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Macroeconomic Cycles in China¹

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Abstract

This paper investigates the macroeconomic cycles China has experienced since the onset of reform in the late 1970s. It finds that the recurrent inflationary episodes that characterize the cycles are associated primarily with surges in the main components of aggregate demand. The most recent cycle stands out in achieving for the first time a reduction in inflation without a major slowdown in growth. The soft landing was facilitated by a number of factors, including increases in capacity as a result of the surge in investment spending early on in the cycle.

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SUMMARY

Notwithstanding major achievements in growth and structural transformation, China's economic performance has been punctuated by recurrent episodes of cyclical overheating and surging inflation alternating with sharp but short-lived periods of retrenchment and rapidly declining inflation.

This paper investigates the nature of these macroeconomic cycles. First, a detailed description of each of the four cycles since 1978 focuses on developments in key economic variables in each episode. Subsequently, employing a simple Phillips curve model, an econometric investigation confirms the anecdotal evidence that the inflationary episodes have generally been associated with surges in aggregate demand. It is argued, however, that the factors behind the upswings and relative importance of the components of aggregate demand have differed across cycles.

The most recent cycle stands out in having achieved a soft landing for the first time, combining a significant reduction in inflation with only a moderate slowing of growth. While the paper underscores the role of a number of structural and policy factors widely believed to have facilitated the soft landing, it argues that there is an additional important factor. The fourth cycle differed from previous cycles in that aggregate demand in the upswing was fueled mainly by a surge in investment spending. Although the strong investment demand initially increased aggregate demand more than supply—increasing inflationary pressures—it eventually led to an increase in capacity and potential output, which tended to dampen inflationary pressures and allowed the economy to settle into a soft landing despite continued strong real GDP growth.

I. INTRODUCTION

China's favorable achievements in growth and structural transformation since the initiation of economic reforms have been interrupted by periods of cyclical overheating followed by generally sharp but short-lived periods of retrenchment. Upswings have tended to be characterized by strong growth in real activity, as well as surging inflation and a deteriorating external position. Reflecting subsequent moves towards restraint, the downturns in economic activity have tended to be relatively sharp but accompanied by a marked moderation in inflation.

The period since 1978 can be divided into four cycles, as suggested by the movements in retail price inflation and growth in real GDP (Chart 1):^{2,3} 1979–81, 1982–86, 1986–90, and 1991–present.

The cycles are particularly evident in the behavior of inflation. While annual RPI inflation since 1979 has averaged 7.8 percent, its standard deviation was 6.5 percentage points, with lows in inflation around 2 percent in 1982 and 1990, and highs of about 20 percent in 1988 and 1994. The lows in general have been associated with sharp slowdowns in real GDP growth. While it averaged 9.8 percent since 1978, real GDP growth fell to 4.4 percent in 1981 and to 3.8 percent in 1990. The most recent cycle stands out, as the

²The cycles have been dated using the growth rate of real GDP, with a cycle assumed to start in the first year of increasing growth and end in the last year of decreasing growth. The exception is 1986, where the turnaround in activity in the middle of the year was taken as the beginning of the third cycle.

³The paper focuses on developments in the RPI, which includes the prices of consumer goods sold at the retail level and reflects overall retail sales. The RPI offers a relatively consistent time series of considerable length, appropriate for a study of inflation over the longer term. A consumer price index (CPI)—also referred to as the cost of living index—is published as well, but a shorter time series is available. The CPI is derived from a consumer survey and reflects a typical consumption basket, including services, which are not covered by the RPI. The RPI and CPI have shown broadly similar movements over the past few years, although the CPI measure of inflation generally has been higher, reflecting the relatively faster-rising prices of services. The weights in the indices are not published, although it is estimated that food items make up about half of both the CPI and the RPI. Services are estimated to make up only about 10 percent of the CPI, reflecting the fact that many service items—such as housing and health care—are not marketed, but are provided through an employee's place of employment.

downturn was accompanied by a sharp reduction in inflation and only a moderate slowing in growth. The "soft landing" implies a smaller sacrifice ratio than in previous cycles.⁴

The cyclical behavior of the macroeconomy raises two interrelated questions. First, what is the source of the recurrent cycles that have characterized the Chinese economy since the initiation of economic reforms? Second, what has determined the behavior of inflation during the cycles, and, in particular, what has facilitated the soft landing in the most recent period?

The first question has been the subject of much debate in the literature.⁵ A number of factors have been associated with cycles, including: (i) periodic surges in fixed investment and other demand components, supported by credit creation; (ii) problems in the state-owned enterprise (SOE) sector, which at times have complicated macroeconomic control; and (iii) structural reforms, including price reform and adjustment.

Naughton (1995), for example, argues that the prime source of macroeconomic imbalances in China has been the government's commitment to maintain very high levels of fixed investment. Since the government itself does not have direct command over the necessary resources, the banking system lends to enterprises through the credit plan, leading to monetary expansion and inflationary pressure. Fan, Hai, and Woo (1996) blame both overconsumption and overinvestment for the recurring periods of overheating. Increasing autonomy of SOEs in the past is argued to have led to excessive wage increases and unbridled investment activity, financed in part by bank lending. Lin (1996) points to the importance of low and sometimes negative real interest rates. When credit controls are relaxed, investment and credit expand strongly, responding to the low real cost of funds.

This paper revisits these arguments against the background of the significant structural changes in China since the onset of reforms. The changing nature of the Chinese economy is expected to have affected the relationships between main economic variables over time and changed the underlying dynamics of growth and inflation. While the paper finds that surges in aggregate demand have played a major role in the cyclical behavior of the macroeconomy, it emphasizes the diversity of economic experience across the cycles. In particular, it is argued that the different nature of the upswing of the fourth cycle—with aggregate demand mainly driven by a surge in investment spending—played a role in facilitating the soft landing. While strong investment demand initially increased aggregate demand more than supply—increasing inflationary pressures—it eventually led to an increase in capacity and potential output. The temporary acceleration of potential output tended to dampen inflationary pressures and added

⁴The sacrifice ratio is defined as the annual real GDP that must be forgone to reduce inflation by 1 percentage point.

⁵See, for example, Fan, Hai, and Woo (1996), Lin (1996), and Naughton (1995).

to a number of other favorable structural and policy factors to allow the economy to settle into a soft landing.

The next section describes the four macroeconomic cycles since 1978, focusing on developments in key economic variables in each episode. The third section discusses the role of aggregate demand and overheating, with particular emphasis on how the last cycle may have differed from the previous ones. The fourth section formalizes the analysis with the help of an econometric study. The fifth section concludes the paper.

II. THE INFLATIONARY CYCLES

A. The First Cycle, 1979–81

Early reforms in the Chinese economy in the late 1970s and early 1980s included administrative price adjustments—which raised a number of plan and above-quota agricultural procurement prices by up to 25 percent—a freeing up of rural trade fairs or “free markets,” and a limited reform in the SOE sector. The reforms also introduced limited price liberalization: enterprises in a few selected industrial and commercial sectors were allowed to sell at prices within a range set by the central authorities, creating a system of “guided” prices (see box).

These reforms led to a sharp increase in aggregate demand as farmers’ income rose markedly and enterprises increased their investment outlays and granted wage increases. The budgetary balance shifted from a small surplus in 1978 to a deficit of 5 percent of GDP in 1979. The swing was a result of higher subsidies—as increases in agricultural procurement prices were not fully passed on to consumers—and a reduction of revenues from SOEs, as firms were no longer required to transfer all their profits to the budget. At the same time, the RPI inflation rate rose from less than 1 percent in 1978 to 6 percent in 1980 (period average) (Chart 1), with the increase largely driven by increases in state administered prices, as free-market prices decreased in 1979 and rose by less than 2 percent in 1980.

The authorities responded to the emerging demand pressures by tightening quantitative credit controls, increasing interest rates, and more selective approval of investment projects. As a result, aggregate demand contracted markedly, and real GDP growth declined to 4.4 percent in 1981. This was well below the growth in potential output—estimated at over

8 percent—opening up a negative output gap of close to 5 percent of GDP.⁶ The inflation rate declined to less than 2 percent in 1982.

B. The Second Cycle, 1982–Early 1986

In the period 1982–84, real GDP growth rebounded sharply—reaching 14.5 percent in 1984—although retail price inflation remained relatively low. While in 1982 and 1983 the prices of a number of commodities were liberalized and the role of guided pricing gradually increased, a large proportion of prices was still set administratively (Chart 2). Important structural reforms during this period included larger autonomy for SOEs in setting wage levels and allocating social funds, the establishment of a two-tier banking system, and some liberalization of the foreign trade and exchange system.

These reform measures, however, were not accompanied by appropriately strong financial policies as the People’s Bank of China (PBC)—only recently established as a central bank—lacked effective tools of monetary policy and encountered difficulties enforcing quantitative credit controls. Enterprises facing soft budget constraints borrowed heavily from the state banks to finance investment and higher wage increases. The total wage bill expanded by almost 45 percent in the last quarter of 1984, while credit accelerated from a 9 percent annualized growth rate at the beginning of the year to 76 percent in the fourth quarter.

By 1985, evidence of overheating was building up. The economic slack that had emerged during the earlier slowdown had been largely eliminated by 1984, and output growth was several percentage points above potential. Imports soared and the trade balance moved into deficit. Strong increases in aggregate demand were driven by soaring investment demand and retail sales (Charts 3 and 4). Reflecting the overheating economy, retail price inflation accelerated from a low of 1 percent (12-month basis) in February 1984 to 10.9 percent in September 1985. The newly liberalized prices under the two-track pricing system rose even faster: the 12-month rate of increase in market prices of consumer goods accelerated to almost 30 percent. Indeed, retail price inflation was driven largely by increases in market prices, made possible by the introduction of the two-track pricing system (Chart 4).

The authorities’ response to the macroeconomic instability was to tighten credit policy, mainly through strengthened control over PBC lending to specialized banks. In addition, the renminbi was devalued and interest rates raised. As a result of the tightening of financial policies, real activity slowed, with the growth in industrial production, retail sales and investment all decreasing by mid-1986. The earlier indicators of an overheating economy

⁶Potential output was estimated using a Hodrick-Prescott (HP) filter, with the smoothing parameter chosen to minimize a global error criterion. The growth in potential output and the associated output gap—defined as the difference between actual and potential output in percentage points—are shown in Chart 1. For a discussion of potential pitfalls of this procedure, see below.

became more benign, as imports decelerated sharply by the second half of 1986 and GDP growth slowed to around potential. The RPI inflation rate responded quickly to the slowdown in economic activity, with the 12-month increase in the RPI and in market prices slowing down to around 3 percent by June of 1986.

Although real GDP growth fell below 10 percent in 1986, a significant slowdown did not develop. Output, on average, remained about 3 percent above potential. Other indications of continued demand pressure persisted as well: the trade balance remained in deficit, and although the growth in real retail sales briefly halted in early 1986, it recovered quickly to around 10 percent until late 1988. The fixed investment to GDP ratio continued to rise in 1986 and 1987.

