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Deflation in Hong Kong SAR

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Abstract

This paper examines the causes of deflation in Hong Kong SAR, exploring whether it reflects a prolonged process of adjustment to cyclical shocks or whether it results from price equalization pressures arising from structural integration with mainland China. To gauge the relative importance of these factors, the paper provides both an econometric and a qualitative analysis of the price dynamics between Hong Kong SAR and Shenzhen, a neighboring city in mainland China. It finds that the role of price equalization as a source of deflation is minor. Deflation in Hong Kong SAR is best explained by successive cyclical shocks which have been amplified by balance-sheet and wealth effects.

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I. INTRODUCTION

Deflation in Hong Kong SAR has lasted for more than four years now. This long duration has come as a surprise to many, and significant controversy has emerged about the causes of the Hong Kong deflation. Two views, in particular, have gained prominence.

- The "structural view" sees deflation in the context of the ongoing economic integration between Hong Kong SAR and mainland China. Greater openness triggers forces of price equalization that narrow the price differentials between Hong Kong SAR and its lower-cost hinterland. This price equalization process is considered responsible for downward pressure on the Hong Kong price level.

- The "cyclical view" suggests that deflation is a reflection of a process of internal price adjustment in response to cyclical shocks. The exchange rate regime of Hong Kong SAR, with its linked exchange rate, is such that the burden of adjustment to shocks falls on internal prices and not on the external value of the currency.

This paper provides an assessment of the relative importance of structural and cyclical factors as possible sources of deflation, where—throughout the paper—the structural factor will refer to the process of price equalization between Hong Kong SAR and its lower-cost hinterland. This assessment is based on econometric and qualitative methods.

- The econometric part of the paper is centered around the following three questions. First, has there been any price equalization pressure on the price levels of Hong Kong SAR and its hinterland? Second, is deflation a reflection of such pressure, or have cyclical and other factors played a more important role? Third, has the relative importance of price equalization pressure increased in recent years?

- The qualitative part explores two areas that aim to shed further light on the relative importance of structural and cyclical factors. First, if deflation were mostly structural, what are the channels through which the forces of price equalization would have most likely caused deflationary pressure on the Hong Kong price level? Second, if deflation were mostly cyclical, how could one reconcile such cyclical view with the long duration of deflationary adjustment?

To tackle these issues, the analysis will focus on the price dynamics between Hong Kong SAR and the neighboring city of Shenzhen in the province of Guangdong. The choice of Shenzhen, as will be argued later, is without loss of generality. The datasets considered in this paper will span a period that ends in early 2002, the completion time of this study.

The paper relates to a large literature on price convergence, which focuses on how quickly deviations from the law of one price vanish. Relevant studies include Engel and Rogers (1996), Parsley and Wei (1996), and Cecchetti, Mark, and Sonora (2002) on price convergence between cities in the United States and/or Canada, Rogers (2001) on price convergence between countries in the euro area, and Wei and Fan (2002) on price

convergence between cities of mainland China. Closely related is the study of Ha and Fan (2002), which examines the extent of price convergence between Hong Kong SAR and cities of mainland China, together with its deflationary impact on the Hong Kong price level. The findings of the latter study will be discussed later.

The paper is structured as follows. Section II reviews price developments. Section III offers an econometric analysis on the causes of deflation. Section IV studies potential channels of price equalization and addresses the persistence of deflation. Section V concludes the paper.

II. PRICE DEVELOPMENTS

Deflation in Hong Kong SAR has lasted for more than four years now (Figure 1), causing a significant fall in the overall price level. Between September 1998 and January 2002, which is the period under review, the consumer price index has fallen by 12 percent. This has brought the price level back to its level of late 1995.

Figure 1. Hong Kong SAR: CPI Inflation

(Twelve-month percent change)

Source: CEIC Database.
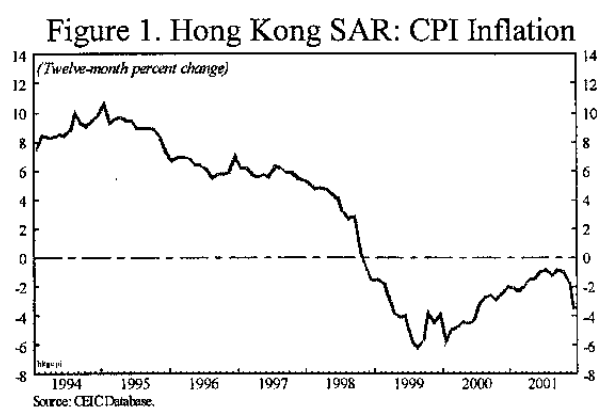
Deflation has been mainly accounted for by a sharp fall in housing costs associated with the collapse of the real estate price bubble of the mid-1990s (Table 1 and Figure 2). The bubble had been driven by rapid productivity and wage growth in the tradable sector that spilled over into the nontradable sector, a process that was exacerbated by speculative motives (Duenwald, Kalra, and Mihaljek, 2000). After a sharp initial correction,

Table 1. Hong Kong SAR: Major Contributors to Deflation

	Cumulative change Sept. 1998-Jan 2002 (Percent)	Weight in Overall CPI (Percent)	Contribution to Overall Deflation (Percent pt)	Contribution to Overall Deflation (Percent)
Five most important contributors:				
Housing	-20.3	29.9	-6.1	50.5
Food	-6.1	26.7	-1.6	13.7
Clothing and footwear	-32.9	4.1	-1.4	11.3
Durable goods	-20.1	6.2	-1.3	10.5
Miscellaneous services	-3.6	14.4	-0.5	4.3
Memorandum Item:				
All items	-12.0	100.0	-12.0	100.0

Source: Composite CPI data from CEIC.

property prices have continued to fall, albeit at a slower pace, resulting in a decline of about 55 percent since the peak in late 1997. The consequent decline in rentals—about 20 percent since the mid-1998 peak—has been responsible for half of the deflation in the overall CPI. Other components of the CPI that have declined were food, clothing and footwear, and durable goods, together accounting for about one-third of deflation.

