The Hong Kong Economic Downturn 1998-?*

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Abstract This paper presents an analysis of the economic downturn of the Hong Kong economy after 1997. While the official story is that the Asian Financial Crisis caused the property bubble to burst, the author argues and presents evidence that it is a misguided housing policy that really was the culprit behind the deep recession of 1998 and the continued weakness in the ensuing years. The property market boom prior to 1998 was a result of strong economic performance and particularly strong savings released from among public housing tenants into the housing market. The property market collapsed because public housing tenants, who had been a strong booster for the housing market, were offered very attractive terms to buy their own units. The housing market also suffered from excessive supply that surfaced after 2000.

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I. Introduction

The four-decade-long growth of Hong Kong, at a compound annual rate of 7.48 percent, up till 1997, has often been described as a miracle.[1] Given this uninterrupted growth history, the dramatic reversal of Hong Kong's economic fortune and its failure to recover since the handover of sovereignty in 1997 took many analysts by surprise. Jao devoted a full chapter to these "Two Puzzles."[2] According to Jao, "there was no pervasive financial mismanagement, no reckless borrowing internally or externally. Hong Kong's banking system was one of the best supervised in the world." Yet what hit Hong Kong in 1998 was more like a depression than a recession. There is simply no convincing explanation as to why the currency attacks from 1997-98 on some of Hong Kong's neighboring countries could have hit the Hong Kong economy more badly than the Cultural Revolution of 1966-67 or the oil crises of the seventies, particularly when Hong Kong's major trading partners, Mainland China and the United States, were still growing strongly. It must be pointed out, unlike previous financial crises which had caused bank runs and multiple bank failures, there was no bank run. Indeed not a single bank failed this time.

It was sometimes pointed out that with the opening up of China Hong Kong's unique role as China's intermediary with the outside world was gone after 1997. An examination of Hong Kong's external trade in goods and services, however, indicates that while Hong Kong's exports growth in goods and in services did fall after 1997, Hong Kong actually did quite well relative to most countries. Hong Kong's decline in exports after 1997 has been much smaller than that suffered by such economies as Taiwan, Korea, United Kingdom, and the United States (See Table 1).

[1] Hong Kong started reporting official GDP statistics in 1961. It never reported a single year of negative growth until 1998. The average compound growth rate over the 1961 to 1997 period was 7.48%.

[2] Y.C. Jao, *The Asian Financial Crisis and the Ordeal of Hong Kong* (Westport: Quorum Books, 2001), pp. 137-167.

Table1: **Relative Trade Performance of Hong Kong before and after 1997**

Merchandise Exports Cumulative Growth Rates				*Services Exports Cumulative Growth Rates*			
	1998-2001	*1994-1997*	*% of Prior Performance*		*1998-2001*	*1994-1997*	*% of Prior Performance*
Hong Kong	9.27%	24.25%	38%	*Hong Kong*	18.93%	23.67%	80%
Japan	4.01%	6.03%	67%	*Japan*	3.03%	20.01%	15%
Korea	13.70%	41.82%	33%	*Korea*	19.23%	56.71%	34%
Malaysia	19.94%	33.81%	59%	*Malaysia*	23.11%	69.23%	33%
Philippines	9.24%	87.03%	11%	*Philippines*	-58.51%	124.18%	-47%
Singapore	10.79%	29.08%	37%	*Singapore*	38.36%	32.53%	118%
Taipei	10.85%	30.37%	36%	*Taipei*	21.88%	29.78%	73%
USA	7.13%	34.35%	21%	*USA*	10.66%	28.29%	38%
Canada	21.24%	29.66%	72%	*Canada*	7.88%	32.37%	24%
France	0.38%	20.58%	2%	*France*	-5.13%	7%	-73%
Germany	5.02%	20.13%	25%	*Germany*	-1.38%	34.23%	-4%
UK	-0.13%	36.73%	0%	*UK*	2.84%	41.91%	7%
Brazil	13.85%	21.70%	64%	*Brazil*	23.10%	13.93%	166%

Source:

World Trade Organization, *International Trade Statistics: Exports 1991-2001.* http://www.wto.org/english/res_e/statis_e/statis_e.htm

This paper makes the hypothesis that both the earlier economic miracle and the latter demise were due to what can be called the Henry George effect. The Henry George effect refers to the beneficial effects when land rent was available and relied upon to serve as the "staple" for fiscal revenue thus allowing a very low tax rate on incomes and consumption and the deleterious effects caused when land rent could no longer serve these functions. Prior to 1997, a strong property market, nurtured by a regime of low taxes and a policy that encouraged people to pour their savings into the housing market, gave much impetus to the economy and allowed entrepreneurs to obtain bank credit with relative ease using properties held as collaterals. Strong investment and consumption, sustaining economic growth even when exports growth was not so strong, caused an economic boom, further bolstering the run-up in property prices. Unfortunately, the Special Administrative Region Government did not realize the inevitability of property price increases during times of sustained prosperity and set out to increase land supply in an attempt to dampen

the price increase. At the same time it went about boosting homeownership by selling public housing at deeply discounted prices, without knowing that this would immediately reduce the flow of funds from the richer public housing tenants into the housing market. The result was a collapse in property prices that amounted to several years of Hong Kong's GDP. This destroyed an important source of fiscal revenue and also eroded the collateral values of properties. The resulting credit crunch also caused a dramatic shrinkage in the demand for office space, resulting in an even steeper decline in office rents and prices than residential rents and prices.

To test the thesis that misguided domestic policies largely accounted for the decline of the Hong Kong economy we examine several testable hypotheses. *The first testable hypothesis is that exports and interest rates drive property prices.* Strong exports boost incomes and low interest rates lower the cost of purchasing homes. An autoregressive distributed lag (ARDL) model shows that among residential property prices, exports, and interest rates residential property prices is the only variable that can serve as the dependent variable and the statistical relationship holds up quite well as a long term relationship (there is "cointegration" among the variables). The model fits extraordinarily well before 1997 but predicts poorly after, suggesting that for some exogenous reason earnings from the exports sector are not plowed into the housing market and government spending lost its ability to render Hong Kong more attractive to live and to invest in. *The second testable hypothesis is that property price movements drive movements in private domestic demand.* Again an ARDL model shows this to be the case over the long run. As this is the key relationship to explain Hong Kong's economic downturn, we additionally tested it with a Granger causality test. Both tests found that home prices bolstered private domestic demand when home prices were rising and led the domestic recession as home prices crashed. The Granger causality tests shows that the direction of causality really runs from home prices to domestic demand and NOT the other way round. The third hypothesis is that land rent played an important role financing Hong Kong's government expenditures. An ARDL model shows that home prices drive goverrnment

expenditures under a long-term relationship. Detailed statistical results are available from the author. Apart from these tests I have conducted, with other authors, other tests suggesting that a collapse in the prices for lower quality housing would spread to higher quality housing, and a collapse in the transactions for lower quality housing would lead to a collapse in the transactions in transactions for higher quality housing. These and other results are summarized in Table 2.