C. The Third Cycle, Mid-1986-90

The continued strong macro economy was facilitated by an early relaxation of financial policies. The authorities were concerned about the slowdown in economic growth by mid-1986, with reports of developing problems in the SOE sector (Chart 5). Partly in response to the problems in the SOE sector, the authorities eased monetary and credit policies in mid-1986, and accelerated the economic reform process. The scope of the credit plan was temporarily reduced and banks were granted more freedom in setting interest rates. Secondary markets for government securities were created and a regional interbank market emerged.

Economic activity responded quickly to the easing of monetary policy. The growth of real GDP moved back above potential by 1987, widening the positive output gap to 5 percent of GDP. The accommodating financial policies allowed liquidity to expand rapidly. The growth rates of broad money and domestic credit increased to over 30 percent by the first quarter of 1987 (Charts 6). Inflation quickly started to pick up and by late 1987, retail prices were increasing by 9 percent. Free-market prices again outpaced administered prices, rising by over 20 percent. This prompted the authorities to tighten credit policy, and growth in monetary and credit aggregates slowed temporarily in the fourth quarter. As a result, the nature of the expansion changed somewhat, with growth in retail sales and investment slowing. Particularly strong growth in exports continued, however, helping to reduce the trade deficit substantially. The authorities did not keep credit policies restrictive for long: even with credit growth still close to 25 percent, credit policy was relaxed again in early 1988.

Against the background of an economy that was clearly overheating—with output growth above potential, a positive output gap of over 5 percent of GDP, and bottlenecks in key sectors, especially energy, transportation, and raw materials—in April 1988 the authorities implemented major adjustments in a number of administered prices. Prices of pork, vegetables, sugar, and eggs were increased by as much as 60 percent. In addition, further price adjustments were announced for 1989. This led to speculative buying, adding to the strong growth in aggregate demand. Inflation surged, as the 12-month change in the RPI rose to over 25 percent in September, and the 12-month increase in market prices of consumer goods topped 37 percent.

Facing severe macroeconomic imbalance, the government announced a number of measures to restore macroeconomic stability. Credit growth was again reduced sharply, and further price liberalization and administrative price adjustments were postponed. In addition, the provinces' control over administered prices was reduced, as about 50 categories of prices were brought under central government control. Targets were established for increases in locally administered and free-market prices, and local governments were to ensure that production was adequate to prevent prices from rising above target levels.

Reflecting the tight credit policy, the growth rates of M1, M2, and currency slowed sharply. Nominal interest rates were increased and long-term deposit rates indexed to inflation. Guidelines were issued to reduce investment outlays by state-owned units by 20 percent in 1989, and investment indeed fell in 1989. In addition, the authorities imposed tighter administrative controls on imports, and in December 1989, the official exchange rate of the renminbi was devalued.

The adjustment program had immediate effects on economic activity. GDP growth slowed to 4.3 percent in 1989 and industrial production fell (Chart 7). Declining imports and continued brisk export growth—aided by the devaluation—allowed the trade balance to swing into surplus in the first quarter of 1990 (Chart 11). The slowdown in activity in turn had a strong effect on inflation: the 12-month change in the RPI returned to the single digits by October 1989, and free-market prices fell in the year to November. The slowdown in activity prompted the authorities to relax credit policy and price controls somewhat by the last quarter of 1989. Domestic demand remained sluggish throughout 1990, however, and inflation remained low, despite increases in administered prices late in the year and in 1991.

The inflationary peaks in 1985 and 1988 can be seen as part of a longer macroeconomic cycle between 1984 and 1989. The first peak was driven by major price liberalization measures in 1985 combined with an overheating economy, with demand driven by strong retail sales and soaring investment outlays by SOEs facing soft budget constraints. Although inflation came down in 1986 in response to a temporary tightening of credit policies, demand pressures remained. Growth in investment outlays seems to have played less of a role in the upswing of the third cycle, with aggregate demand driven more by retail sales and exports. The strong growth in aggregate demand combined with large adjustments in administered prices led to inflation to accelerate to unprecedented levels in 1988. The authorities' response to the macroeconomic instability was similar to that in the earlier cycles, as monetary and credit policies turned restrictive, investment growth was curtailed sharply, and further price reform was delayed. Economic activity and inflation reacted quickly to the authorities' restrictive policy stance.

D. The Fourth Cycle, 1991–Present

In 1991 and 1992, the authorities took advantage of the relative stability of the overall price level to undertake major price reforms. In agriculture, the coverage of administered pricing was reduced, administered prices were raised toward market levels, and regional and

national wholesale markets for key commodities were created. In industry, a major price liberalization reduced the proportion of producer goods sold at state-determined prices from nearly half in 1990 to 20 percent by the end of 1992, while the prices of oil, coal and natural gas were increased. At the retail level, coverage of price controls was reduced significantly as well. Other structural reform was stepped up, as SOE reform was resumed, special economic zones were extended to inland regions, foreign exchange rules were relaxed, more commercial banks were licensed, and experiments with limited liability and joint stock companies were initiated.

During 1992 and 1993, credit growth accelerated, fueling an investment boom in which fixed investment by SOEs grew by close to 70 percent in the first quarter of 1993. The strong growth in investment brought the ratio of fixed investment to GDP to 37.5 percent in 1993 (Chart 12). Real GDP expanded strongly in 1992 and 1993, supported by large increases in industrial production. The economic slack was quickly taken up and demand pressures emerged. Inflation reached 6 percent in the year to April 1992, fueled by a 11 percent increase in (mostly administered) food prices. Market price increases remained subdued, however, and actually fell in June and July.

In early 1993 overall retail price inflation started to accelerate rapidly, and by the middle of the year the authorities implemented a "16-point" program to cool the economy. The measures included raising interest rates, tightening PBC credit to banks and cracking down on loans made outside of the credit plan, including through the interbank market. The monetary and credit squeeze that followed the implementation of the adjustment program mainly fell on SOEs, prompting call for a relaxation of policies. The authorities responded in late 1993, temporarily reversing the slowdown in money and credit growth.

While the growth in real retail sales remained moderate through 1993 and 1994, strong export growth again appeared later in the cycle: the devaluation that accompanied the unification of the exchange rate in early 1994 and changes to the VAT rebate for exports helped boost export growth to 60 percent by the first quarter of 1995. As a result, the trade balance swung into surplus, and foreign exchange reserves rose strongly throughout 1994, helping to fuel brisk growth in monetary aggregates. In addition, foreign direct investment (FDI) picked up strongly.

The adjustment program failed to contain inflation immediately, with retail prices in October 1994 over 25 percent higher than 12 months earlier. Starting in late 1994, however, the economy began to cool gradually. Over the next two years, inflation came down significantly, to under 5 percent in December 1996, as the growth rate of real GDP moderated toward potential. Investment growth moderated, although the investment-to-GDP ratio declined only slightly and remained well above the levels in previous cycles.

Inflation in the fourth cycle was very pronounced in food prices, which rose strongly in the wake of a 40 percent increase in grain procurement prices in 1994 (Chart 10). While the 12-month rate of increase in nonfood prices responded to the tightening of financial policies

quickly and started to decline as early as mid-1993, food prices and the overall RPI index continued to accelerate until late 1994. Subsequently, food prices slowed sharply, partly as a result of policies undertaken to improve food production and increase food imports.

The fourth cycle is notable for achieving a sharp reduction in inflation with only a modest slowdown of growth. The factors behind the soft landing are examined in the next section, in the context of the broader question of the determinants of the macroeconomic cycles in China.

III. DETERMINANTS OF MACROECONOMIC CYCLES IN CHINA

A. The Role of Aggregate Demand and Overheating

China's macroeconomic cycles have largely been driven by sharp increases in aggregate demand. The previous section identified for each cycle a component—or components—of aggregate demand that drove the economy forward, eventually leading to overheating. Chart 1 shows the close relationship between the estimated output gap and inflation. It demonstrates that periods with output above potential tend to be associated with rising inflation and those with output below potential are associated with falling inflation, in a pattern familiar from the Phillips curve:^{7,8}

$$\pi_t - \pi_t^e = \alpha + \sum_{i=0}^v \beta_i GAP_{t-i} + \epsilon, \quad (1)$$

where

$$GAP_t = \frac{y_t - y_t^{POT}}{y_t^{POT}} \quad (2)$$

and π is actual inflation, π^e is expected inflation, y is actual output, and y^{POT} is potential output. The Philips curve model of inflation predicts that prices will rise faster than expected when output is above potential and less than expected when the output is below potential. When output is at potential, inflation equals expected inflation. The model predicts that, given the output gap, a fall in inflationary expectations leads to a commensurate fall in actual inflation.

⁷The Phillips curve, expressed here as a relationship between inflation and the output gap, can also be applied to wage inflation, in which case the “gap” is between the actual rate of unemployment and the natural rate of unemployment, or NAIRU.

⁸Coe and McDermott (1997) test the model of equation (1) econometrically for a number of Asian economies, and find that Chinese data do not appear to fit the model, most likely as a result of data limitations. Section IV will return to this issue.

In the model of equation (1) the cost of disinflation is influenced importantly by inflationary expectations. For example, with forward-looking rational expectations, a credible disinflationary program that eliminates excess demand could reduce inflation quickly. As a result, the sacrifice ratio would be relatively low. In practice, however, with nominal rigidities and backward-looking inflationary expectations, the sacrifice ratio may be higher. For example, under the assumption of adaptive expectations, where $\pi_t^e = \pi_{t-1}$, equation (1) becomes:

$$\Delta\pi_t = \alpha + \sum_{i=0}^v \beta_i GAP_{t-i} + \epsilon, \quad (3)$$

and an economy would have to go beyond merely closing the output gap to reduce inflation: in fact, a **negative output gap**—or some economic slack—would be necessary for a period of time, implying a more substantial sacrifice ratio. In many countries, where backward-looking indexation, downward rigidity of nominal wages, minimum-wage laws, bargaining structures, and other labor–market institutions and regulations introduce significant inertia in the inflation process, the economy tends to respond according to an equation such as equation (3).⁹

The soft landing of the fourth cycle is evidence of a potentially low sacrifice ratio in China: disinflation from a monthly high of over 25 percent to 4.7 percent in 24 months was achieved with growth remaining above its long term average of 9.7 percent. There are two main factors in China that may have helped to keep the cost of disinflation relatively low. First, the labor market generates relatively little inflation inertia. Official nominal wage indexation does not exist, and in the state–owned sector a part of compensation is in the form of goods and services. The latter in effect indexes wages contemporaneously and avoids the backward indexation that leads to inflation inertia. Also, the labor market for the growing nonstate sector has remained relatively unregulated, and unrestrained by labor unions, collective bargaining, and employment protection provisions. Second, inflation expectations have remained relatively flexible. China does not have a history of prolonged high inflation, and the inflation peaks that have occurred have tended to be short lived with disinflation achieved rapidly. In addition, the Chinese authorities have tended to prioritize inflation reduction in a way to effectively affect the public’s inflationary expectations.

