables, which in turn may be attributable to the fact that it is closely linked to overall credit by the banking system, a policy variable largely under the control of the authorities. In contrast, changes in currency in circulation are determined simultaneously with inflation and changes in industrial production.

VI. Concluding Remarks

The sections above have examined the cycles of macroeconomic instability in China during the last 12 years focusing, in particular, on the complex relationships between reforms and macroeconomic management. In addition, some statistical analyses were made of the causal relationships among key variables which played important roles in the macroeconomic cycles. It was argued that the incompleteness of reforms tended to undermine macroeconomic management and, therefore, that the reform process should be pursued to completion in order to strengthen macroeconomic management and consolidate earlier efficiency gains. It was also observed that existing shortcomings in macroeconomic management impeded the reform process because each time macroeconomic imbalances had emerged the authorities suspended and even retrenched some of the reforms while they

^{1/} This result is consistent with the findings by Burton and Ha (1990) on the dynamic response of real cash balances with respect to inflation.

resorted to tight credit policy and administrative measures to restore stability.

The weakness in macroeconomic management can be traced in part to the continued reliance of the monetary authorities on the old system of formulating the credit and cash plans, which failed to take sufficient account of the increasing role that market mechanisms were playing in the economy. In particular, the liberalization of prices and trade and the greater autonomy of economic agents implied that real money balances had become endogenous and that an excess supply of money would lead to higher inflation or external disequilibrium. ^{1/} However, in formulating the credit and cash plans, the authorities did not give sufficient weight to the monetary implications of expanding credit. As a result, the behavior of broad money was highly erratic, with adverse consequences for macroeconomic stability.

The importance of paying attention to broad money is strengthened by the statistical analysis in Section 5 which showed that broad money played a unique role in the macroeconomic cycles. In particular, it was exogenous to other key economic variables and was a good leading indicator of the turning points in the macroeconomic cycles. The results suggest that targeting broad money might be an efficient way to achieve macroeconomic stability. In other words, in formulating the credit plan, the authorities should make sure that the total expansion in credit is consistent with the growth in demand for broad money. Such an approach may not prevent the emergence of macroeconomic cycles but it would at least reduce their amplitude and frequency to the extent that monetary policy is consistent with the overall objective of price stability and external equilibrium. This, in turn, would provide a more conducive environment for the sustained implementation of reforms.

^{1/} Studies by Burton and Ha (1990), Chow (1987) and others have shown that relatively stable demand functions exist for a range of monetary aggregates.

China: Chronology of Key Economic Events

- 1949-52 - Rehabilitation of war-torn economy marked by hyperinflation.
- 1953-57 - First Five-Year Plan published in 1955. Adoption of central planning.
- 1955-56 - Collectivization of agriculture.
- 1958-59 - Great Leap Forward.
- 1960-62 - Famine resulting from poor harvest. Inflation reached 16 percent in 1961.
- Early 1960s - Decentralization of planning and allocation to the provinces.
- 1966-76 - Cultural Revolution.
- 1970s - Most enterprises placed under the authority of provinces.
- 1977-78 - Beginning of trade liberalization.
- December 1978 - Third Plenum of the Chinese Communist Party. Initiation of rural reforms.
- 1979 - Freeing up of the rural trade fairs or "free markets." Introduction of the household responsibility system. Nuclear farm families were allocated a portion of formerly collective land for a period of 15 years in exchange for meeting certain tax and crop delivery obligations to the state. State increased the premium paid for above-quota delivery of grain and raised farm purchase prices. Procurement prices increased by 20-25 percent.
- Agricultural Bank of China re-established; China International Trust and Investment Corporation (CITIC) created.
- 1979-80 - Experimentation with profit retention system.
- Local governments given larger share of revenues.