Figure 2. Hong Kong SAR and Shenzhen: Components of CPI Inflation

Source: CEIC Database.
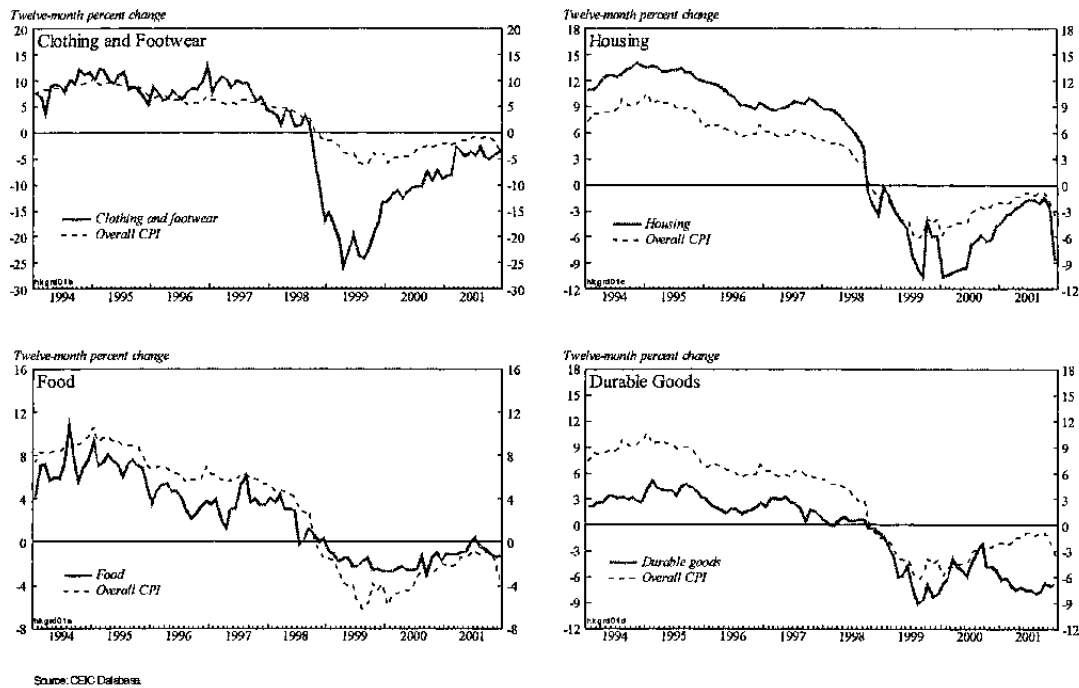
III. ECONOMETRIC EVIDENCE

This section presents an econometric analysis of the relative role of cyclical, structural, and other factors as possible causes of deflation in Hong Kong SAR. The analysis is conducted in four steps. First, a number of methodological issues are discussed. Second, evidence is collected in support of price equalization pressure so as to construct a proxy for the structural determinant of deflation. Third, the relative role of cyclical, structural, and other factors is examined. Fourth, the paper explores whether the relative role of the structural factor has become more pronounced recently.

A. Methodological Issues

This subsection prompts the choice of Shenzhen in capturing the broader issue of integration with mainland China and the use of indices in constructing a proxy for the price equalization pressures entailed by integration.

The choice of Shenzhen

In examining the role of price equalization pressure as a source of deflation, the paper restricts attention to the price dynamics between Hong Kong SAR and the neighboring city of Shenzhen. The choice of Shenzhen is made on the following grounds.

First, choosing Shenzhen benefits the analysis, as its geographical proximity allows for a more powerful test of the deflationary impact of price equalization. If price equalization between Hong Kong SAR and Shenzhen cannot be significantly associated with deflation in Hong Kong SAR, then the comparison of Hong Kong SAR with another, more distant, region is unlikely to alter that conclusion. This is so because the two factors that have been suggested as the major sources of "structural deflation" diminish in importance as the distance to Hong Kong SAR increases. These two factors are:

- *Factor price equalization in the property market.* The fall in housing costs— about 20 percent since the mid-1998 peak—has been responsible for half of Hong Kong SAR's cumulative deflation. To test whether housing costs have fallen because of greater integration with mainland China, one would ideally select a region where property is considered a close substitute to Hong Kong property. As geographical proximity is an important determinant of substitutability, Shenzhen appears as a natural candidate.

- *Cross-border shopping by Hong Kong SAR residents.* The practice of cross-border shopping among Hong Kong SAR residents has been on the increase. To test whether this has caused substantial pressure on the price level, the analysis would benefit from selecting an area that is sufficiently close to Hong Kong SAR.

Second, focusing on Shenzhen is not necessarily unrepresentative of the wider picture. The process of integration between Hong Kong SAR and mainland China seems to have been most vibrant in Guangdong and it therefore seems to make sense to restrict attention to this province. Furthermore, the selection of Shenzhen within Guangdong need not distort the analysis, since its CPI series shows a strong co-movement with other cities, such as Guangzhou.

The use of price level indices

In measuring the degree of price equalization pressure, the paper uses a proxy that will be labeled as the "price level gap". The price level gap is defined as the log difference between the CPIs of Hong Kong SAR and Shenzhen. The price level gap at time t equals the sum of the price level gap at time 0 and the cumulative inflation differential up to time t:

$$gap_t = \log(P_t^{HK}) - \log(P_t^{SZ}) \cong \log(P_0^{HK}) - \log(P_0^{SZ}) + \sum_{i=1}^{t}(\pi_i^{HK} - \pi_i^{SZ}) ,$$

where the superscripts refer to Hong Kong SAR and Shenzhen.

Note that, since the price level gap is based on indices with arbitrary base, the size of the gap is indeterminate. The gap could therefore well be negative (implying that the price level in Hong Kong SAR is lower than that of Shenzhen) in contrast to a gap based on actual prices, which would typically reveal a positive gap.[2]

The indeterminacy of the price level gap is, however, irrelevant for the purposes of this paper. To see this, recall that (i) the paper aims to measure the deflationary impact of price equalization pressure; (ii) the difference between any two price level gaps with a different arbitrary base is a constant; and, (iii) the addition of a constant to an independent variable does not alter the coefficient estimates, only the regression constant. What does matter is the change in the price level gap, which is equal to the inflation differential between Hong Kong SAR and Shenzhen over a particular period. A negative inflation differential is needed for the price levels to converge. Thus, Shenzhen needs to inflate at a faster rate, or deflate at a lower rate, compared to Hong Kong SAR.