B. The Soft Landing: How did the Fourth Cycle Differ?

Even taking these positive factors into account, however, the reduction in inflation in the fourth cycle stands out, apparently having been achieved even more rapidly than the model of equation (1) would predict. Chart 1 shows that not only did inflation come down from its high in 1994 in a soft landing, it did so in the face of apparently persistent positive excess demand.

⁹If inflationary expectations depend on a distributed lag of past inflation rates, equation (3) would have a more complicated lag structure.

The different nature of the upswing of the fourth cycle suggests, however, that the dynamics of the fourth cycle may be consistent with the Phillips curve model of equation (1). The fourth cycle differs from earlier cycles mainly in that aggregate demand in the upswing was driven largely by fixed investment. This is potentially important, since fixed investment affects both the demand and the supply sides of the economy.¹⁰ While investment spending initially increases aggregate demand more than supply—which would tend to increase inflationary pressures—it eventually leads to an increase in capacity and potential output—which would tend to reduce inflationary pressures. Thus, despite doubts about the efficiency of some of the investment projects undertaken, the likely result of the surge in fixed investment in China starting in 1993 was a significant increase in the capital stock, and—taking into account the large pool of excess labor both in SOEs and in the agricultural sector—a temporary increase in the growth rate of potential GDP. Rapid growth in potential GDP may thus have allowed the economy to settle into a soft landing within the dynamics of the Phillips curve: despite continued strong actual real GDP growth, an acceleration in potential GDP allowed the output gap to close and inflation to fall quickly.

The role of potential GDP in the soft landing is however difficult to identify in the data. In Chart 1, the measured output gap persists throughout the fourth cycle, even as inflation declines rapidly. However, the estimate of potential GDP growth used in the chart are based on the Hodrick-Prescott filter which might not detect a sharp change in the level of potential output due to a surge in investment. The reason is that the filter does not measure potential output directly—as a measurement of capital and labor input growth might, for example—but rather as an average of actual output, smoothing out booms and recessions. The filter would therefore not immediately show an increase in potential output if actual output growth does not increase initially—as is the case in a scenario where the increase in capacity serves to close the positive output gap. The increase in potential output would translate in lower inflation, not an increase in actual output, and the HP filter would not register an increase in potential output. Thus, while Chart 1 shows a persisting positive output gap as inflation fell sharply in the second half of the fourth cycle, it is possible that potential output growth was temporarily higher than measured by the HP filter and that the output gap in reality behaved differently, explaining the rapid fall in inflation.

¹⁰This is one aspect of a more general problem with the measurement of the output gap. Any shock that affects the demand side of the economy could affect the supply side as well, rendering the effect on the output gap and inflation ambiguous. This problem is especially relevant in an economy like China, where structural reform measures may have a wide-ranging impact.

There is some evidence of rapid capacity growth in recent years. Estimates of the Chinese capital stock based on Hu and Khan (1997)¹¹ (Chart 11) imply an acceleration of the growth of the capital stock starting in 1993. As a result, the negative “capital gap”—defined as the percent difference between the actual capital stock and its long-term trend—closes quickly. By 1995, the actual capital stock is above its long-run trend. Other data tend to suggest a degree of slack in the economy, with low rates of capacity utilization reported in several sectors in the past two years, but the trend is far from clear.

Although the strong increase in fixed investment in the fourth cycle may have facilitated the recent decline in inflation through its effect on capacity, the main short-run macroeconomic impact of investment spending continues to be through its effect on aggregate demand. The fixed investment boom was a major source of excess demand contributing to the economic imbalance of 1993–94. While fixed investment remains important for the long-term buildup of China’s productive capacity, excessively rapid increases are a potential source of macroeconomic instability. Continued appropriate restraint in fixed investment spending remains of major importance in sustaining the recent strong macroeconomic performance and avoiding a return to the cyclical pattern of the past.

A number of other factors are widely believed to have facilitated the soft landing. These include:

- the improving structure of the Chinese economy, with the more dynamic nonstate sector accounting for a larger share of GDP;
- a more gradual tightening of economic policies, notably investment approvals and monetary policy;
- greater attention to the composition and efficiency of investment;
- the implementation of structural reforms to increase the market orientation and openness of the economy; and
- a record grain harvest in 1996 which allowed a rapid deceleration of food prices.

¹¹Hu and Khan's time series ends in 1994; the estimates for 1995 and 1996 were derived using the method described in their paper. The trend capital stock was derived using the Hodrick-Prescott filter.

C. Other Factors Associated with the Cycles

The reform process and economic policy

An important feature of the Chinese economy in the past two decades has been the intensity of the cycles, and their relatively rapid succession. It has been suggested that China's transition from central planning to a market economy has complicated economic management, and might affect economic activity in ways beyond the traditional macroeconomic relationships. For example, a factor cited as contributing to the recurrence of macroeconomic cycles is the health of the SOE sector. A tightening of credit policy to cool off the economy and combat inflation tends to negatively affect state-owned units, which might encourage the authorities to prematurely relax their anti-inflationary stance. This would stimulate the economy before all demand pressures have been purged, extending the situation of overheating and rekindling inflation.

The health of the SOE sector has softened since 1978, with particular weakness in the past few years (Chart 7). Profits have declined and the number of loss-making enterprises has increased markedly, especially during downturns in economic activity. The data are consistent with anecdotal evidence that in years of restrictive financial policies, such as 1986 and 1989, the SOE sector was negatively affected.

China's reform process also introduces problems of consistency in the macroeconomic policy framework. The main tools of macroeconomic policy continue to be investment approvals and the credit plan, but beyond that other policy instruments have taken on importance, such as the exchange rate and interest rates, as the authorities shift toward indirect tools of economic management. Possible inconsistencies between these various tools of economic policy are not always immediately apparent, and pursuing various targets simultaneously might lead to undesirable macroeconomic results.

Price reform

One of the transition issues that could affect macroeconomic performance is price reform. Both adjustments in administered prices and price liberalization have directly influenced inflation, aggregate demand, and growth.

Chart 2 shows the proportion of retail sales at market prices and general trends in price liberalization. For comparison, the end-of-period change in the RPI has been included, suggesting some coincidence between price liberalization and inflation. Adjustments in administered prices—the second aspect of price reform—are discrete events whose effect on inflation could in principle be calculated directly, but data limitations preclude such a detailed analysis. Instead, Chart 4 contrasts increases in the overall retail price level and increases in market prices, and complements the anecdotal evidence to provide a basis for rough inferences about the effects of changes in administered prices. For example, the decreases in market prices in the early 1990s suggest that the overall positive inflation rate was driven

mainly by adjustments in administered prices. One could go further and combine the data in Chart 4 with those in Chart 2 to suggest that retail price inflation in 1985 was mostly driven by increases in market prices.¹²

Price reform can indirectly impact the economic cycle as well. In April 1988, for example, the authorities raised the administered retail prices of a number of agricultural commodities substantially, and additional price adjustments were announced for later that year and for early 1989. The announcement led to a spree of panic buying that added to the already substantial demand pressures in the economy, contributing significantly to the intensity of macroeconomic imbalances.

IV. STATISTICAL ANALYSIS OF THE INFLATIONARY PROCESS

This section offers a formal econometric analysis of the macroeconomic cycles, focusing mainly on inflation. The analysis takes a two-pronged approach. First, it examines the nature of the inflationary process by estimating the model of equation (3) with yearly data over the period 1980 to 1996.¹³ The results show that with a long time series and inclusion of capacity effects, Chinese data conform to the Phillips curve model quite well. In addition, the results offer confirmation of a possible role for increases in capacity in facilitating the soft landing in the fourth cycle.

In a second exercise, quarterly data are used to regress inflation on various demand components, to assess their role in the economic cycles. The results show the shift in importance from consumption as a driving factor in aggregate demand in the third cycle toward fixed investment in the fourth cycle.

A. The Role of Excess Demand

Coe and McDermott (1997) estimated an equation similar to (3) above for 13 Asian countries, and found that the output gap plays a significant role in the inflation process in most countries in Asia, with two notable exceptions: China and Thailand. With respect to China, the authors indicated that the failure of the model may be due to the inclusion of data from the pre-reform period before 1978, when prices were generally not market-determined.

¹²Taking into account the share of retail sales conducted at free-market prices in 1985—34 percent—a simple calculation using a weighted average implies a rise in administratively set and guided prices of around 2 percent.

¹³Ideally, the exercise would examine equation (1) directly, but since no information is available on inflationary expectations, the simplifying assumption of adaptive expectations will be employed.

Table 1 shows the results of an estimation of equation (3) over the period 1980–96. A specification including the contemporaneous value and the first lag of the output gap was used.¹⁴ Although the sign of the lagged variable was negative, the sum of the coefficients was positive, and significantly different from zero. Thus, aggregate demand appears important in the inflationary process: inflation rises in response to excess demand, and falls in response to economic slack. The equation fits less well in the last cycle, however.

It was suggested earlier that in the most recent cycle fixed investment may have had an independent effect on inflation through its impact on the capital stock and potential output. To test this hypothesis, regression 2 in Table 1 adds the capital gap—the percent excess of the capital stock over its long-term trend—to the analysis. Various combinations of lags of the capital gap were examined, again using the Schwarz criterion to choose the optimal lag length. The results indicate that the sum of the contemporaneous value and the first lag of the capital gap have a strong and significant **negative** effect on inflation. Thus, if the capital stock rises above its long-term trend, inflation falls. This finding is consistent with the possibility referred to earlier, where the strong increase in investment in the early part of the fourth cycle led to a rapid expansion of capacity that facilitated the moderation in inflation later in the cycle.

B. Components of Excess Demand

For a number of components of aggregate demand—fixed investment, retail sales, and exports—higher frequency data covering at least a decade are available. This makes it possible to conduct a more detailed econometric analysis of the importance of different demand components in the cycles. Specifically, the output gap in equation (3) can be replaced by similar “gap” variables representing the components of aggregate demand:

$$\Delta\pi_t = \alpha + \sum_{i=0}^v (\beta_i IGAP_{t-i} + \gamma_i RSGAP_{t-i} + \delta_i EXGAP_{t-i}) + \epsilon. \quad (4)$$

The variables *IGAP*, *RSGAP*, and *EXGAP*—representing the investment gap, the retail sales gap, and the export gap, respectively—were calculated using the same procedure that was used to obtain the output gap and the capital gap. In effect, equation (4) represents the “demand-side” counterpart to equation (3), with the output gap—a supply-related variable—replaced by components of aggregate demand.

The results in the lower panel of Table 2 show that the retail sales gap had a strong positive effect on the change in inflation in both cycles: inflation tended to increase when retail sales were above trend and fall when retail sales were below trend. In addition, in the fourth cycle, the investment gap had a strong positive effect on inflation, so that inflation tended to increase when investment was above trend, and fall when it was below trend. No significant

¹⁴As in Coe and McDermott, the Schwarz criterion was used to determine the number of lags on the output gap as an explanatory variable.

effect of investment on inflation in the third cycle was found, and in neither cycle did the export gap affect inflation in a statistically significant way.