Table 2: **Summary of Statistical Results from Tests Performed**

Test	*Result*	*Where reported*
Test relationship between exports and home prices	Exports drive home prices, ARDL model before 1997 Actual home prices diverge from predicted values increasingly over time after 1997	See Appendix available from the author[3]
Test relationship between domestic demand and home prices	Domestic demand movements do not cause home price movements. Home price movements cause domestic demand swings. (Granger/Johansen and ARDL)	See Appendix available from the author
Test relationship between government expenditures and home prices	Home prices drive government expenditures, ARDL model.	See Appendix available from the author
Test relationship between lower tier home prices and higher tier home prices	Lower-tier home prices typically drive higher tier home prices but not the other way round.	Ho, Haurin, and Wong (2003)[4]
Test relationship between lower tier home transactions and higher tier home transactions	Lower-tier home transactions typically drive higher tier home prices but not the other way round.	Ho, Haurin, and Wong (2003)
Test relationship between Second Hand Private Home Transactions and Home Ownership Scheme "free market transactions"	Very significant positive relation found.	Yeung (2001)[5]

[3] The results can be downloaded from the website: http://www.ln.edu.hk/econ/staff/appendix(statisticaltests).pdf

[4] Lok Sang Ho, Donald Haurin, and Gary Wong, "Short run housing market dynamics: an application to Hong Kong," mimeo, 2003.

[5] Fai Yip Yeung, *A Study of the Impact of the Tenants Purchase Scheme (TPS) on the Hong Kong Housing Market and Economy*, M. Phil. thesis (HK: Lingnan University, 2001), p. 65.

Test causes of plunge in second hand home transactions	Regression shows Tenants Purchase Scheme has more significant and greater impact on second hand home transactions than the Asian Financial Crisis, lending credence to the hypothesis that TPS played a key role in "freezing" the housing market turnover.	Ho and Tse (2002)[6]
Test relationship between employment generation and change in second hand home transactions	Statistically significant positive impact.	Ho (2001)[7]

The idea that land rent provides the basis for a "single tax" for the financing of local government services owes to Henry George, the American social reformer who strongly argued against other forms of tax believing that they unavoidably would discourage entrepreneurship and effort. Henry George believed that a tax on rent would be economically efficient, and would generate sufficient revenue to cover *all* worthwhile expenditures of local governments.

This is not the place to prove the "Henry George Theorem." But we can explain the intuition briefly thus. With no explicit tax on the returns from investment or from effort, the incentives for investment and effort are enhanced. At the same time, the competitiveness of the economy for attracting investment and entrepreneurship is also enhanced. This is reflected in higher land and housing prices. The government captures the increase in land prices to finance its expenditures. To the extent that government spending is of the right kind in the sense that it serves the interest of the locality, benefits from such spending must exceed costs and so a tax on land rent must be large enough to finance worthy government expenditures.

[6] Lok Sang Ho, and Raymond Y.C. Tse, "Privatization of public housing: how it caused a deep recession in Hong Kong," mimeo, 2002.

[7] Lok Sang Ho, *Principles of Public Policy Practice* (Boston: Kluwer Academic Publishers, 2001).

Figure 1: **The Henry George Thesis**

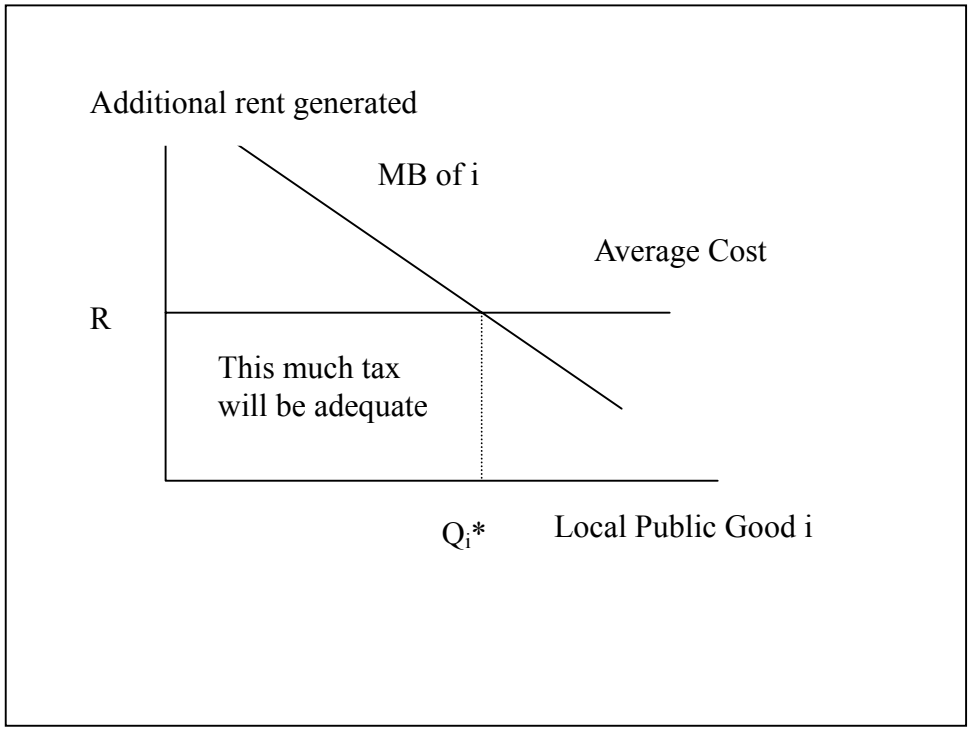


Figure 1 shows that, over-producing local public good i as well as under-producing it will reduce the net consumers' surplus and will therefore reduce the value of land rent. The optimal amount of the public good stands at Q*. Since the argument applies to all local public goods, we have the general conclusion that local governments have an incentive to stay efficient, producing only those local public goods that yield net benefits and in optimal amounts, if their fiscal system taxes nothing but land rent.

II. The Hong Kong Tax System

It is the hypothesis of this paper that Hong Kong before 1997 thrived because it effectively adopted a tax regime very close to the Henry George model. Land leases are auctioned from time to time. "Privately owned" land was therefore only leased from the government and not ownership in the sense of a "fee simple". Government rent (formerly Crown rent) is paid by the Government lessee (the 'owner') to the Government in return for the right to hold and occupy the land for the term (i.e. duration) specified in the land lease. New land premiums are due on expiry

of the old lease and when an application for more intensive use of the land than originally stipulated in the lease is approved. Developers' profits are subject to a moderate profits tax at 16.0 percent at the time of writing.