- 1980 - Inflation rose to 6 percent.
- Bank credit progressively substituted for budgetary grants in financing working capital and fixed investment.
- Greater use of interest rates as monetary policy tool.
- Establishment of four special economic zones.
- 1981 - Introduction of treasury bonds.
- 1983 - Individual household farming became the dominant form of farming.
- Tax reform: profit transfers from state-owned enterprises changed to profit taxation; tax rate set at 55 percent.
- Introduction of product tax, value-added tax, business tax, and urban tax.
- 1984 - Bumper grain harvest - 407 million metric tons.
- Greater operational authority given to foreign trade corporations.
- 14 coastal cities opened for direct foreign investment.
- Provinces allowed to retain 25 percent of foreign exchange earnings.
- January - Transformation of People's Bank of China into a central bank and establishment of Industrial and Commercial Bank of China (ICBC). Introduction of redeposit requirements.
- October - Initiation of urban reform. Greater role for guidance planning.
- 1984-85 - Trade liberalization accompanied by rapid credit expansion led to a substantial run on foreign exchange reserves, which was followed by a reintroduction of tight central exchange controls.

- 1985
 - Enterprises allowed to retain 25 percent of foreign exchange earnings, of which typically half is shared with the local authorities.
 - Inflation reached about 9 percent.
 - Local governments given larger share of revenues.
 - Competition between specialized banks encouraged.
 - Establishment of trust and investment corporations.
 - Foreign borrowing needs approval of State Administration of Exchange Control.
- 1985-86
 - Two-tier price system introduced.
- 1986
 - SAEC to monitor external debt.
 - Foreign exchange adjustment centers established.
 - Exchange rate depreciated by 13.6 percent in July.
- 1985-87
 - Gradual move to contract responsibility system for enterprises.
- 1987
 - Establishment of Bank of Communications and CITIC Industrial Bank.
- 1988
 - April
 - Increase in state food shop prices for pork, vegetables, sugar, and eggs by as much as 60 percent, with compensating income subsidy of about 10 percent.
 - June
 - Announcement of major price reform.
 - Panic buying.
 - August
 - Twelve-month inflation rose to more than 23 percent; the annualized monthly price increase was more than 50 percent on a seasonally adjusted basis.
 - Foreign exchange retention for key export sectors increased to 70 percent.
 - September
 - Interest rate on deposits raised by 1 percent. Introduction of indexed-linked interest rates on deposit rates of three years or longer.

QIV - Tightening in credit policy.

1989

February - Interest rates on deposits increased by 3 percent and all lending rates by 2 percent.

June - Tiananmen incident; imposition of economic sanctions by industrial countries.

November - Fifth Plenum of the Thirteenth Party Congress; economic program over the next two years to concentrate on stabilization, restoring growth, and correcting deficiencies.

December - Exchange rate devalued by 21.2 percent.

QIV - Relaxation of credit policy.

1990 - Credit plan adjusted from original target of Y 170 billion to Y 250 billion. Strong growth in broad money. Industrial production grew rapidly in final quarter. Administered prices of gasoline, coal, transportation and cotton cloth adjusted upward.

- Bumper grain harvest estimated at 435 million metric tons.

March - Interest rates reduced by an average of 1.26 percent.

August - Interest rates reduced by an average of 1.08 percent.

November - Exchange rate devalued by 9.57 percent.

December - Shanghai Securities Exchange opened for trading.

1991 - Eighth 5th Year Plan and Ten-Year Program adopted by the National People's Congress. Cautious resumption of reforms.

January - Foreign exchange retention system revised.

- April
 - Y 2.5 billion of Treasury bonds were issued through an underwriting syndicate for the first time. Interest rates on deposits and loans reduced by an average of 1.0 and 0.7 percentage points, respectively.
 - Exchange rate adjusted by small amounts every few days.
- May
 - Grain and cooking oil prices increased, for the first time in 25 years, by an average of 70 and 160 percent, respectively. Wages were increased by 6 yuan per month, equivalent to about 3 percent of monthly salary.