V. CONCLUSION

The analysis in this paper has found that the macroeconomic cycles have largely reflected surges in aggregate demand. Despite this general finding, however, the main feature of the cycles has been their diversity. Table 3 summarizes the cycles' characteristics. It shows that the factors behind the upswings and the importance of different demand components have tended to change over time. This is not surprising given the substantial structural changes that have taken place in the Chinese economy since the onset of reform.

Reflecting the variety of structural and policy elements underlying the cycles, the downturns have differed substantially as well. The first and third cycles ended in recession, while the second downturn was short-lived, quickly giving way to the upswing of the third cycle. The soft landing of fourth cycle stands out, and although it would be compelling to try to identify one single aspect of the cycle, it is most likely that the favorable outcome was the result of a combination of factors.

Possible factors accounting for the soft landing during the most recent cycle include: (i) favorable developments in agriculture, including a record grain harvest; (ii) the improving structure of the Chinese economy, with the relative more dynamic nonstate sector accounting for a larger share of GDP; (iii) the authorities' firm commitment to macroeconomic stability and the more gradual tightening of economic policies, notably investment approvals and monetary policy; (iv) greater attention to the composition and efficiency of investment; (v) the implementation of structural reforms to increase the market orientation and openness of the economy; and (vi) rapid growth of fixed investment in the upswing of the cycle, which led to rapid growth of capacity, facilitating the decline in inflation.

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Box. Price reform in China

Under the central-planning framework that existed in China until the late 1970s, the prices of almost all goods were administratively set by the central or provincial authorities. These prices therefore did not reflect relative scarcities nor international price levels, but rather were obtained using a cost plus approach, with adjustments for considerations of income distribution or revenue mobilization, leading to a significant degree of distortion in relative prices. In addition, administered prices were adjusted only infrequently. A small proportion of transactions in the economy were conducted at market-related prices: in 1978, 3 percent of total retail sales were conducted at free-market prices, while 97 percent of retail sales were conducted at state-determined fixed prices.

Price reform since 1979 has consisted of two parallel developments: the **adjustment of administered prices** and **price liberalization**. In the early years, much of price reform came in the form of adjustments in administered prices, including agricultural procurement prices. Price liberalization took place on a limited scale initially. By 1983, for example, the proportion of agricultural goods sold at market prices was only 10.5 percent. An additional 18.4 percent of agricultural output was sold at "guided prices" which were subject to a government-determined maximum and/or minimum.

Price liberalization took on importance when, by the mid-1980s, the authorities introduced a two-tier pricing system for a number of sectors. Under the new procurement system for agricultural products, the government purchased part of agricultural output at a fixed price and allowed the above-quota output to be sold at market-related prices. The system was soon extended to a number of industrial commodities and means of production: while plan prices prevailed for key industries and for production within the state-determined quotas, production in excess of quota could be sold in the free market. For a significant portion of total sales, however, guided pricing persisted, so that, in effect, the two-track system had three sets of prices: (i) prices fixed by the state; (ii) guided prices, for which the state authorities determined a range; (iii) free-market prices. "Free-market" prices are not always fully market-determined, and there have been varying levels of official intervention in the form of price management and indirect controls. Introduction of the two-track pricing system led to a rapid increase in the proportion of goods sold at market prices. In 1985, 34 percent of retail sales took place at free-market prices, while 19 percent was subject to price guidance (Chart 2). And by 1986, the proportion of goods sold at fixed prices had fallen below 35 percent. Similarly, in agriculture the proportion of output sold at fixed prices fell from 68 percent in 1984 to 37 percent in 1985 (Chart 3).

A temporary setback in the drive toward price liberalization came in the late 1980s, when the authorities—in response to emerging macroeconomic imbalances—adopted a "Rectification" program, which included a partial reversal of earlier price reform, as the prices of a number of important commodities were brought back under direct central government control. These measures are reflected in Chart 2 as a reversal of the trend toward liberalization. The slowdown in economic activity and the declining inflation rate in 1989 and 1990 initially led to a limited relaxation of these controls, and in the following years price reform was stepped up. In agriculture, this took the form of reducing the coverage of administered pricing, raising administered prices toward market levels, and creating regional and national wholesale markets for key commodities. By 1993, the proportion of agricultural output sold at market-related prices increased to almost 90 percent. In industry, a major price liberalization reduced the proportion of producer good sold at state-determined prices from nearly half in 1990 to 20 percent at the end of 1992.

Despite the rapid price liberalization in 1991–1993, the apparatus for directly controlling prices remained intact, and surging inflation in 1994 led to an intensification of price surveillance, the establishment of benchmark prices for key commodities, increased price subsidies, and some postponement of planned administered price increases. The system today remains largely liberalized, however. The great majority of transactions in the economy takes place at market-determined prices and the authorities estimate that the share of government-regulated prices in retail sales is commensurate with levels in advanced economies.

Table 1. China—Inflation Equation Estimates, Yearly Data, 1980–96

Dependent variable: change in RPI inflation										
Regression	Constant	Output gap coefficients				Capital gap coefficients				Adjusted R squared
		lags	sum	signs	F-test	lags	sum	signs	F-test	
1.	0.51 (1.06)	0,1	0.414	+-	185.4*					0.40
2.	0.92 (0.62)	0,1	1.491	+-	17.6*	0,1	-0.629	-+	10.03*	0.46

Note: Standard errors in parentheses.

* Denotes F-test rejects null of the sum of coefficients being zero simultaneously at 5 percent confidence level.

Table 2. China—Inflation Equation Estimates, Quarterly Data, 1986QIII–1996QIII

Dependent variable: change in RPI inflation					
Variables	Lags	Coefficients		F-test	Adjusted R ²
		sum	signs		
A. Third cycle, 1986QIII–1990QIII					
	0,1,2,3				0.99
Investment gap		0.427	++++	5.21	
Retail sales gap		0.997	++++	40.4*	
Export gap		0.281	++++	5.82	
B. Fourth cycle, 1990QIV–1996QIV					
	0,1,2,3,4				0.92
Investment gap		1.610	+++++	8.31*	
Retail sales gap		2.903	+++++	5.23*	
Export gap		-0.296	++---	1.94	

Note: * Denotes F-test rejects null of all coefficients being zero simultaneously at 5 percent confidence level.

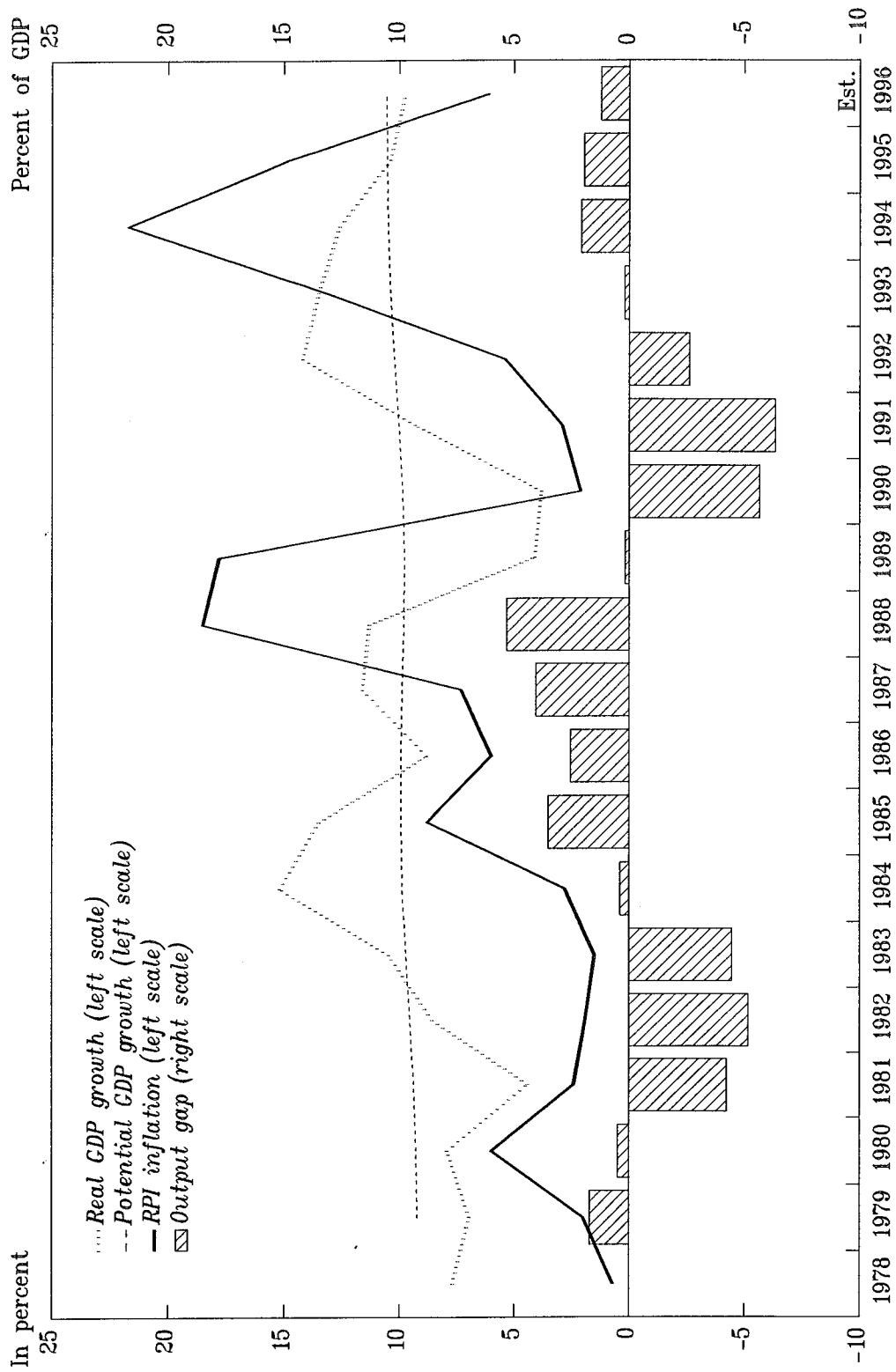
Table 3. Main Attributes of the Four Macroeconomic Cycles

Cycle	Aggregate demand dominated by	Possible cause	Main components of inflation	Policy response	Landing
1979-81	retail sales	increases in rural incomes as a result of agricultural reform	adjustments to administered prices	financial policies tightened; investment curtailed	hard
1982-86	retail sales; fixed investment	soft budget constraints of SOEs leading to excessive investment and wage increases financed by credit creation	price liberalization; increases in free-market prices	credit policy tightened temporarily; interest rates increased	soft, but short lived
1986-90	retail sales; exports	early relaxation of financial policies in response to concerns about problems in the SOE sector; panic buying in response to administered price increases	price liberalization; adjustments to administered prices	monetary and credit policy tightened; investment reduced sharply; price reform suspended and partially reversed	hard
1991-present	fixed investment; retail sales; exports	investment push by central and local authorities	increases in food prices, including administered price increases	monetary and credit policy tightened; investment growth gradually lowered; structural reform continued	soft