In Hong Kong, there is a tax called "rates." Rates are taxes levied on the "ratable values" of properties, the estimated annual rental values of properties (normally revalued yearly) at a designated valuation reference date. Rates are comparable to property taxes in North America. For the current Financial Year 2002-2003, the rates percentage charge is 5% and the designated valuation reference date is 1 October 2001. Rates are payable regardless of whether the property is owner occupied or let. In assessing the ratable value, reference is made to other open market rents agreed at or around the date of valuation, for similar properties in the locality, with due adjustments to reflect any differences in size, location, facilities, standards of finish and management. Rates or any tax levied against the estimated rental values of land represent a Georgian tax.

In practice a Georgian tax may be levied either on the stock value of land, or on the flow values of estimated annual rental incomes. It can be shown that the two approaches amount to the same thing in the absence of uncertainty. "Rates" in Hong Kong, like "property taxes" in North America, are levied on the appraised annual rental incomes of the property (implicit or otherwise). In the absence of such levies, the value of the land would have been higher, and the government would have collected a larger value at the land auction. In view of uncertainties, however, a tax on rental values seems to be superior to relying on the auction price to capture land rent. To investors, a fee simple auction exposes them to the risk of paying an excessively high price if the market over-estimates the annual land rent in the future. To the government that auctions the land, a fee simple auction also risks getting an excessively low price if the market under-estimates future land rents. If levies are placed on rental values, such levies will not rise unless rental values actually go up. It is therefore for a very good reason that Hong Kong's

land-based tax system consists of both a levy on the stock and a levy on the appraised rental income flow. Altogether the 2002-2003 valuation list includes approximately two million assessments comprising about 2.61 million units.

Apart from rates, many property owners pay an additional tax called Government rent after the handover of sovereignty in July 1997. Under the Sino-British Joint Declaration, otherwise non-renewable land leases which expired before 30 June 1997 were automatically extended up to 30 June 2047 without payment of an additional premium but with a new Government rent becoming payable from the date of extension. This provision also applies to other land leases granted since 27 May 1985, the date from which the Joint Declaration took effect. The assessment and collection of the new Government rent is governed by the Government Rent (Assessment and Collection) Ordinance (Cap. 515). The Government rent charged under the Ordinance is calculated at 3% of the ratable value of the property and is adjusted in step with any subsequent changes in the ratable value.

Table 3: **Government Revenue 1991-92 to 2001-02**

	1991-1992		1992-1993		1993-1994		1994-1995		1995-1996		1996-1997		1997-1998		1998-1999		1999-2000		2000-2001		2001-2002*	
	$m	%	$m	%	$m	%	$m	%	$m	%	$m	%	$m	%	$m	%	$m	%	$m	%	$m	%
Operating Revenue																						
Profits tax	25,195	22.0	32,248	23.8	39,858	23.9	47,430	27.1	46,706	25.9	50,063	24.0	55,347	19.7	45,252	20.9	37,699	16.2	42,969	19.1	44,500	25.6
Salaries tax	17,417	15.2	20,200	14.9	22,505	13.5	23,624	13.5	26,258	14.6	28,709	13.8	30,159	10.7	25,063	11.6	24,831	10.6	26,303	11.7	28,400	16.4
Personal assessment	1,028	0.9	1,309	1.0	1,565	1.0	1,759	1.0	2,817	1.6	3,617	1.7	4,433	1.6	4,098	1.9	3,216	1.4	3,455	1.5	3,900	2.2
Property tax	1,230	1.1	1,304	1.0	1,511	0.9	1,482	0.9	1,638	0.9	1,577	0.8	1,585	0.6	1,333	0.6	1,168	0.5	1,143	0.5	1,100	0.6
Direct tax revenue	44,870	39.2	55,061	40.7	65,439	39.3	74,295	42.5	77,419	43.0	83,966	40.3	91,524	32.6	75,746	35.0	66,914	28.7	73,870	32.8	77,900	44.8
Betting duty	7,110	6.2	7,818	5.8	10,082	6.0	9,352	5.3	11,051	6.1	12,191	5.9	13,453	4.8	12,228	5.7	11,938	5.1	12,630	5.6	11,380	6.5
Stamp duties	9,569	8.3	13,409	9.9	17,976	10.8	12,713	7.3	11,215	6.2	20,461	9.8	29,097	10.3	10,189	4.7	12,116	5.2	10,911	4.9	8,830	5.1
Other indirect taxes	1,727	1.5	1,785	1.3	1,962	1.2	1,136	0.7	1,225	0.7	1,900	0.9	1,713	0.6	987	0.5	778	0.4	760	0.3	870	0.5
Indirect tax revenue	18,406	16.0	23,012	17.0	30,020	18.0	23,201	13.3	23,491	13.0	34,552	16.6	44,263	15.7	23,404	10.9	24,832	10.7	24,301	10.8	21,080	12.1
General rates	3,494	3.0	4,423	3.3	4,461	2.7	5,156	2.9	5,806	3.2	6,285	3.0	6,258	2.2	3,614	1.7	7,132	3.0	14,428	6.4	12,400	7.1
Duties	6,844	6.0	7,216	5.3	7,113	4.3	7,583	4.3	7,899	4.4	8,450	4.0	8,465	3.0	7,698	3.6	7,377	3.2	7,293	3.2	6,910	4.0
Utilities	6,650	5.8	7,174	5.3	7,997	4.8	8,392	4.8	7,199	4.0	6,608	3.2	6,735	2.4	4,400	2.0	3,326	1.4	3,297	1.5	3,440	2.0
Fees and charges	7,170	6.3	8,015	5.9	8,627	5.2	9,562	5.5	9,879	5.5	10,766	5.2	11,279	4.0	10,565	4.9	10,896	4.7	10,973	4.9	10,970	6.3
Other non-tax revenue	9,557	8.3	12,587	9.3	12,714	7.6	13,986	8.0	13,345	7.4	14,566	7.0	20,902	7.5	19,708	9.1	17,941	7.7	17,642	7.8	18,740	10.8
Non-tax revenue	33,715	29.4	39,415	29.1	40,912	24.6	44,679	25.5	44,128	24.5	46,675	22.4	53,639	19.1	45,985	21.3	46,672	20.0	53,633	23.8	52,460	30.2
Investment income	2,982	2.6	1,767	1.3	3,387	2.0	4,942	2.8	5,910	3.3	5,616	2.7	14,982	5.3	31,648	14.6	36,778	15.8	19,516	8.7	0	0.0
Total Operating Revenue	99,973	87.2	119,255	88.1	139,758	83.9	147,117	84.1	150,948	83.8	170,809	82.0	204,408	72.7	176,783	81.8	175,196	75.2	171,320	76.1	151,440	87.1
Capital Revenue																						
Land sales	8,945	7.8	8,855	6.6	18,493	11.1	19,104	10.9	19,411	10.8	26,995	12.9	63,620	22.6	19,251	8.9	34,810	14.9	29,531	13.1	8,550	4.9
Other capital revenue	5,781	5.0	7,201	5.3	8,351	5.0	8,776	5.0	9,686	5.4	10,554	5.1	13,198	4.7	20,081	9.3	22,989	9.9	24,209	10.8	13,840	8.0
Total Capital Revenue	14,726	12.8	16,056	11.9	26,844	16.1	27,880	15.9	29,097	16.2	37,549	18.0	76,818	27.3	39,332	18.2	57,799	24.8	53,740	23.9	22,390	12.9
Total Revenue	114,699	100.0	135,311	100.0	166,602	100.0	174,997	100.0	180,045	100.0	208,358	100.0	281,226	100.0	216,115	100.0	232,995	100.0	225,060	100.0	173,830	100.0