B. Price Equalization Pressure

This subsection examines whether the price level gap between Hong Kong SAR and Shenzhen has indeed narrowed as a result of price equalization pressure. It thus verifies whether the price level gap, measured as the difference between the Hong Kong and Shenzhen CPI series (Figure 3), can be used as a proxy of the structural determinant of deflation in Hong Kong SAR.

To measure the extent of price equalization pressure, an equation is estimated that relates the change in the gap between the Hong Kong and Shenzhen price levels to the gap of the previous period. Price equalization pressure would manifest itself if a "large" gap were responsible for a smaller gap in the next period.

Figure 3. Hong Kong SAR and Shenzhen: Comparisons in CPI Inflation

Table 2 presents regression results using a sample of monthly data covering the period of January 1993 to December 2001. The dependent variable is the change in the price level gap (i.e., the difference between the Hong Kong and Shenzhen inflation rates).[3] Independent variables include the 12-month lag of the

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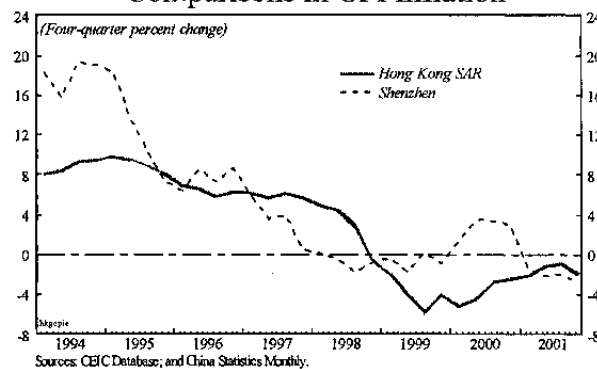
[2]Survey evidence suggests that the gap is rather large in absolute terms. CLSA (2001) reports that a basket of nondurable consumer goods is about 40 percent cheaper in Shenzhen.

[3]All price level and inflation rate variables in this paper have been seasonally adjusted with the U.S. Bureau of Census X11.2 procedure. For presentational purposes, the percentage

price level gap and two interaction terms.[4] The first interaction term includes a dummy variable which equals one after November 1997 (when the property market started its collapse); the second interaction term includes a dummy which is set to one after October 1998 (when deflation was first recorded in Hong Kong SAR).

Table 2. Hong Kong SAR and Shenzhen: Price Equalization Pressure

Independent Variables	Dependent Variable: Change in the Price Level Gap					
	Without constant			With constant		
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	..	..	..	-0.02	-0.02	-0.02
	..	..	..	(-8.15)*	(-6.56)*	(-6.42)*
Price level gap (lagged)	-0.52	-0.61	-0.62	-0.48	-0.50	-0.54
	(-10.55)*	(-12.01)*	(-12.81)*	(-12.39)*	(-11.01)*	(-12.49)*
Price level gap (lagged) * dummy_property	..	0.50	..	..	0.09	..
	..	(4.12)*	..	..	(0.78)	..
Price level gap (lagged) * dummy_deflation	..	..	0.62	..	..	0.30
	..	..	(5.12)*	..	..	(2.66)*
Adjusted R^2	0.33	0.42	0.46	0.58	0.58	0.61
N	108	108	108	108	108	108

Note: Monthly data from 1993:01 to 2001:12; t-statistics are between parentheses;
*, **, and *** indicate statistical significance at the 1, 5, and 10 percent levels;
the change in price level gap is defined as the year-on-year difference in the gap.

gaps are mean-standardized. All data are taken from CEIC and China Statistics Monthly. All of the following regressions have been estimated with OLS.

[4]All lags in this paper refer to one-year lags.

The results are as follows:

- *The price levels of Hong Kong SAR and Shenzhen have been converging as a result of price equalization pressure.* The data indicate the presence of some degree of price equalization pressure during the period under review. This is reflected by the significantly negative coefficients on the lagged levels of the gap. Large price differentials have generally caused the gap to close by more than small ones.[5]

- *The major part of such pressure appears to have occurred before the collapse of the property price bubble.* This is reflected by the two interaction terms which offset the negativity of the convergence parameter—the exception being regression (5).

C. Determinants of Deflation in Hong Kong SAR

Having established that the price level gap has exerted price equalization pressure, this subsection examines whether it has also been responsible for deflationary pressure on the price level of Hong Kong SAR. One can think of two reasons why the finding of price equalization pressure is not sufficient for deflationary pressure:

- *Price convergence as a result of price equalization pressure may be consistent with various patterns of inflation.* For example, Shenzhen could experience inflation, when Hong Kong SAR has stable prices. Or, Hong Kong SAR could experience deflation, when Shenzhen has stable prices.

- *Deflation in Hong Kong SAR may be due to factors unrelated to price equalization pressure.* The regression analysis thus needs to control for other factors, including the cyclical state of the economy and the puncturing of the property price bubble.

Table 3 presents regressions that analyze the link between deflation in Hong Kong SAR and price equalization pressure, while controlling for other factors. The sample consists of quarterly data from the first quarter of 1995 until the last quarter of 2001.[6] The Hong Kong inflation rate is taken as the independent variable.[7] Independent variables include the rate of unemployment, the nominal effective exchange rate, lagged nominal credit growth, and the

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[5] The speed of convergence is meant to capture the extent of integration between markets or the efficiency with which price differentials between spatially separate locations are arbitraged away. See Obstfeld and Taylor (1997), and Ejrnaes and Persson (2000) for extensions.

[6] The sample period is smaller than for the previous regressions due to limited data availability. The choice of quarterly frequency is motivated by the need to control for the cyclical component.

[7] Over the sample period under review, the inflation variable is found to be stationary.

lagged price level gap. The data on the relative inflation rates and the price level gaps is presented in Annex Figures 1 and 2.

The choice of independent variables is motivated as follows:

- *Unemployment.* In line with Peng, Cheung, and Fan (2001), who find that most of the variation in unemployment in Hong Kong SAR has reflected cyclical conditions, unemployment has been selected as a proxy for the business cycle.

- *Nominal effective exchange rate.* The nominal effective exchange rate has been included as a control for imported inflation.