CHART 1

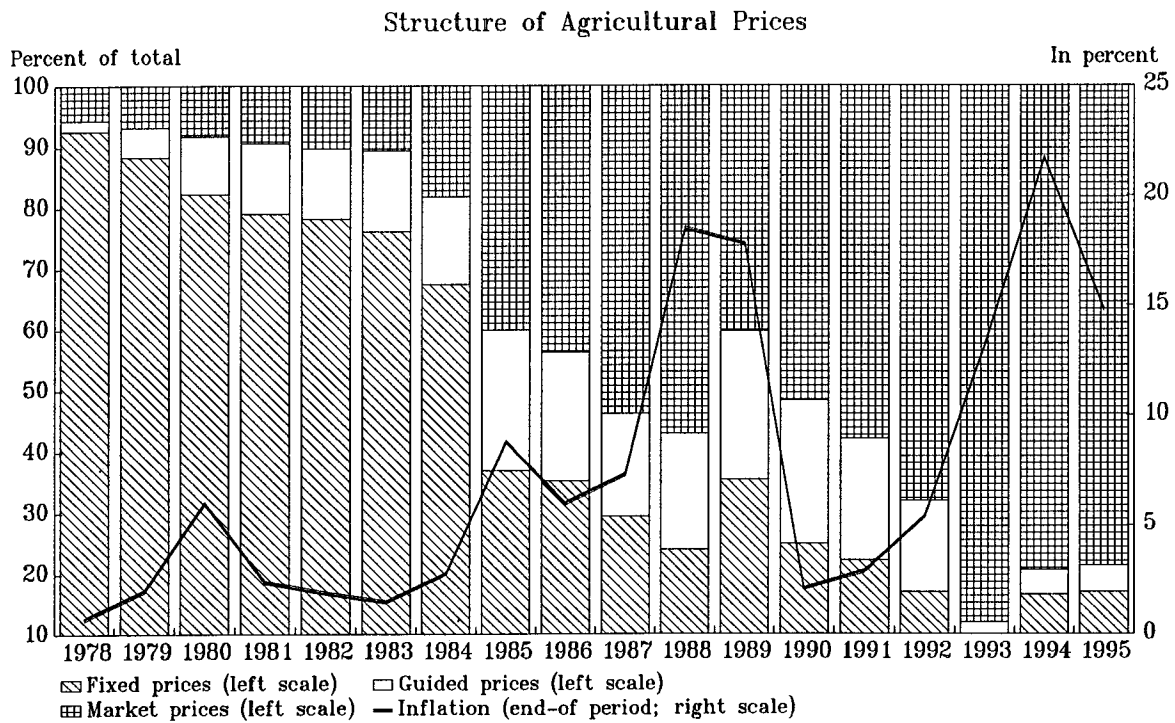
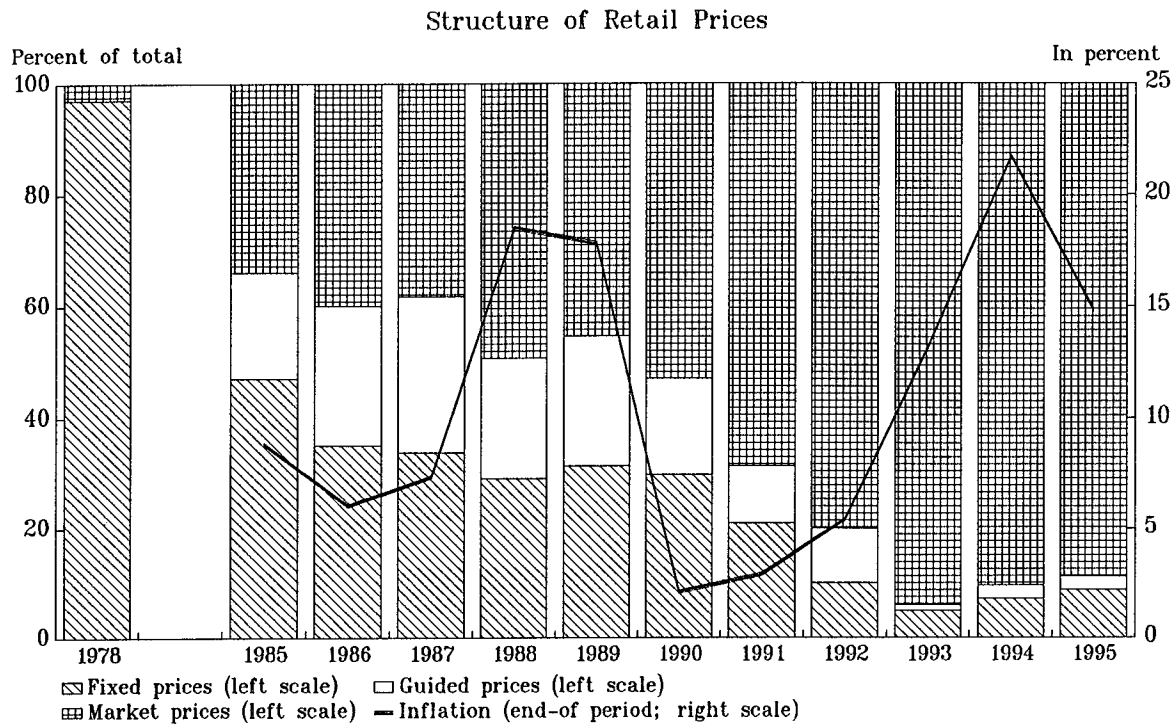
CHINA

GDP GROWTH AND INFLATION



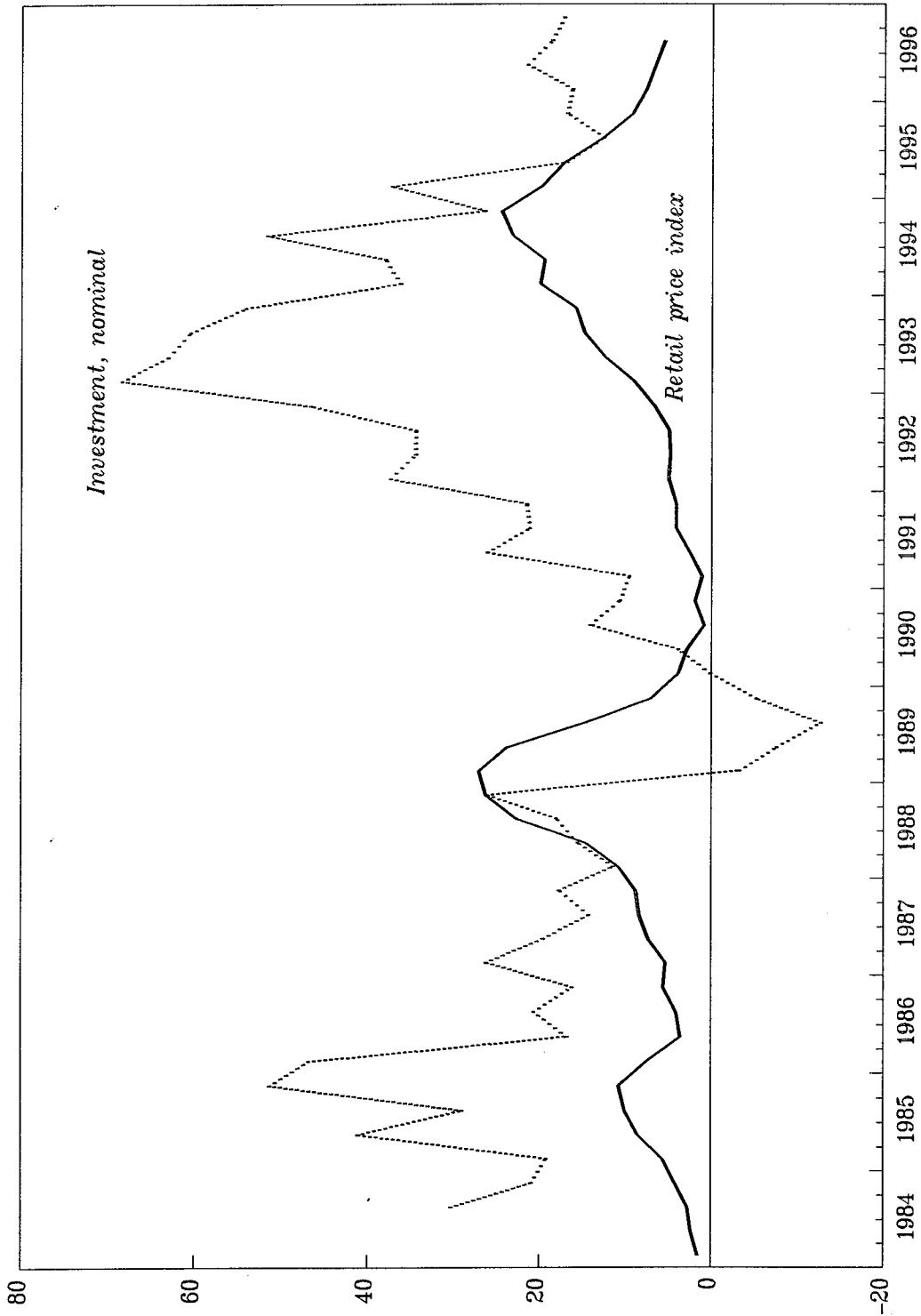
Sources: State Statistical Bureau, and Fund staff estimates.

CHINA
STRUCTURE OF RETAIL AND AGRICULTURAL PRICES



Source: State Statistical Bureau.