* Data for 2001-02 are based on the latest forecast of the revised estimates, which have not been confirmed at the time of this report.

Source:

This and table is drawn from Final Report to the Financial Secretary, *Task Force on Review of Public Finances*, February 2002.

Table 3 presents the composition of government revenue from 1991/92 to 2001/02. We can see that land sales accounted for 6.6 to 22.6 per cent of total government revenue in the period up to and including 1997/98. In 1997/98, indeed, revenue from land sales alone was 63.6 billion dollars, while profits tax was 55.3 billion dollars. Stamp duties and general rates accounted for 29.1 billion and 6.26 billion dollars respectively. All of these dropped rapidly after 1997/98 with the property market crash—reversing their earlier rising trends.

Table 4 further lists out the estimated land-based revenues over the years. These estimates are based on reasonable assumptions regarding the land-based revenues among profits tax, rates, stamp duties, etc., and include the revenues from land development from government-owned enterprises like the Kowloon Canton Railway and the Mass Transit Railway Co. as well as the Housing Authority. It suggests that land-based revenues throughout the public sector account for an average of 60 per cent of Hong Kong's government revenue (though a considerably smaller percentage of public sector revenue).

Table 4: **Land Revenue as Percentage of Total Revenue**

	Total Direct Land & Property Related Revenue ($ m.)	*Total Indirect Land & Property Related Revenue ($ m.)*	*Total Land & Property Related Revenue ($ m.)*	*Government Revenue ($ m.)*	*Direct Land Revenue as % of Total Revenue*	*Indirect Land Revenue as % of Total Revenue*	*Total Land-based Revenue as % of Total Revenue*
1971/72	1131	236	1367	3541	31.9	6.7	38.6
1972/73	1983	346	2329	4936	40.2	7.0	47.2
1973/74	1213	598	1811	5241	23.1	11.4	34.6
1974/75	1210	525	1735	5875	20.6	8.9	29.5
1975/76	1486	590	2076	6520	22.8	9.0	31.8
1976/77	2096	772	2868	7494	28.0	10.3	38.3
1977/78	4776	956	5732	10233	46.7	9.3	56.0
1978/79	5340	1550	6890	12557	42.5	12.3	54.9
1979/80	7238	1994	9232	16796	43.1	11.9	55.0
1980/81	23524	3974	27498	30290	77.7	13.1	90.8
1981/82	22839	5135	27974	34313	66.6	15.0	81.5
1982/83	13080	4140	17220	31098	42.1	13.3	55.4
1983/84	8443	3166	11610	30400	27.8	10.4	38.2
1984/85	12811	3022	15834	36343	35.3	8.3	43.6
1985/86	15596	3793	19389	43695	35.7	8.7	44.4
1986/87	15340	5233	20574	48603	31.6	10.8	42.3
1987/88	20141	7754	27894	60877	33.1	12.7	45.8
1988/89	34593	9374	43967	72658	47.6	12.9	60.5
1989/90	24659	10506	35165	82430	29.9	12.7	42.7
1990/91	18389	11014	29403	89524	20.5	12.3	32.8
1991/92	48875	16654	65529	114700	42.6	14.5	57.1
1992/93	40804	23280	64084	135311	30.2	17.2	47.4
1993/94	98179	30641	128819	166602	58.9	18.4	77.3
1994/95	73575	28300	101875	174998	42.0	16.2	58.2
1995/96	103866	27614	131481	180045	57.7	15.3	73.0
1996/97	127587	35922	163510	208359	61.2	17.2	78.5
1997/98	158004	38446	196449	275220	57.4	14.0	71.4
1998/99	52003	23747	75750	207810	25.0	11.4	36.5
Total:	938781	299282	1238062	2096468	44.8	14.3	59.1

Source:

Compiled and estimated by the author from official sources.

III. The Georgian Tax and "High Land Price Policy"

There is an ongoing myth in Hong Kong that is called high land price policy. This myth had persisted for at least a quarter of a century prior to the transfer of sovereignty. Despite the supposedly outrageous land prices in the early 1970s, land prices continued to rise spectacularly right through 1997. Then "the bubble burst." Today many Hong Kong people still blame the colonial government for perpetrating the policy, thus causing the bubble that has become the curse of Hong Kong after 1997.

As indicated in the earlier section, producing high land prices through low tax rates and producing the right mix and the right levels of local public goods is in the interest of the community. But a high land price policy through artificially restricting land supply is not. The optimal supply of land for development obtains when the marginal benefit of the supply is equal to the marginal cost. While the government had very much depended on land for its revenue, there has not been an artificially created shortage of land, contrary to what is commonly believed.[8] Indeed, no government can artificially boost land prices and keep it rising for thirty years against economic fundamentals.

According to George a tax on land rent will not increase the total cost of land for users. The tax only changes the distribution between the landowner and the government. Any increase in land rent tax will reduce the rent captured by the landowner. Conversely, a decrease in land rent

[8] A memorandum under the Joint Declaration signed in December 1984 provided that, excluding land granted to the Housing Authority for public housing construction. no more than 50 hectares of land should be sold or otherwise made available through land grants every year. But actual supply of land had always exceeded this stipulated amount. Further additional supply of land was possible through modifications of land use. See also Table 6.

tax will, other things being equal, benefit the landowner. Users would be indifferent about who collects the land rent.

But other things are not equal. If the tax on land rent replaces a tax on incomes, particularly incomes from entrepreneurship and on labour, enterprise and work will be enhanced. This will boost productivity growth, economic growth, and will lend further support to land values.