- *Nominal credit growth.* Nominal credit growth, lagged by four quarters, has been included to capture the buildup and subsequent collapse of the asset price and its lagged effect on the housing component of the CPI.[8] The lag reflects the typically slow and staggered response of rental contracts to property price developments.

- *Price level gap.* The price level gap between Hong Kong SAR and Shenzhen, lagged by four quarters, controls for price equalization pressure.

To check against aggregation bias, the same regressions are estimated using a more disaggregated data set, including subcomponent CPI indices for clothing, food, health, durables, housing, services, and transportation.[9]

To check for robustness, alternative specifications were examined, featuring a lagged dependent variable, various lags for the independent variables, and alternative proxies for the asset price bubble. Also, several specifications were examined with alternative proxies for the business cycle, including measures of the output gap. These, however, did not yield

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[8]Samiei and Schinasi (1994) and Collyns and Senhadji (2002) document the relevance of credit growth for asset price bubbles.

[9]Due to differences in CPI aggregation between Shenzhen and Hong Kong SAR, inevitable problems arise when constructing comparable subcomponent CPI indices. For this reason, the Shenzhen subcomponent of "recreational, educational, and cultural articles" has been left out. As to the remaining components, a sufficiently close match has been achieved, although some differences remain: (1) the Shenzhen food index includes alcoholic drinks and tobacco; (2) the Shenzhen durable goods index excludes durable goods for recreational use; (3) the Shenzhen transportation index includes communication (4) the Shenzhen housing index includes gas, water, and electric; and (5) the services index has been left out for 2001 as the Shenzhen definition was changed that year.

qualitatively different results, suggesting that the recent increase in structural unemployment need not invalidate results based on the overall rate of unemployment.[10]

Table 3. Hong Kong SAR: Determinants of Deflation

where i = Independent Variables	Dependent Variable: Inflation in Component i							
	(1) all items	(2) clothing	(3) food	(4) health	(5) durables	(6) housing	(7) services	(8) transport
Constant	0.11	0.21	0.07	0.05	0.05	0.15	0.06	0.03
	(11.65)*	(8.61)*	(9.07)*	(4.92)*	(4.65)*	(8.18)*	(2.94)*	(4.09)*
Unemployment rate	-2.49	-6.22	-1.73	-1.00	-1.92	-3.71	-0.95	-0.10
	(-12.79)*	(-12.42)*	(-9.66)*	(-4.35)*	(-8.61)*	(-9.70)*	(-1.95)***	(-0.66)
Neer appreciation	-0.42	-0.24	-0.24	-0.17	-0.32	-0.41	-0.16	0.11
	(-4.71)*	(-1.34)	(-3.55)*	(-1.89)***	(-4.10)*	(-3.00)*	(-1.02)	(2.37)**
Credit growth (lagged)	0.21	0.39	0.13	0.09	0.19	0.37	0.05	0.03
	(7.92)*	(4.54)*	(5.44)*	(4.30)*	(6.42)*	(6.98)*	(1.30)	(2.18)**
Price level gap in i (lagged)	-0.24	-0.22	0.08	-0.09	0.00	-0.10	0.15	-0.20
	(-2.28)**	(-3.66)*	(1.17)	(-1.55)	(-0.03)	(-1.26)	(2.39)**	(-8.94)*
R^2	0.94	0.90	0.88	0.74	0.90	0.91	0.91	0.95
N	28	28	28	28	28	28	24	28

Note: Quarterly data from 1995:01 to 2001:4 (for services to 2000:4); t-statistics are between parentheses; *, **, and *** indicate statistical significance at the 1, 5, and 10 percent levels.

[10]See Ha and Leung (2001), and Gerlach and Yiu (2002) for measures of the Hong Kong output gap using, respectively, unobservable-component estimation and the production function approach.

The results can be summarized as follows:

- *The rate of change in Hong Kong SAR's price level is explained well by the regressions.* The overall explanatory power is relatively high; most coefficients are significant at the one-percent level; and almost all coefficients have the predicted sign.

- *Cyclical and other factors explain most of the deflation, whereas the structural factor appears to play a negligible role.* Variations in unemployment, credit growth, and the nominal effective exchange rate contribute 36 percent, 14 percent, and 5 percent, respectively, to the explanatory power of the deflation equation. In contrast, the price level gap contributes only 2 percent.[11]

- *The same pattern holds for the determinants of deflation in the CPI subcomponents.* Except for clothing and transportation, the price level gap does not add much to overall explanatory power. Variations in unemployment, credit growth, and nominal effective exchange rate explain most of the deflation.

The relative unimportance of the structural factor is corroborated by the work of Ha and Fan (2002). Examining the price dynamics between Hong Kong SAR and four cities in mainland China (Shenzhen, Guangzhou, Shanghai and Beijing), the authors find that price equalization pressure has played a limited role as a source of deflation in Hong Kong SAR. Although the work of Ha and Fan differs from this paper in a number or ways, it is encouraging to note that the two papers, using different methodologies, share similar conclusions.[12]

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[11]The formula for calculating the contributions is $\left(1 - \widetilde{R}^2\right)\hat{r}^2$, where $\widetilde{R}^2$ is the multiple coefficient of determination of the restricted regression that excludes the independent variable in question, and $\hat{r}^2$ is the partial coefficient of determination between the dependent variable and the considered independent variable in the unrestricted regression.

[12]Ha and Fan use individual price data, compiled from cost-of-living surveys by the Economist Intelligence Unit, rather than aggregate CPI data. Further, sample sizes differ. While the use of individual price data allows for a richer data set in the cross-sectional dimension, the data is collected only semi-annually, with most individual price data for Shenzhen being available only from 1999 onwards.

D. Intensification of Price Equalization Pressure

Table 4 examines whether the relative importance of the structural factor has increased in recent years. Two periods are examined: the period right after the collapse of the property market in 1997, and the period commencing with the start of deflation in 1998. The data set consists of the same quarterly data used in the previous regressions. Focusing on overall CPI inflation, two interaction terms are included to allow for a differential impact of the price level gap after the two events in 1997 and 1998.

The regression results indicate that deflationary impact of price equalization pressure has not significantly increased after the collapse of the property market in 1997, nor after the onset of deflation in 1998. As the regression results indicate, the dummy interaction terms are not significant at the 10-percent level.