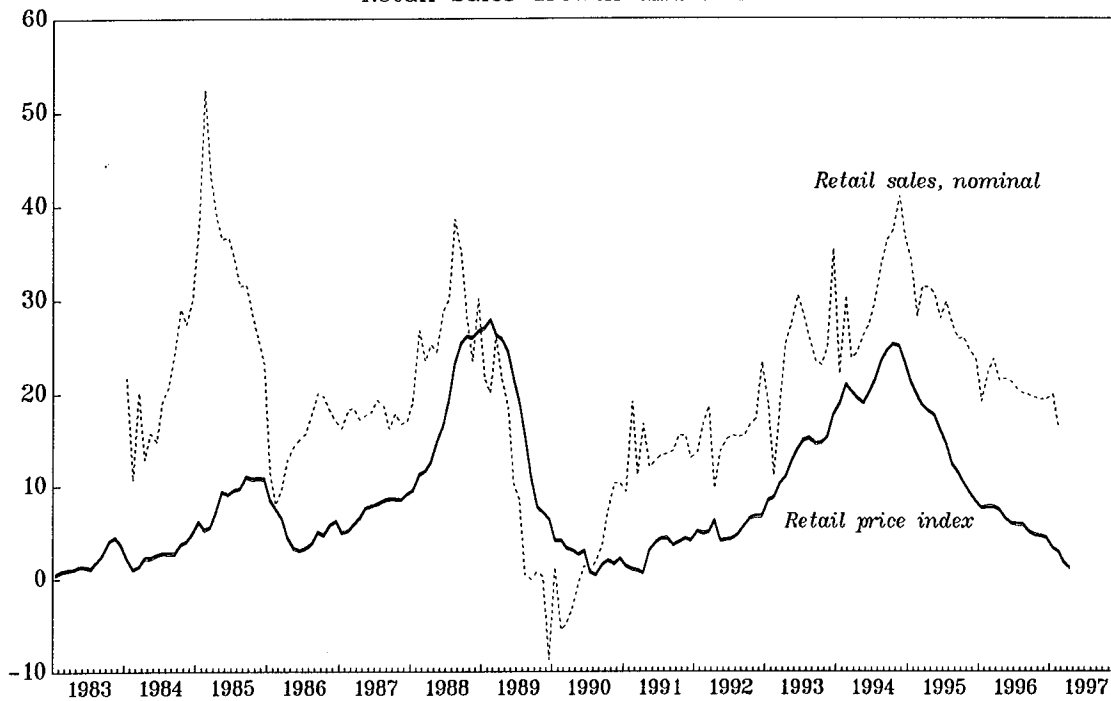
CHART 3
CHINA
FIXED INVESTMENT BY STATE OWNED UNITS
(Twelve-month change; in percent)



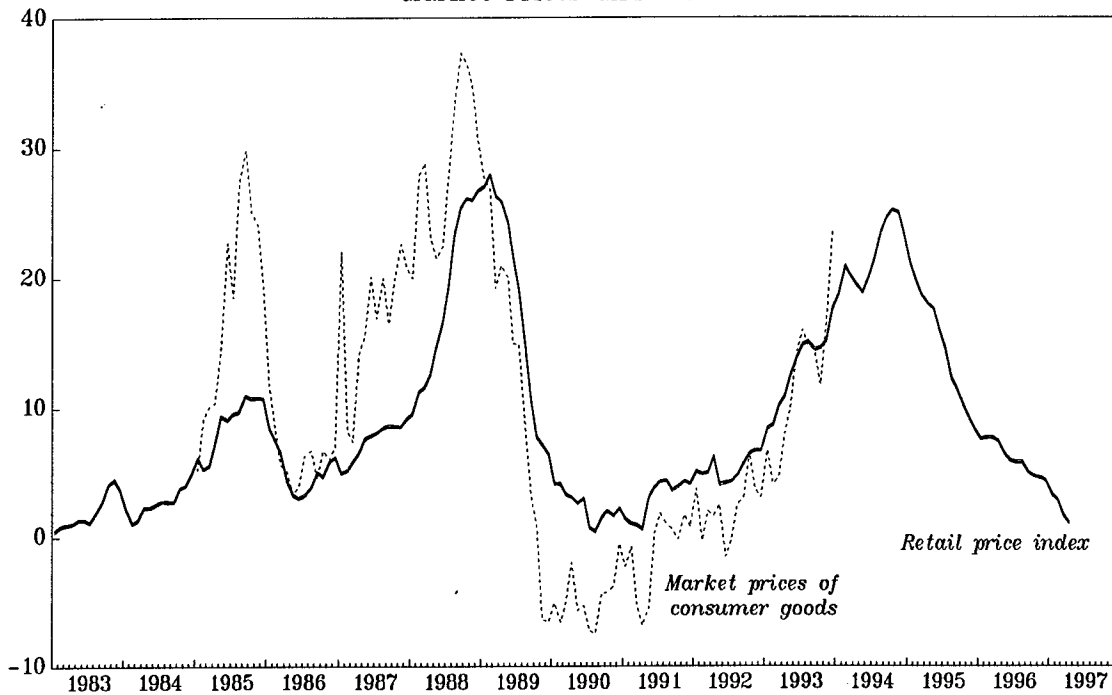
Source: State Statistical Bureau.

CHINA
RETAIL SALES, MARKET PRICES AND INFLATION
(Twelve-month change; in percent)

Retail Sales Growth and Inflation

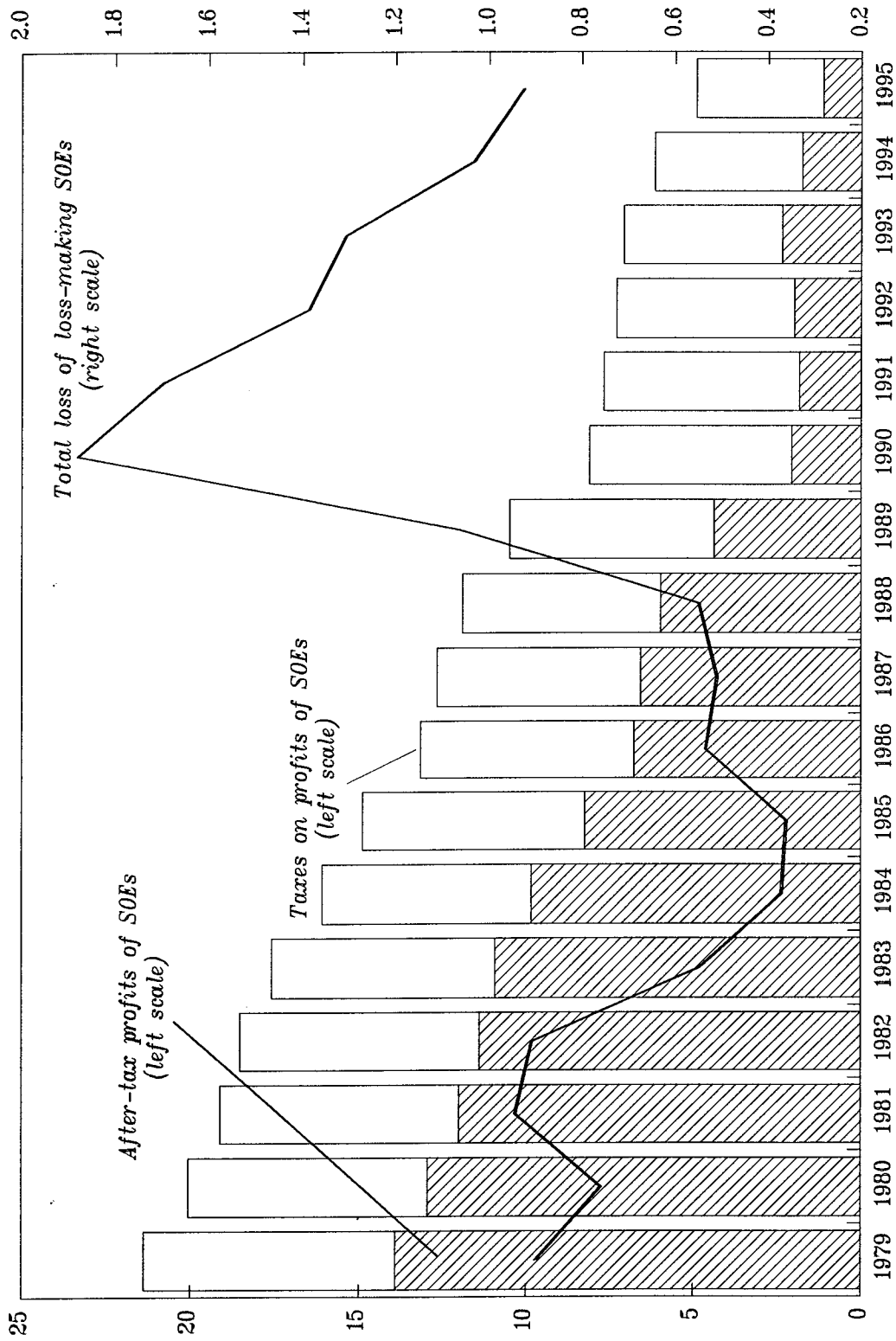


Market Prices and Inflation



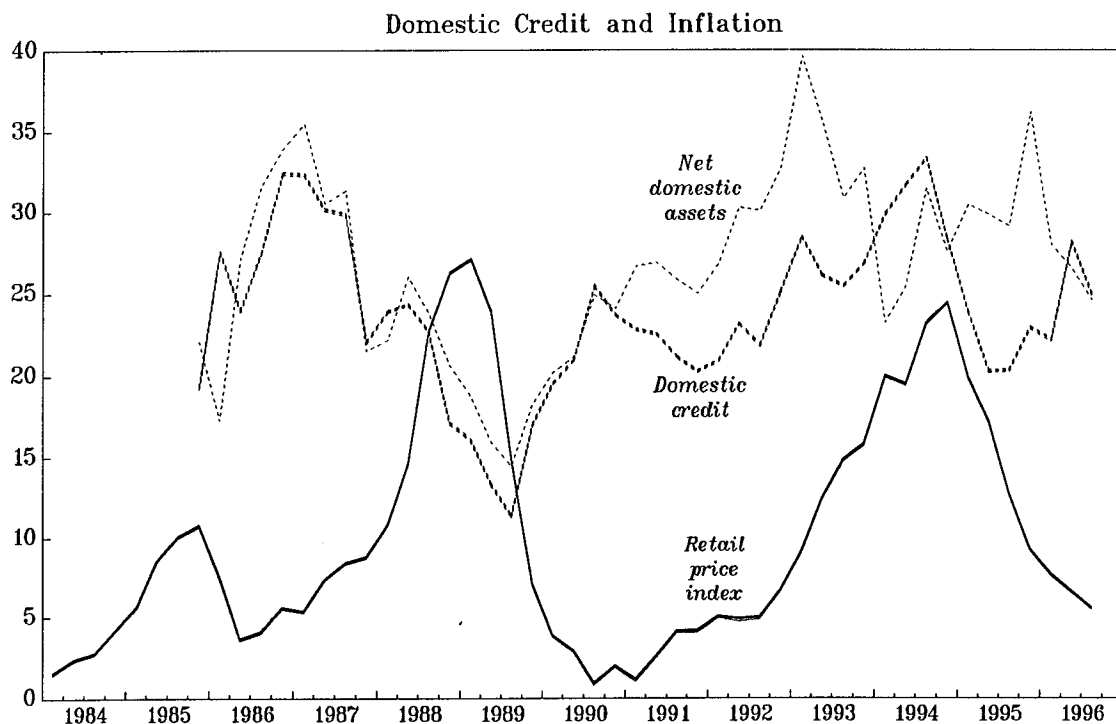
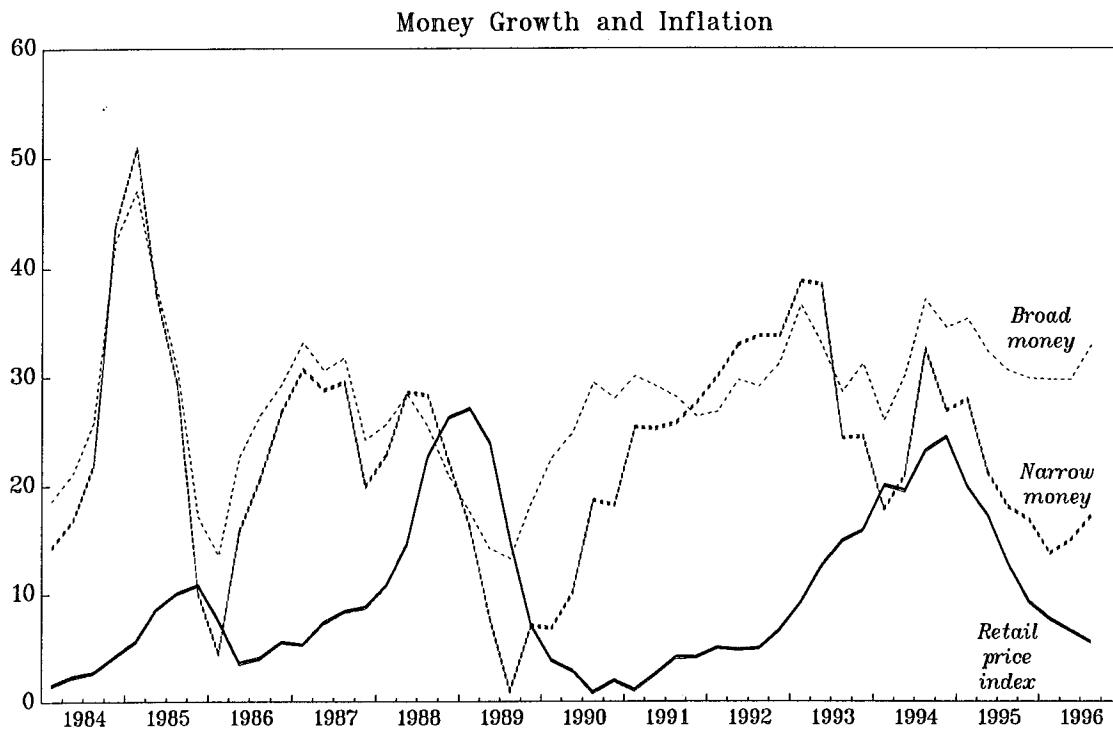
Source: State Statistical Bureau.