As a monopoly supplier of land, the government can restrict land supply and boost land prices relative to a regime without that supply restriction. But this increase in land prices is a one-off event and should not translate into a year-in, year-out increase.

What is then the driving force behind the spectacular and secular increase in property values over the three decades to 1997? Does this represent a bubble that had to burst sooner or later?

The factors are many. Commonly cited factors include Hong Kong's low tax rates, the relative political and social stability of Hong Kong, an efficient civil service, the rule of law and efficient market institutions, strong economic growth, and inflation. Of these factors, low tax rates is linked to the use of the Georgian tax as a key source of Hong Kong's revenue. The vibrant economy prior to 1998 can also be attributed to the Georgian avoidance of taxing entrepreneurial profits and the Georgian incentive for the government to supply only the rent-enhancing local public goods. While all these factors are positive for the long term prospects of the economy high inflation was not. High inflation had been a worrying factor since 1990 and was obviously a destabilizing factor, even though it started a clear downward trend after 1991.[9]

[9] Lok Sang Ho, "Inflation: new risks for the Hong Kong economy," in Stephen Cheung and Stephen Sze (eds.), *The Other Hong Kong Report* (HK: Chinese University of Hong Kong Press, 1995).

If the Georgian thesis is right, Hong Kong would enjoy faster economic growth by virtue of the unleashing of entrepreneurship and productivity,[10] and faster land value increases than other economies on account of the strong economic growth and the high savings/investment rate. Low tax rates would encourage people to invest and to save. The prospect of rising land and property values would also encourage people to invest in properties. Meanwhile, the government would collect sizable revenues that would allow it to provide local public goods that would further enhance land prices.[11]

The result of the "stability and prosperity" will be high and rising land prices. A key question is whether this constitutes a bubble.

What is a bubble? A bubble must be a price inflation that cannot stop until it bursts—leading to a collapse in the prices. Prices in general will rise and fall. In particular, speculation may cause prices to overshoot and then a large correction may take place. But these normal increases and declines are *not* bubbles. To qualify as a bubble the price movements must be fueled by false expectations ("irrational exuberance" as Alan Greenspan called it and as Shiller so titled his book) and by excessive lending that cannot be sustained. While there were obviously a high degree of "irrational exuberance" prior to 1998 excessive lending by banks and other

[10] Chou and Wong using an improved method of estimation found total factor productivity growth in Hong Kong to be much more impressive than suggested by studies such as A. Young, "A tale of two cities: factor accumulation and technical change in Hong Kong and Singapore," in O.J. Blanchard and S. Fischer (eds.), *NBER Macroeconomics Annual*, (Cambridge, MA: MIT Press, 1992), pp. 13-54. By directly accounting for and controlling the effects of factor accumulation, they found total factor productivity growth over the 1967 to 1996 period ranged from 3.86 to 5.86 per cent per year. See Win Lin Chou and Kar-yiu Wong, "Economic growth and international trade," *Pacific Economic Review*, Vol. 6, No. 3 (October 2001), pp. 313-329.

[11] The government had been collecting stamp duties and profits tax beyond expectation prior to 1997. In addition, Mingpao reported that from 1992 to 1996 there were 30,000 cases of speculative transactions and the Inland Revenue Department had successfully collected $2 billion of taxes from 20,000 cases. It would try to track down the remaining 10,000 cases. The average gains per case amounted to $600,000 resulting in $100,000 of taxes. Mr. Wong Ho Sang told the Democratic Party that profits taxes from speculative transactions in properties stood at a yearly rate of 400 million dollars or less than one per cent of total profits tax. Mingpao, Jan. 18, 1997.

financial institutions was conspicuously absent. Banks typically under-appraised property values and, according to the guidelines announced by the Hong Kong Monetary Authority, lent no more than 70 per cent of the appraised values. In addition many banks require a guarantor in addition to holding the mortgaged property as collateral. This explains why despite the huge drop in property prices not a single bank failed in the wake of the collapse of property prices.

IV. The Dynamics of Land Price Increases

People refer to bubbles when they observe a rapid rise in the prices of assets followed by a major collapse in the same prices.[12] The phenomenon is called a bubble because it is believed that the fundamental economic factors do not warrant the highly inflated prices which then have to fall back to realistic levels.

Analytically, prices are determined by supply and demand. To say that a price increase is a bubble would have to mean that the price increase is temporarily sustained by factors that cannot last. As explained earlier on, one factor may be over-zealous bank credit that fuels the demand. Such lending cannot keep expanding because it will eventually create too much exposure to risks for the lenders. Another factor may be that the purchasers are in a state of "irrational exuberance," as Alan Greenspan described of the equity market in one of his Congressional

[12] Okina et.al. recognized that different people use the term "bubble" to mean different things. For their purpose they characterized the "bubble economy" by three factors: a rapid rise in asset prices, the overheating of economic activity, and a sizable increase in money supply and credit. (p. 397) See Kunio Okina, Masaaki Shirakawa, and Shigenori Shiratsuka, "The asset price bubble and monetary policy: Japan's experience in the late 1980s and the lessons," *Monetary and Economic Studies* (Special Edition), Vol. 19, No. S-1, (February 2001), pp. 395-450.

testimonies. Irrational exuberance is a state of mind that cannot be sustained over a long stretch of time.

Still another factor may be the "cobweb" effect of delayed supply increases. If developers are prompted by highly profitable prices to overproduce, and if production takes time so that and if production takes time so that the overproduction has plenty of time to build up, the excess supply will eventually depress prices. The larger the overproduction, the greater will be the price decline and the longer will it take for the market to recover.

These factors can interact, so that people in a state of irrational exuberance may want to borrow to buy the inflated assets, while the sharply pushed up prices will induce more housing starts. There is some evidence that these factors were at work in Japan. Okina, Shirakawa, and Shiratsuka[13] found "extremely aggressive" behavior among financial institutions after 1987-88, which was prompted by financial deregulation on the one hand and declining profitability on the other. They also found considerable monetary easing interacting and mutually reinforcing with a strong equity and land market. The speculative pressures on land prices were further exacerbated by tax laws that discouraged transactions and thus held back supply and weak or faulty corporate governance that failed to counterbalance the aggressive behaviour of banks and firms. To describe a price increase as a bubble implies there exists dynamics that causes the formation of the bubble and eventually its collapse. The story told by Okina *et.al*. appears to fit this description.