Table 4. Hong Kong SAR: Intensification of Price Equalization Pressure

Independent Variables	Dependent Variable: Inflation		
	(1)	(2)	(3)
Constant	0.11	0.10	0.10
	(11.65)*	(10.23)*	(10.69)*
Unemployment rate	-2.49	-2.40	-2.39
	(-12.79)*	(-11.48)*	(-11.99)*
Neer appreciation	-0.42	-0.37	-0.35
	(-4.71)*	(3.73)*	(-3.58)*
Credit growth (lagged)	0.21	0.20	0.20
	(7.92)*	(7.79)*	(7.86)*
Price level gap (lagged)	-0.24	-0.03	0.02
	(-2.28)**	(-0.14)	(0.10)
Price level gap (lagged)	..	-0.23	..
* dummy_property	..	(-1.16)	..
Price level gap (lagged)	..	..	-0.28
* dummy_deflation	..	..	(-1.52)
Adjusted R^2	0.94	0.94	0.95
N	28	28	28

Note: Quarterly data from 1995:01 to 2001:4; t-statistics are between parentheses; *, **, and *** denote statistical significance at 1, 5, and 10 percent;

IV. QUALITATIVE DISCUSSION

This section aims to complement the econometric findings with a qualitative analysis that centers around two questions. First, if deflation were mostly structural, what are the channels through which price equalization has likely led to deflationary pressure in Hong Kong SAR? Second, if deflation were mostly cyclical, how can one reconcile the cyclical view with the long duration of adjustment?

A. Channels of Price Equalization

To shed further light on the relative importance of structural and cyclical factors, the potential channels of price equalization are examined. Specifically, price determination is analyzed in the product, labor, and property markets. The guiding principle will be to scrutinize the structural view using any available qualitative and anecdotal evidence, and to ask whether a cyclical explanation might be more plausible.

Product market

While growing integration with mainland China facilitates price equalization in the product market, deflation in product prices could also be the result of strong procyclicality of certain products. Cheaper food imports from mainland China and the increased practice of cross-border shopping among Hong Kong residents may have led to some downward pressure on product prices. However, it should also be noted that:

- *The demand for certain products, such as clothing and durable goods, is highly sensitive to the business cycle.* Other economies suffering a cyclical downturn but not sharing Hong Kong SAR's integration challenges (such as Singapore) have experienced a similar pattern of deflation in the prices of clothing and durable goods.

- *The current prevalence of price cuts and discounts can be explained by the strong pro-cyclicality of mark-up margins.* Competition among retailers typically intensifies during a downturn. With mark-up margins strongly procyclical, a large cyclical price response is to be expected.

- *Weak price developments in major trading partners together with the nominal effective appreciation of the Hong Kong dollar (Figure 4) have also contributed to the weakness in product prices.* Deflation in Japan as well as the weakness of the yen have likely had a particularly dampening effect.

Figure 4. Hong Kong SAR:
Nominal Effective Exchange Rate

(Index: 1992M1=100)

Source: IMF, Information Notice System

Labor market

Deflation has also been attributed to price equalization pressure in the labor market. With the demand for non-skilled labor falling as low-skilled activities migrate across the border, rising unemployment among low-skilled workers may create deflationary pressure. However, other factors come into play:

- While mismatch in labor skills is an important problem that needs to be addressed, it is not a convincing explanation for persistent deflation. Downward pressure on the wages of low-skilled labor is to be expected as businesses in Hong Kong SAR continue to upgrade along the value-added chain. However, given the shortage of skilled labor, the impact on average wage costs of falling low-skilled wages may be more than offset by upward pressure on wages of high-skilled labor.

- *A similar fallacy would attribute deflation to a structural displacement of services jobs to the Mainland.* A large part of the Hong Kong services sector supports the export-oriented manufacturing base located in Guangdong, controlled by businesses registered in the Hong Kong SAR. With manufacturing in Guangdong hit hard by the global cyclical downturn, it is not surprising that the services industries in Hong Kong SAR were affected too.

Property market

While the "structural view" attributes the retrenchment of property prices to the availability of cheaper real estate across the border, this factor is likely to have played only a limited role.

Residential property market

Anecdotal evidence suggests that, while purchases of Mainland residential property by Hong Kong residents have been on the increase, their effect on the Hong Kong residential property market has been minor.

- The increase in the demand for residential property in Shenzhen is mostly the result of demand creation rather than demand displacement. More than half of the residential units located in Guangdong and owned or rented by Hong Kong residents are used as second homes. A survey by the Census and Statistics Department suggests that (i) a new life-style is emerging among Hong Kong residents who keep Hong Kong SAR as their home base and buy or rent a second home in the Mainland for vacation purposes, and (ii) this is in line with the observation that the major popular housing developments in the Pearl River Delta region are very quiet and mostly unoccupied on weekdays but have a higher occupancy during weekends.[13]

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[13]Census and Statistics Department (2001).

- With various factors preventing factor price equalization in the residential property market, a price differential between Hong Kong SAR and Shenzhen is likely to persist. Factors that prevent factor price equalization include the costs of commuting (both out-of-the-pocket costs and opportunity costs of time), different legal systems, and differences in terms of the cost and quality of education and medical services.[14] The total estimated traveling time from Shenzhen to Admiralty is about an hour and a half. In addition to the long traveling time, the number of changes of transportation and, especially, the transportation costs make commuting to Hong Kong SAR unattractive. These costs amount to about US$29 per day from Futian in Shenzhen to Central in Hong Kong SAR, and back.[15]

- *The availability of cheaper housing plays only a minor role in the decision of households to relocate to the Mainland.* The survey by the Census and Statistics Department on housing aspirations shows that about 0.7 percent of those who have taken up residence in the past have done so because of cost considerations. Only about 1.2 percent of all households in Hong Kong have an intention to take up longer residence in the Mainland over the next ten years. Most of those who would wish to do so are from the lower income group.

Commercial property market

The decline of rentals in the commercial property market is unlikely to have resulted from price equalization pressure. Although Hong Kong SAR has repeatedly listed among the most expensive cities in the world, the Hong Kong location commands a premium related to its function as an international hub. Furthermore, commercial rental costs are reportedly only a minor factor in the location decision of firms.