CHART 5
CHINA
PROFITS AND LOSSES OF SOEs
(In percent of GDP)



Source: State Statistical Bureau.

CHART 6
CHINA
MONEY, DOMESTIC CREDIT AND INFLATION
(Twelve-month change; in percent)



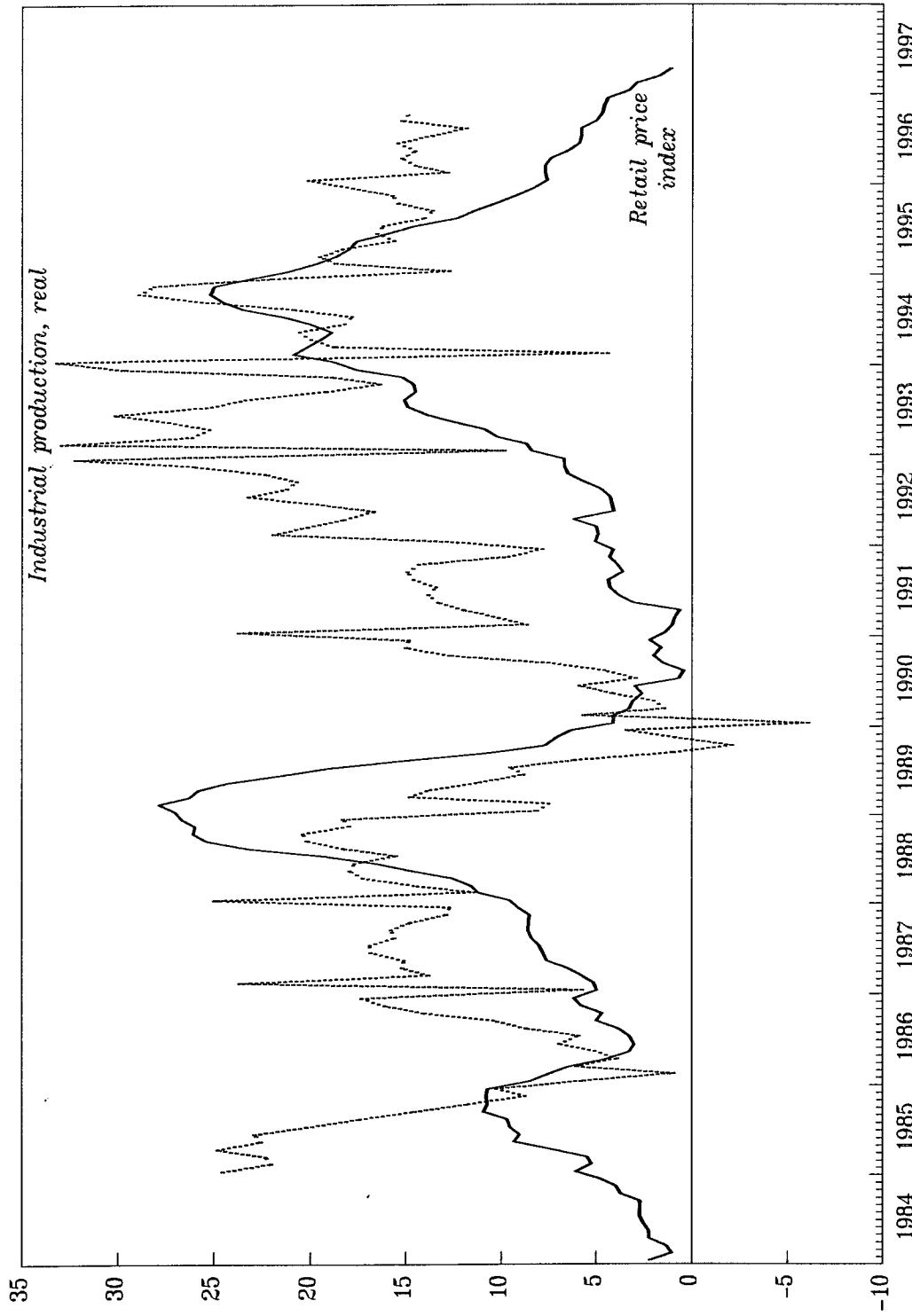
Source: People's Bank of China.

CHART 7

CHINA

INDUSTRIAL PRODUCTION AND INFLATION

(Twelve-month change; in percent)

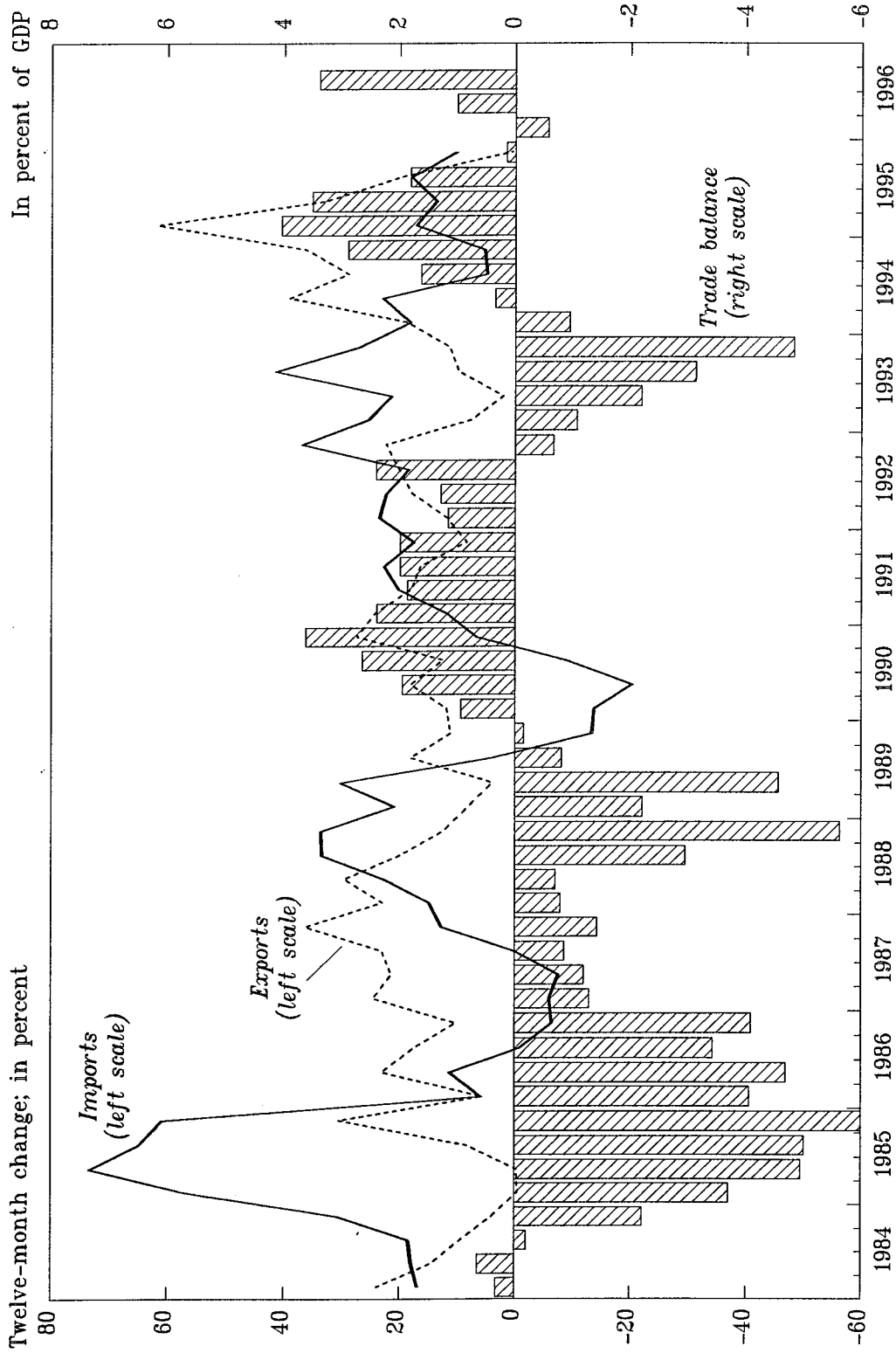


Source: State Statistical Bureau.