Granger Causality Test

This Appendix explains the Granger Causality test and the procedures used to obtain the results reported in Table I.4 above. The Granger causality is formally defined as follows: Let $F(A/B)$ denote the conditional distribution function of A given B, and let Ω_t represent all information in the universe at time t. Then if

$$F(y_{t+k} / \Omega_t) = F(y_{t+k} / \Omega_t - x_t) \quad (2)$$

for all $k > 0$, where $\Omega_t - x_t$ is all the information in the universe apart from the series x_t , then x_t does not cause y_t . If equation (2) does not hold, then x_t does cause y_t . It should be noted that the concept of Granger causality is primarily statistical and can be bidirectional. Of course, the causality may also be economic but the argument would have to be based on some economic model or theory.

In practice, the Granger test is performed by running the following regression:

$$y_t = \sum_{i=1}^m \alpha_i y_{t-i} + \sum_{j=0}^n \beta_j x_{t-j} + u_t$$

where y_t is the dependent variable and x_t is the independent variable. The test statistics is the F-value under the null hypothesis that $\beta_j = 0$ or all j's. In order to perform the Granger test, the variables x_t and y_t must be stationary, otherwise the test statistics will not have the standard distribution. Thus the time series must first be tested for stationarity using any one of the several tests that have been developed in recent years such as the cointegrating regression Durbin-Watson (CRDW) statistics or the augmented Dickey-Fuller statistics (ADF). If the tests show that the original time series are not stationary, then it is necessary to prewhiten the series (that is, make them stationary) before performing the Granger test.

A second important consideration in applying the Granger test is that in order for the results to be robust, the time series must have a sufficiently large number of observations. This criterion rules out the use of

annual time series as the number of observations spanning the reform period is too short. Many variables in China, including most fiscal aggregates, are available only on an annual basis and cannot therefore be utilized. Consequently, the test was performed using five key variables which have observations from the first quarter of 1982 to the third quarter of 1990: index of retail prices (1980=100); industrial production at constant prices; imports (in U.S dollars); currency in circulation; and broad money in nominal terms. ^{1/}

Since the original time series are highly seasonal and trended (Table 5), they were prewhitened by first deseasonalizing them and then taking the first difference of the log transform of the variables, that is, the derived series $z_t = \ln(x_t) - \ln(x_{t-1})$. The derived series are basically quarterly percentage changes of the deseasonalized series (Table 6). As shown in the tabulation below, the CRDW statistics of the derived series are all significantly positive implying that the series are stationary. The Granger test was performed on the derived series.

Tabulation 1. Test for Stationarity

	Retail prices	Industrial production	Imports	Currency in circulation	Broad money
CRDW	0.700	1.948	1.743	1.184	1.24

Critical value of CRDW at the 5 percent significance level = 0.397.

^{1/} The test was also performed with exports (in U.S. dollars) as a sixth variable, but the results do not add substantially to the analysis and exposition of the macroeconomic cycles and are not reported in this paper.

Table 5. China: Key Economic Variables, 1982-91

	Retail price index <u>1/</u>	Real industrial production <u>2/</u>	Merchandise imports, c.i.f. <u>3/</u>	Currency in circulation <u>4/</u>	Broad money <u>4/</u>
1982					
Q1	105.2	129.3	4.4	37.8	226.1
Q2	105.4	143.6	5.1	35.3	226.4
Q3	104.2	136.2	4.5	37.7	237.4
Q4	103.8	146.8	4.9	43.9	261.5
1983					
Q1	106.2	138.3	4.6	43.3	261.7
Q2	106.8	158.4	4.9	42.2	268.7
Q3	107.0	153.4	5.5	46.7	282.3
Q4	107.6	163.1	6.4	53.0	311.9
1984					
Q1	107.6	154.8	5.3	51.1	310.4
Q2	109.5	176.5	5.8	49.1	325.5
Q3	109.9	175.5	6.5	58.7	355.3
Q4	112.8	191.6	8.4	79.2	444.0
1985					
Q1	113.5	190.4	8.4	78.8	456.4
Q2	119.4	217.8	10.0	75.7	450.3
Q3	121.9	205.8	10.7	82.7	464.7
Q4	124.9	211.1	13.5	99.0	520.1
1986					
Q1	120.9	198.7	8.9	90.1	518.2
Q2	123.0	229.4	11.2	89.1	552.0
Q3	128.0	223.0	10.6	98.4	588.2
Q4	132.6	244.6	12.6	122.8	672.2
1987					
Q1	127.9	226.2	8.3	116.3	690.0
Q2	132.6	265.5	10.3	117.1	720.8
Q3	139.0	258.8	10.6	132.4	774.3
Q4	144.7	277.4	14.2	150.4	835.0
1988					
Q1	142.7	264.5	9.6	150.9	867.0
Q2	154.5	312.2	12.7	161.7	925.3
Q3	174.3	305.5	14.1	193.0	971.4
Q4	183.3	329.7	18.9	223.6	1,009.9
1989					
Q1	180.2	291.9	11.5	221.7	1,019.2
Q2	187.7	347.0	16.5	219.8	1,056.6
Q3	194.2	322.0	14.7	219.5	1,099.9
Q4	195.0	332.1	16.4	247.0	1,195.9
1990					
Q1	186.4	292.3	10.0	227.9	1,248.9
Q2	192.6	361.1	13.1	222.1	1,319.7
Q3	192.6	338.1	13.4	242.0	1,423.9
Q4	196.1	379.3	17.5	278.5	1,530.4
1991					
Q1	188.8	332.3	11.1	273.4	1,625.0