B. Persistence of Deflation

Even if deflation is largely cyclical, its persistence raises the question of why adjustment has taken so long. The persistence of deflation may be explained by the fact that Hong Kong SAR suffered two successive shocks and by the way deflation has propagated and amplified itself into the real economy.

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[14]See UBS Warburg (2001).

[15]CLSA Emerging Markets, 2001, "Hong Kong's future. Tough choices to stay afloat," Hong Kong Market Strategy Report (Hong Kong SAR), November.

Successive shocks

Deflation has spanned a period during
which the Hong Kong economy was hit by
two external shocks, causing large swings
in output (Figure 5). As a result of the
Asian crisis, Hong Kong SAR suffered a
sharp decline in output in 1998. This was
followed by a strong, but brief, recovery
in 1999-2000, during which deflation also
started to decelerate. The renewed external
downturn reduced growth to almost zero
in 2001, with deflation re-accelerating as
well.

Figure 5. Hong Kong SAR:
Real GDP Growth
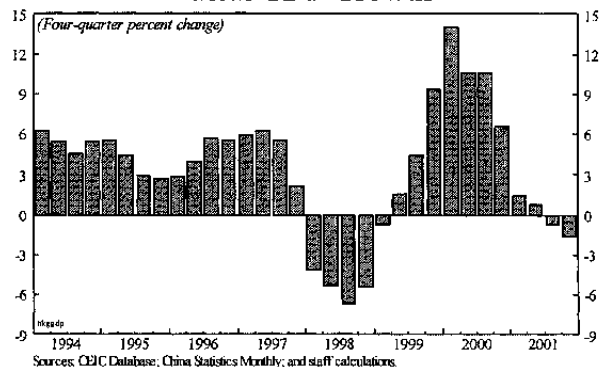
Propagation and amplification

The two external demand shocks of recent years have propagated themselves into the real
economy through a drawn-out adjustment process in product and factor markets. Given the
linked exchange rate system, the shocks had to be absorbed through price adjustment in
product and factor markets.

- *In product markets, price
  adjustment has been relatively fast.*
  As noted earlier, various
  components of the CPI underwent
  large and rapid adjustment (see
  Table 1).[16]

- *In labor markets, nominal wages
  have adjusted more slowly than
  prices.* Despite increased
  unemployment and drops in
  productivity, real wages have
 continued to grow (Figure 6).[17]

Figure 6. Hong Kong SAR:
Wages and Unemployment

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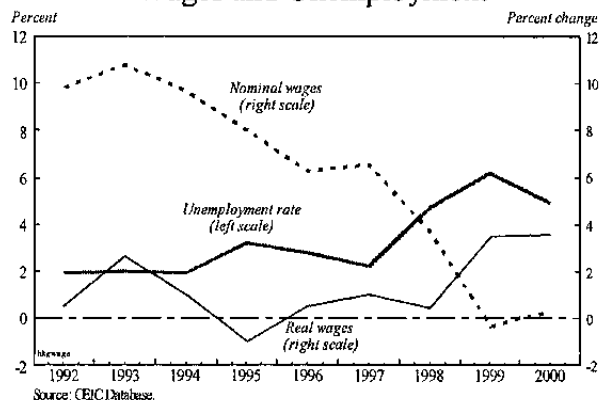
[16]Zitzewitz (2000) shows that, compared to OECD economies, price adjustment has
historically been much faster in Hong Kong SAR. Mark-up margins are significantly more
pro-cyclical in services, while only slightly more counter-cyclical in manufacturing. The shift
to a service-based economy has therefore made economy-wide margins more pro-cyclical,
contributing to a rate of price adjustment that is faster than in the OECD.

- *In asset markets, the shocks entailed large movements in property and stock prices (Figure 7).* The property market saw a large correction, with residential property prices falling by 45 percent between October 1997 and October 1998. Property prices continued to fall subsequently, albeit at a lower pace, with rentals lagging behind. The stock market suffered a correction of about 43 percent between July 1997 and January 1998, with continued volatility thereafter.

Figure 7. Hong Kong SAR: Property Prices
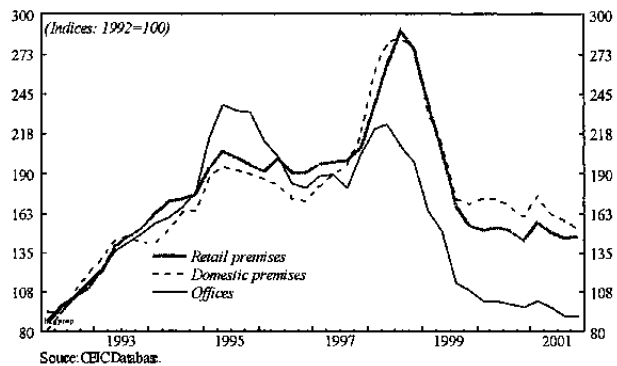
Deflation in Hong Kong SAR appears to have been amplified through large balance-sheet and wealth effects of falling property and stock prices. Balance-sheet and wealth effects are particularly relevant in Hong Kong SAR because a large amount of wealth is held in property and stocks, and bank lending is mostly secured against real estate.

- *Private consumption expenditure has slowed as a result of asset price deflation.* Peng, Cheung and Leung (2001) report that more than half of the decline in private consumption expenditure in 1998 can be explained by balance-sheet effects. Between 1997 and 2000, net housing equity in the private residential sector has dropped by more than 50 percent.

- *With deteriorating balance sheets limiting the capacity and willingness of firms to take on additional debt, private investment has also declined.* As banks became increasingly reluctant to provide credit under falling asset values, small- and medium-sized enterprises (SMEs), which play an important role in the Hong Kong economy, have particularly suffered (HKMA, 2000). [18] This may reflect the fact that SMEs

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[17] The incomplete adjustment of real wages, associated with higher unemployment, is not necessarily the result of inefficiency. Lack of adjustment could be explained by the reluctance of employers to lower nominal wages because of efficiency wage arguments: lower wage may lead to lower productivity and employers may therefore prefer to lay off employees. Also, the sole consideration of wage data distorts the degree of labor market flexibility as non-wage compensation items, such as bonuses, have declined significantly too.