CHART 8

CHINA

IMPORTS, EXPORTS AND TRADE BALANCE

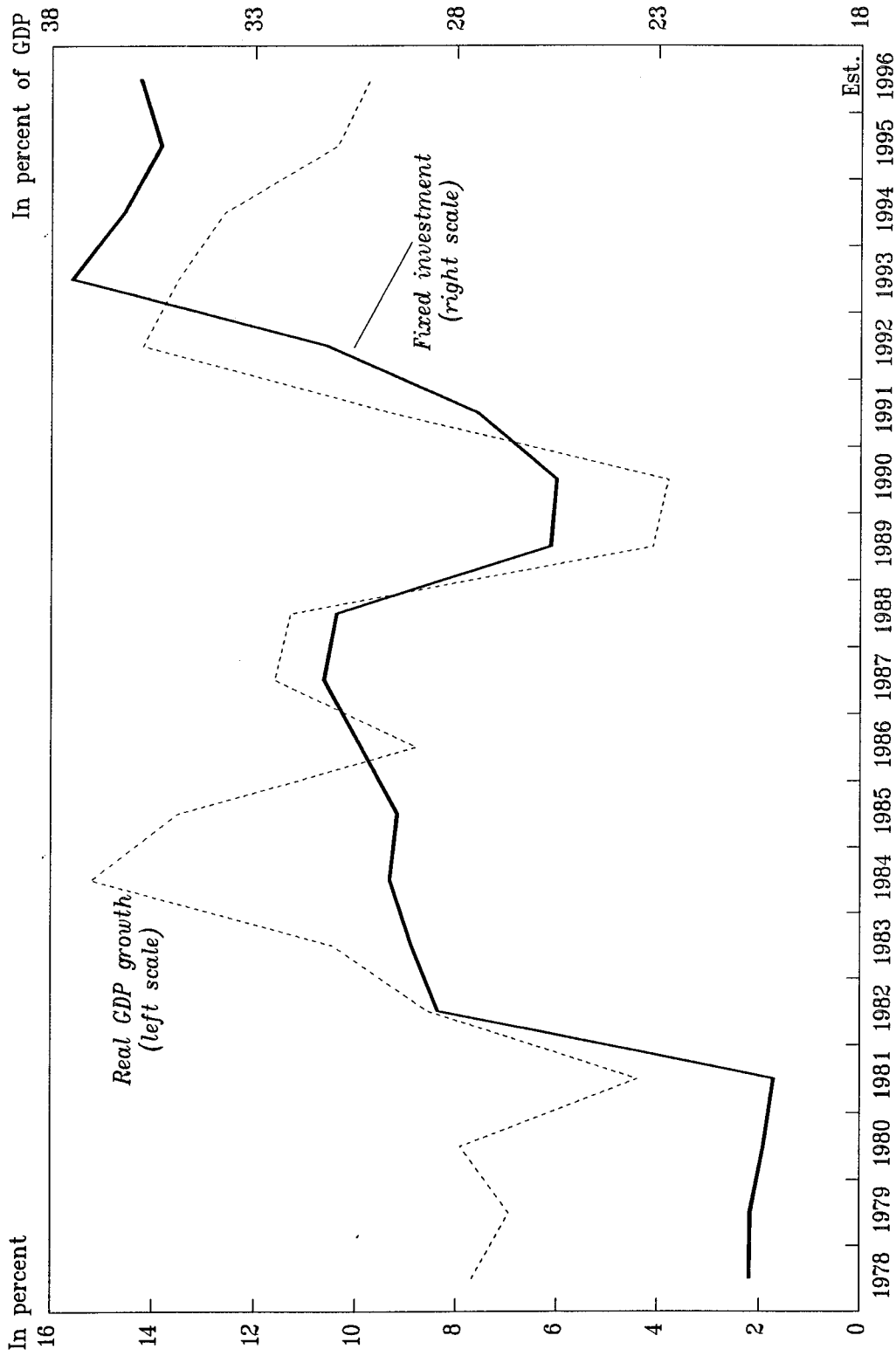


Sources: State Statistical Bureau; and State Administration of Foreign Exchange.

CHART 9

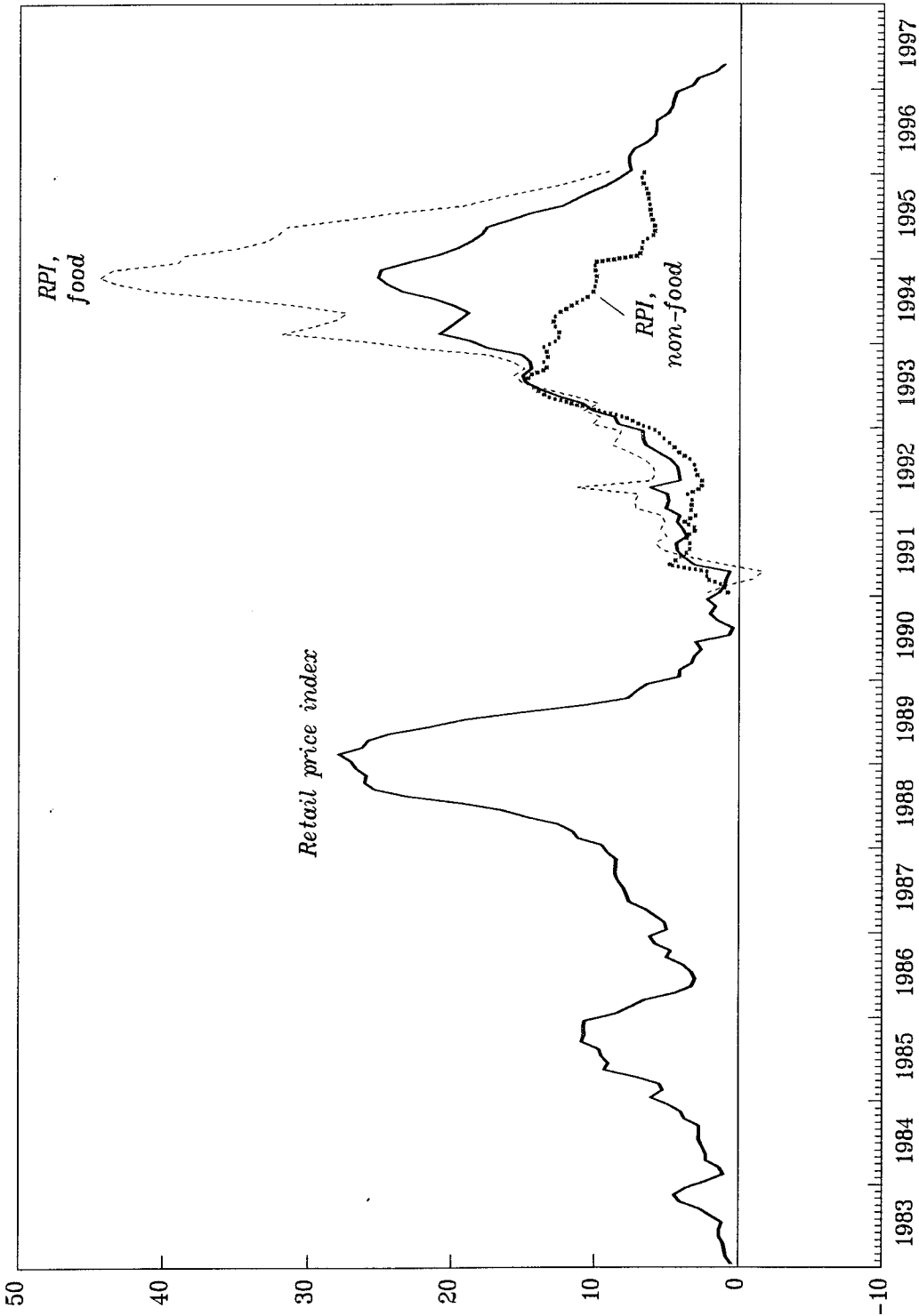
CHINA

RATIO OF FIXED INVESTMENT TO GDP



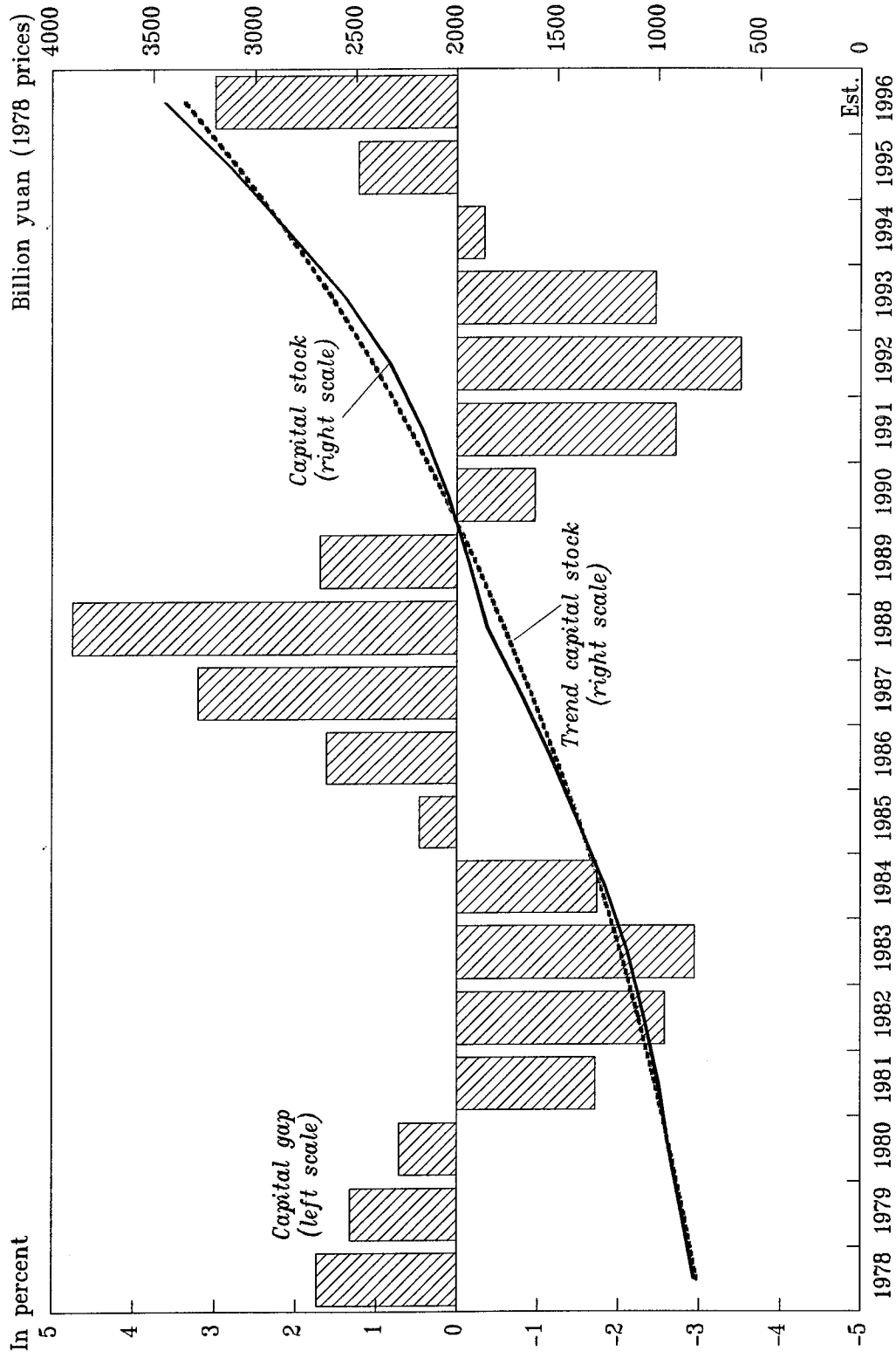
Source: State Statistical Bureau.

CHART 10
CHINA
FOOD AND NON-FOOD COMPONENTS OF RPI INFLATION
(Twelve-month change; in percent)



Source: State Statistical Bureau.

CHART 11
CHINA
ESTIMATED CAPITAL STOCK



Source: Hu and Khan (1996); and staff estimates.