How about Hong Kong? Banks were not aggressive in their lending activities before the collapse, and there was no sign of oversupply through 1999—two years after home prices started

[13] ibid.

to plunge. Apart from conservative appraisal values and a 60% to 70% loan to appraised value ratio depending on whether the property is a luxury home, and the frequent requirement of a guarantor—the mortgage interest rates charged by banks were set at prime plus up to 2 per cent, an extraordinarily high rate in comparison with what is charged in North America. Money supply M2 grew at an average annual rate of less than 15 per cent in the 1990-97 period, which is less than half of the rate that prevailed in the 80s. Regulators were wary about excessive speculation and had introduced policies to curb speculation. In particular, in Mid April 1994 a Task Force on the Supply of Land and Property Prices was set up with the specific objective of coming up with measures to curb speculation and stabilize property prices. It was noted that about 10% of sale and purchase agreements presented for stamping in the two years between February 1992 and March 1994 involved short-term resales. About 23% involved new properties offered for sale after 31 January 1992. About 18% of the units in large developments completed in 1992 were still vacant at the end of April 1994, i.e. over a year. These figures were regarded *prima facie* evidence of speculation and hoarding. In response to such evidence the Task force introduced, among others, the following measures:

- Since the arrangement of private sales is widely believed to have fuelled speculation, the Task Force lowered the quota to 10%. and disallowed re-sale before the Certificate of Compliance or the consent to assign was given, whichever earlier.
- To reduce the opportunities for speculation, forward sales was reduced to not more than nine months before the completion date to be specified in the Sale and Purchase

Agreement. No re-sale was be allowed before the Certificate of Compliance or the consent to assign is given, whichever earlier.

- To increase the cost to speculators the initial deposit was fixed at 10% of the purchase price and 5% would be forfeited if the purchaser failed to sign the formal sale and purchase agreement or entered into a Cancellation Agreement with the developer.
- To exercise control over pre-sale of flats from redevelopment, the Consent Scheme would be extended to cover substantive modifications and exchanges involving residential accommodation.
- The Legal Advisory and Conveyancing Office would step up monitoring of the Consent Scheme and a coordinated information system would be established to monitor speculative activities in the market.
- The Administration promised to examine legislative measures to dampen speculation and consider the Law Reform Commission's proposals on legislation relating to sales descriptions.

Notwithstanding these measures, housing prices resumed their apparently relentless climb after a brief though significant decline in 1994-95. It is important to find the reasons behind this strength in housing prices and to determine if it was a problem, the extent of the problem if it is a problem, and the extent to which it represented an increase in rent reflecting the benefits of local public goods and other local external economies generated by the natural development of the society.

To do this we need a model of the housing market and fit it to the Hong Kong situation. We need to recognize, first, that housing consists of a whole spectrum of dwelling units that range from very modest homes to luxurious flats and houses. They are located in locations with different degrees of access, amenities, and attractions. To simplify the analysis, we can see housing as consisting of units that fit into different tiers of qualities. Housing with neighboring qualities are good and valid substitutes for households of a given socio-economic class. Housing with a much lower quality is not a substitute because the quality is too bad. Housing with a much higher quality is not a valid substitute because the cost is too high.

Table 5-1 **Mean Monthly Household Savings by Type of Living Quarters by Income Group (1989/90)**

Income Group	*Mean Household Savings (HK $, Monthly)*				
	PRH	*HOS*	*PRR*	*POR*	*Overall*
Bottom 25%	-503	n.a.	-174	-631	-451
25-49%	714	-277	-6	202	425
50-74%	2924	1880	2187	2410	2499
75-89%	6459	3552	5788	4989	5212
Top 10 %	16635	15746	17915	14770	15845

Table 5-2: **Mean Monthly Household Savings by Type of Living Quarters by Income Group 1994/95**

Income Group	*Mean Household Savings (HK $, Monthly)*				
	PRH	*HOS*	*PRR*	*POR*	*Overall*
Bottom 25%	-713	-2091	-724	-2773	-1041
25-49%	2059	396	469	439	1221
50-74%	6749	4103	1445	4225	4621
75-89%	15716	11700	10981	12365	12565
Top 10 %	40933	26217	26117	28229	27929

Source:

Household Expenditure Survey 1989/90, 1994/95, Census and Statistics Department, reported in Mariko Watanabe, *The Impact of the Public Housing Policy on Household Behaviour in Hong Kong*, M. Phil. thesis (HK: University of Hong Kong, 1998), table 6.6.

In Hong Kong about 40 per cent of the population lived in public rental housing prior to 1997. The households living in public rental housing are known to be great savers, as indicated in Table 5-1 and Table 5-2. With huge savings accumulated through the years they began investing in the local housing market actively, particularly after 1987, when the government introduced a policy to make the richer tenants pay higher rent. This activity bid up prices for lower tier housing, whose owners then became able to offer attractive bids for higher-tier housing. Owners in these higher-tier housing in turn could trade their homes for still better housing. Thus the infusion of money into the housing market increased housing market turnover and buoyed up the entire market, resulting in a multiple increase in asset values. Causality tests run by the author and others indeed indicated that the housing market turnover of lower tier housing preceded that of higher tier housing. As well, other statistical tests indicate that higher prices of lower tier housing apparently caused higher prices of higher tier housing.[14] (Table 2) There is evidence of active participation by public rental housing tenants in the housing market. For example, the Housing Authority reported that a survey conducted in 1992-93 revealed that some 24 per cent of home purchases were by public housing tenants.[15]

Of course, public housing tenants did not have to invest in housing in Hong Kong. The fact that they did suggests that the pre-1997 Hong Kong was attractive for them to invest in Hong

[14] See Lok Sang Ho, Donald Haurin, and Gary Wong, "Short run housing market dynamics: an application to Hong Kong," mimeo, 2003.

[15] "In the Mid-Term Review Report, it was revealed that about 13% of PRH tenants or 74 000 out of 580 000 households covered by a survey in July 1993 owned private domestic properties. Another survey on tenants in North Point Estate showed that 18% of them owned private domestic properties in the urban areas alone. Some one-third of these households owned more than one property and a small number even owned up to five properties. An independent exercise revealed that PRH tenants accounted for as much as 24% of all purchases of private flats by local individuals in the period October 1992 - March 1993. The survey results point to the prevalence among PRH tenants in private property ownership." See: Final Report on the Mid-term Review of the Long Term Housing Strategy, Hong Kong Housing Authority.