[18] Survey data indicate that SMEs (enterprises defined as having less than 100 employees) contribute 43 percent of value-added in the manufacturing sector, 59 percent in the construction sector, 78 percent in the distributive and catering trades, 32 percent in the transport, storage, and communication sector, and 66 percent in the financing, insurance, real estate, and business services sector.

typically depend on collateral in securing credit. Although subdued demand became the main factor restraining loan growth in recent years (Chiu and Lai, 2001), banks have continued to remain cautious in lending to SMEs.

Other amplifiers have contributed too:

- *Precautionary savings effects have dampened consumption and investment.* Due to increased unemployment risk and the uncertain business outlook, precautionary savings effects have amplified the slowdown in consumer durable goods purchases and fixed investment. By increasing the rate of unemployment, downward nominal wage rigidity may have exacerbated this effect.

- *High real interest rates have likely delayed spending plans.* With deflationary expectations settling in, high ex-ante real interest rates have likely been a factor in the decision of households and firms to postpone consumption and investment outlays.

The slowdown in spending generated through these amplifiers is likely to have made deflation more persistent. Kiyotaki and Moore (1997) show that a one-off shock may cause a persistent decline in credit through the interaction with an amplified asset price response. Along these lines, asset price deflation (which implies overall deflation in Hong Kong SAR, given the importance of rentals in the CPI) may well last for a protracted period of time even if there is no persistence in the shock.

V. CONCLUSIONS

The long duration of deflation in Hong Kong SAR raises the question of whether it reflects a prolonged process of cyclical adjustment or whether more longer-term structural forces are at work.

This paper suggests that deflation has been mainly the result of a process of adjustment to cyclical shocks; the structural factor of price equalization has played only a minor role. A price equation for Hong Kong SAR finds unemployment, nominal credit, and the nominal effective exchange rate to be powerful determinants of deflation, while the gap between prices in Hong Kong SAR and neighboring Shenzhen has only small explanatory power. To the extent that there has been price equalization, most of it seems to have come through greater inflation in the neighboring region rather than through deflation in Hong Kong SAR.

The persistence of deflation can be explained by the fact that the economy was hit by two subsequent shocks, and by the role of balance-sheet and wealth effects in amplifying these shocks. Large balance-sheet and wealth effects from the fall of property and equity prices fed back into demand, and thus amplified and prolonged the deflationary shock. Persistence was compounded by the fact that the economy was hit by a second shock before the adjustment to the first one had been completed.

What could be done to reduce the length and amplitude of future price-adjustment cycles? Given the openness of Hong Kong SAR's economy and its rules-based approach to economic policy, the scope for countercyclical demand management is limited. However, certain structural features can be improved upon to facilitate adjustment:

- *Given the importance of the property sector, land and housing policies play an important role in the adjustment process.* Much of the feedback into the real economy through balance-sheet and wealth effects arises from volatility in the property market. Reducing such volatility is thus important, and although monetary policy is constrained by the linked exchange rate, other available policy options (including prudential safeguards) should be used to avoid speculative bubbles. Recent changes in land policy that enhance the elasticity of land supply should also help de-amplify price volatility in the property market. Finally, the policy of providing public housing at a fixed discount (which is currently under review) may also have amplified downward price pressures.

- *Asset price cycles may be moderated by a more balanced reliance on collateral-based lending.* In a purely collateral-based system, with the value of collateral highly susceptible to cyclical swings, credit is also bound to be highly volatile. On the other hand, in a pure risk assessment-based system, banks, if faced with an economic downturn, may also become overcautious in providing credit. The point is therefore to find the right balance between strong risk assessment methods and reasonable collateral requirements.[19] Such a regime will provide room for banks to supply credit to small and medium-sized enterprises (SMEs) during a downturn, which may help dampen the cycle.[20] To strengthen risk assessment capabilities, the establishment of a credit reference agency for SMEs may be useful.

- *Safeguarding and, where possible, promoting nominal wage flexibility may help dampen the feedback through unemployment and consumer demand.* Faster adjustment in prices than in nominal wages has been associated with rising unemployment, which, in turn, has contributed to uncertainty, precautionary savings, and further deflationary pressure. Since there is no government interference in private sector wage formation, the policy implication here is mainly to refrain from measures that would introduce rigidities.

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[19]Manove, Padilla, and Pagano (2001) show that over-reliance on collateral may lead to market equilibria in which the provision of cheap credit is inappropriately emphasized over project screening.

[20]Schellekens (2000) shows that, while collateralization alleviates informational asymmetries, over-reliance on collateral may inefficiently restrict the provision of credit to SMEs because of aggregate asset price volatility and costly collateral liquidation.