Sources: IMF, International Financial Statistics (various issues).1/ Index 1980 = 100.2/ In billions of yuan at constant prices.3/ In billions of U.S. dollars.4/ In billions of yuan.

Table 6. China: Changes in Key Economic Variables, 1982-91

(Percentage change over previous quarter; seasonally adjusted)

	Retail price index	Real industrial production	Merchandise imports, c.i.f. <u>1</u> /	Currency in circulation	Broad money
1982					
Q1	1.7	--	...	...	...
Q2	-0.1	0.1	8.0	3.0	3.0
Q3	-0.8	0.7	-11.6	1.4	3.9
Q4	-0.8	3.4	-4.8	1.8	2.8
1983					
Q1	3.0	2.5	13.6	8.1	5.3
Q2	--	3.3	1.4	7.2	5.4
Q3	0.4	2.9	11.4	5.1	4.2
Q4	-0.2	2.1	0.5	-1.0	3.1
1984					
Q1	1.6	3.2	4.0	6.2	4.6
Q2	0.9	2.7	1.3	5.2	7.5
Q3	0.2	5.6	11.8	13.5	8.4
Q4	1.6	5.1	9.1	17.9	17.0
1985					
Q1	3.2	8.2	30.4	9.9	7.9
Q2	4.1	2.7	8.9	4.5	0.8
Q3	1.3	0.3	6.4	3.6	2.6
Q4	1.3	-1.2	4.5	5.2	5.6
1986					
Q1	0.3	3.1	-9.9	0.9	4.1
Q2	0.4	2.8	10.7	6.4	8.4
Q3	2.6	3.3	-5.0	4.9	5.9
Q4	2.4	5.6	-3.2	10.7	8.8
1987					
Q1	0.8	2.1	-4.4	4.9	6.7
Q2	2.1	3.6	4.3	7.2	5.6
Q3	2.8	3.8	3.5	7.9	6.9
Q4	2.9	2.8	7.8	1.9	3.8
1988					
Q1	3.6	6.7	1.7	10.4	7.2
Q2	6.4	3.0	7.6	13.1	7.5
Q3	10.3	4.3	12.8	14.1	4.5
Q4	4.1	3.3	7.3	5.2	1.0
1989					
Q1	3.5	0.0	-5.3	8.0	3.6
Q2	2.3	2.9	13.2	4.4	4.2
Q3	1.0	-1.0	-9.9	-4.4	3.6
Q4	-0.5	-1.4	-10.6	3.1	6.3
1990					
Q1	0.6	0.2	-4.5	-0.4	6.7
Q2	1.4	6.3	3.4	2.8	6.2
Q3	-2.4	-0.1	2.9	4.4	7.4
Q4	1.0	7.2	5.0	5.7	5.4
1991					
Q1	1.3	0.1	0.6	5.5	8.2

Source: Table 5.

1/ In U.S. dollar terms.

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