Kong's residential market. Similarly, there was anecdotal reports for speculative money flowing into Hong Kong from the Mainland and from South East Asian countries helping to boost prices. The large injection of money, from local savers as well as from overseas, may be attributed to speculation, or may be attributed to a recognition that Hong Kong's unique position relative to a rapidly growing Mainland, together with its excellent infrastructure, political and social stability, commitment to low tax rates, a workforce with excellent work ethic, etc. There is nothing wrong with the latter. Indeed, that is exactly the result expected when the economy adopts an efficient Georgian tax. There are, of course, risks associated with speculation. But as long as banks do not over-lend, market excesses should be corrected, just as they have been corrected time and again prior to 1997. Historically, Hong Kong had for example seen speculative excesses in the late seventies that stretched affordability to the limit, with home prices roughly tripled from 1976 to 1981. Without excessive lending, without excessive building, in a stable policy environment, however, there should be no worry for a catastrophic bubble.

Yet prices did plunge and failed to recover after 1997. It was the official story that the Asian Financial Crisis (AFC) caused the bubble to burst. Yet apart from the coincidence in timing there is just no convincing mechanism for the Asian Financial Crisis to explain the relentless decline in housing prices after 1997.

It is true that the AFC had caused the stock market to lose about a half of its value in the months from August 1997 to January 1998, and it is true that inter-bank interest rates shot up to

over 280 per cent briefly in October 1997.[16] But Hong Kong had seen declines in the stock market amounting to 90 per cent from 1973-75. The economy nevertheless registered positive growth in every year from 1963 right through 1997. It also always recovered strongly every time, thus giving Hong Kong the legendary reputation of resilience. While inter-bank interest rates did jump to very high levels in 1997 mortgage rates never rose beyond 12 per cent—at a time inflation was still running in excess of 5 per cent. It is to be noted that unlike previous financial crises that had multiple bank failures, not a single licensed bank failed during or in the wake of the Asian Financial Crisis.

The collapse in housing prices can be attributed to two principal causes, one relating to a policy that dramatically sapped demand, the other related to a policy that dramatically pushed up supply. Both policies were really not warranted at the time, with or without the AFC. The policy that dramatically sapped demand is the Tenants Purchase Scheme (TPS), a policy that effectively reversed the "richer tenant pay higher rent" policy that prevailed before its launch and one that immediately reduced the attractiveness for rich tenants to buy Home Ownership Scheme housing[17] or private housing. This TPS offered sitting tenants an opportunity to buy their own units at as much as 88 per cent discount from the estimated market price. Given this offer, the prices of HOS housing looked ridiculously expensive. Predictably, thousands of HOS buyers gave up their deposits in 1998 in the wake of the announcement of TPS. This has never happened before. Indeed, buyers had always regarded winning the opportunity to buy HOS housing as

[16] Y.C. Jao, *The Asian Financial Crisis and the Ordeal of Hong Kong* (Westport: Quorum Books, 2001), p. 61.

[17] Home Ownership Scheme (HOS) housing is a subsidized homeownership scheme run by either the Housing Authority or the Housing Society since 1978. In 1997, about 13 per cent of Hong Kong's population live in HOS housing. HOS housing constituted 11.3 per cent of the permanent housing stock in 1997.

winning a lottery ticket. When HOS housing prices collapsed, their owners could no longer offer the kind of prices that they had been paying to trade up to private housing. Private housing prices therefore collapsed. More importantly, turnover dropped dramatically because sellers not aware of the fundamental change continued to ask now unrealistic prices. Developers, however, were fully aware of the shrinkage in demand and slashed prices aggressively.

This took place early 1998, when no excess supply was visible. By 2000, however, the effects of an excess supply that was part of the policy to dampen property prices set in. (See Table 6) The dramatic increase in supply was deliberate but it was not warranted--with or without the Asian Financial Crisis, notwithstanding the large run-up in housing prices prior to 1998, because there was never a physical shortage.

We have done a number of statistical tests to test (1) the Georgian hypothesis that run-up in home prices prior to 1997 was driven by an efficient government that inspired confidence and increased Hong Kong's attractiveness, and by strong export performance, and (2) the hypothesis that the so-called "collapse of the property price bubble" is policy-driven. (Table 2) Paradoxically, however, the greatest plunge of housing prices occurred in 1998, when the supply of new housing was relatively small. It is the hypothesis of this author that the very low prices at which public housing tenants were offered to buy their own units had a great role to play here. The Tenants Purchase Scheme, overnight, rendered HOS housing suddenly totally unattractive. Table 7, which shows the magnitude of profits made by some TPS owners who sold their units over a period of rapidly falling overall home prices, testified to the extremely low prices that had allowed TPS buyers to reap huge gains while the housing market languished. Table 8, which

shows that the 1997 prices of some HOS units sold in the "secondary market" to "green form applicants," who were essentially public housing tenants, were extraordinarily high. This lends support to the hypothesis that public rental housing tenants were lending support to the high prices that prevailed before the end of 1997.

Table 6: **Number of Households and Housing Stock (1987- 2001)**

Year	*No. of Households*	*Housing Stock Private Housing*	*Increase in Private Housing*	*Subsidize Sale Flats*	*Pubic Rental Housing*	*Increase in Subsidized Housing*	*Total Housing Stock*	*Household minus Housing Stock*
1987	1496.1	770		79	580		1429	67.1
1988	1532.6	804	34	84	596	21	1484	48.6
1989	1549	832	28	94	620	34	1548	1
1990	1559	864	32	114	651	51	1630	-71
1991	1603.1	884	20	131	667	33	1682	-78.9
1992	1640	919	35	147	680	29	1744	-104
1993	1677.7	946	27	162	673	8	1781	-103.3
1994	1729.1	962	16	182	679	26	1822	-92.9
1995	1783	1003	41	192	689	20	1884	-101
1996	1864.5	1030	27	210	693	22	1932	-67.5
1997	1922.8	1040	10	224	698	19	1961	-38.2
1998	1961.5	1056	16	242	706	26	2004	-42.5
1999	1998.9	1072	16	288	682	22	2040	-41.1
2000	2037	1099	27	327	688	45	2114	-77
2001	2078.4	1153	54	377	694	56	2224	-145.6

Source:

1. Data on number of households are obtained from the "Hong Kong Social and Economic Trends", various years, Census and Statistics Department, Hong Kong.

2. Data on housing stock are obtained from the Housing Department, SAR Government, http://www.housingauthority.gov.hk/eng/hd/stat_01/mid_f.htm

Note:

1. Data on the number of households are the averages of the statistics for the four quarters of the years obtaining from the General Household Survey.

2. Stock of permanent residential flats are as at end March.

Table 7: **Profits from Sale of TPS Units**

Name of Estate	*Unit*	*Purchase Date*	*Purchase Price $'000*	*Resale Date*	*Resale Price $'000*	*Profit %*
Wah Kwai	Block 2 high	July 1998	317	May 2001	920	190
Cheung An	Block 8 mid	June 1998	209	Jan. 2002	600	187
Wah Kwai	Block 2 high	Feb. 1999	310	Dec. 2001	880	185
Cheung An	Block 2 high	July 1998	234	Oct. 2001	600	156
Wah Kwai	Block 2 high	July 1998	346	Sept.2002	880	154

Source:

Centaline Property Agency and the Land Registry, cited in Apple Daily Feb. 2, 2003.