Annex Figure 1. Hong Kong SAR and Shenzhen: Comparison of CPIs by Components
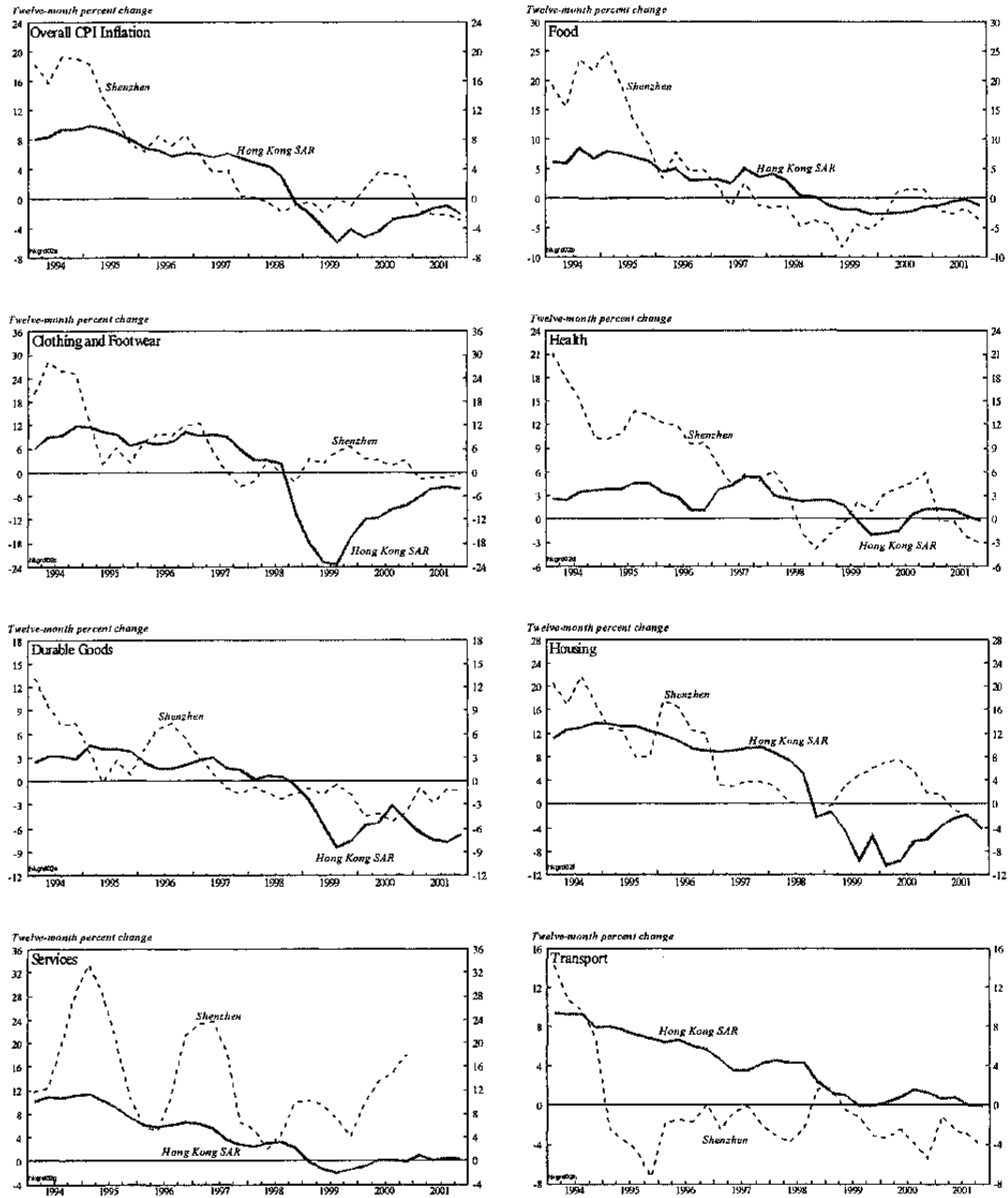
Annex Figure 2. Hong Kong SAR and Shenzhen: Standardized Price Level Gaps
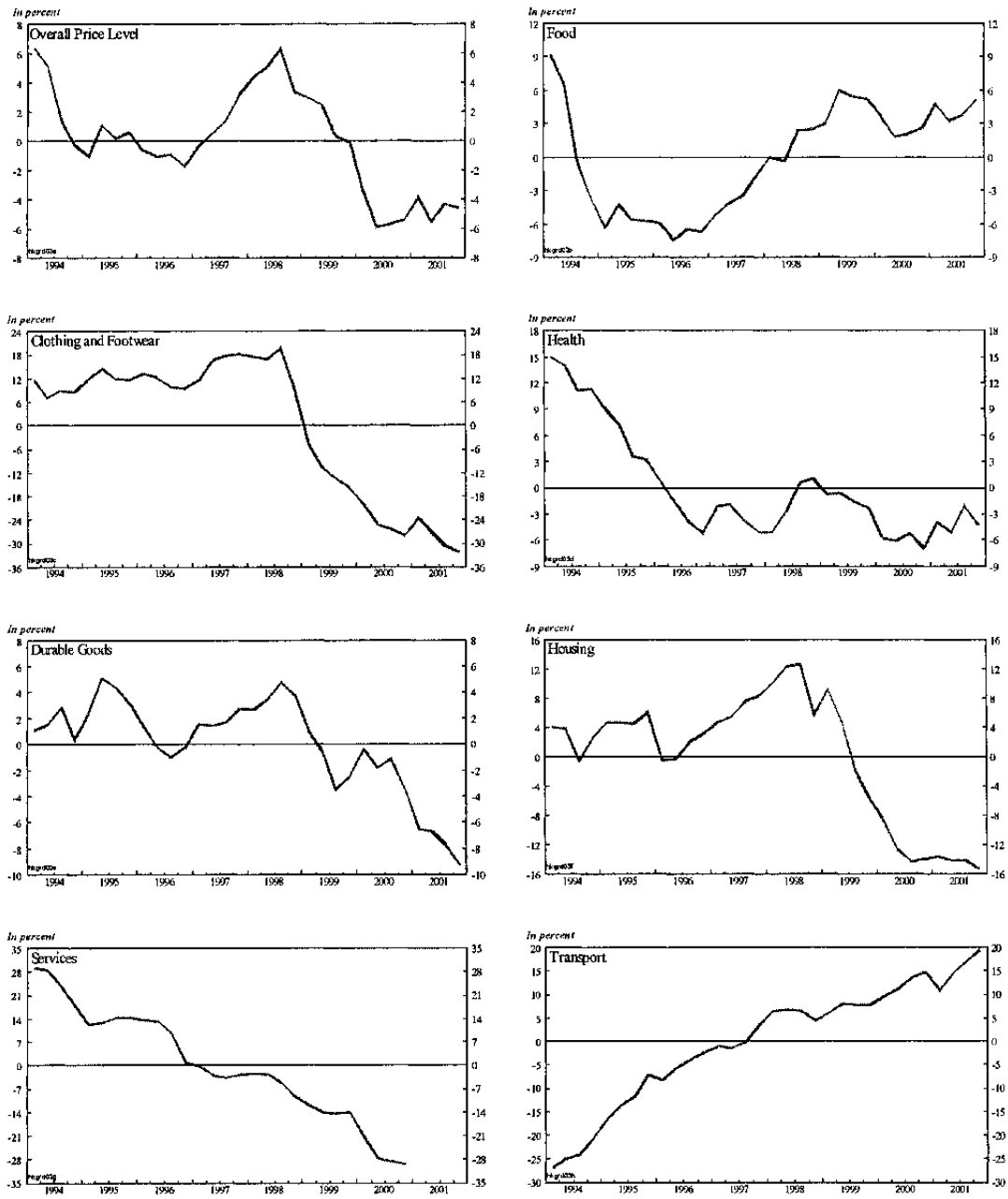
Sources: CEIC Database; China Statistics Monthly; and staff calculations.

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