Table 8: **Actual Transactions of HOS Units in the Secondary Market, Fu Keung Court***

Usable floor area	*High, Middle, or Low Floor*	*Date of Agreement to Purchase*	*Price HK$ million*	*Land Premium Discount Rate (%)*
644	Middle	09/1997	3.95	29
644	High	11/1997	3.60	29
645	Middle	04/1998	2.56	29
645	Middle	10/1998	1.98	35

* Fu Keung Court in Wang Tau Hom. Sellers do not have to pay the land premium discount when they sell in the secondary market that is restricted to public housing tenants. The buyer will however have to repay the land premium discount upon resale in the future. The land premium discount is calculated from the formula (Market Price – Sale Price)/Market Price at the time of original purchase.

Source:

Downloaded from Housing Authority website.
http://www.housingauthority.gov.hk/chi/hd/hos/s_market/index.htm

V. Policies to Redress the Problem

The SAR government was aware of the negative effects of the dramatic declines of housing prices on the economy and obviously sought to redress the problems in its first budget, announced in March 1998. But it was totally unaware of the implications of the housing market collapse on its fiscal position. The official budget summary stated confidently that "Hong Kong's tradition of prudent fiscal policies is being maintained. We will continue to maintain strong reserves to guard

against future uncertainties, not run up debts. Overall growth in Government spending over time will be kept within rate of growth in the economy." As things turned out, however, the government's fiscal position deteriorated dramatically and by 2002 is running fiscal deficit about 5 to 6 per cent of the GDP.

The 1998 budget must be the most stimulative budget in all of Hong Kong's history. The official summary put it succinctly: "the 1998 Budget has cut taxes by $13.6 billion for the 1998-99 financial year and by nearly $100 billion up to 2002-02…. Total public expenditures will increase by 11.2 per cent." Homeowners were offered an unprecedented $100,000 mortgage interest allowance to be deducted from taxable income each year for up to five years. Basic allowances were increased 8 per cent while child allowances and allowances for dependent brother/sister were increased by 11.1 per cent. Single parent allowance was increased by 44 per cent. The annual depreciation allowance for commercial buildings was doubled. The profits tax rate was reduced by 1/2 percentage point to 16 per cent. Rates were cut from 5% to 4.5%. Notwithstanding this dramatic fiscal stimulation, however, the economy suffered an unprecedented shrinkage of 5.1 per cent.

By the end of May 1998, the government announced officially that the price decline in housing prices was enough. The Secretary for Housing, Mr Dominic Wong, said that "the Government has reviewed residential property market developments in recent months and has noted that the highly inflated value of property in Hong Kong has come down substantially as a result of the monetary crisis and the economic downturn affecting many parts of South-East Asia". "We have therefore reviewed the series of anti-speculation measures introduced under the Consent

Scheme in mid-1994 and the beginning of 1997, and have concluded that some relaxation is desirable." "We have decided to extend the pre-sale period of uncompleted flats from the present 15 months to 20 months before the estimated date of completion of the development project," Mr Wong said. "Property developers can now take advantage of the longer pre-sale period to sell flats earlier, thus reducing interest cost and improving liquidity. The extended period will also provide wider choice of flats to home buyers."

Four measures previously introduced to curb speculation were suspended with immediate effect. In particular, the prohibition of resale of uncompleted flats before assignment is suspended. "The measure was introduced a few years ago in order to clamp down on excessive speculation in the primary market. Speculative activities have now subsided. We feel that the measure can be suspended under the present climate to allow the market to operate more freely and to give home buyers greater flexibility in responding to current market conditions. This measure will help particularly those purchasers who are in the process of trading up to seek a better home and have faced financial difficulty in keeping two flats." Secondly, limiting flat sale to companies to the last 15% of each batch of flats for pre-sale is suspended. This measure was originally designed to benefit individual buyers by giving them priority to buy flats in situations of over-subscription and to clamp down on speculation through shell companies. This measure is not necessary now as the proportion of company purchasers is consistently well below 15%. Thirdly, the requirement of developers to put all flats for pre-sale onto the market within six months of the date of consent given is suspended. This measure is considered unnecessary under the current market conditions as developers are now keen to sell flats earlier. Fourthly, the requirement of

developers to put onto the market not less than 20% of flats approved for pre-sale for each batch of flats for pre-sale is suspended. This will allow developers greater flexibility in the pricing and sale of flats under the prevailing cautious market sentiment. In view of the recent slowdown of the market and in addition to the relaxation announced, the Government will also consider, on a case by case basis, applications for exemption from the requirement to conduct balloting in the pre-sale of higher value flats," Mr Wong said. "This will give developers greater flexibility to market higher value flats under current market conditions. As this relaxation will be applicable only to a very small number of projects, the sales procedure of most development projects targeted at the mass market will not be affected." "The new arrangements will also apply to those development projects for which consent for pre-sale has been given," Mr Wong said. "Overall, the arrangements will have a positive impact on the property market. We will monitor the effect of relaxation to ensure that the property market will continue to operate in good order. They will be reinstated if such order is disturbed in future," Mr Wong confidently stated. (press release dated Friday, May 29, 1998)

From an analytical point of view, all of these measures were really beside the point, while the reference to “prudent fiscal policy” was totally unwarranted, given the policies to dramatically increase housing supply and the policies to dramatically reduce housing demand, and given the dramatic decline in fiscal revenue to be expected with a property market slump. Predictably, the government runs into structural deficits that can hardly be redressed through tax increases or spending cuts. Indeed, tax increases and spending cuts would aggravate the problem of inadequate aggregate demand to sustain full employment and will perpetuate a vicious circle of

recession-deflation, while spending cuts to the extents required to address the problem would generate social distress and unrest.

It took four years for the SAR government to realize its policy errors. On November 13, 2002, the new Secretary for Housing, Planning, and Lands, Mr. Michael Suen, announced a nine-point package that for the first time addressed the real problems besetting Hong Kong. These measures include:

- suspension of periodic land auctions for an indefinite period and suspension of land sales through the Application List through the end of 2003;
- both the KCR and the MTR will suspend land development tenders along their routes through the end of 2003; in the future property development by the railway companies will be subject to coordination by the government;
- public housing applicants will have the option for rental subsidies in lieu of being offered a subsidized rental flat; in the next few years a yearly production of over 20,000 units of public rental housing will be maintained;
- indefinite suspension of sale and development of Home Ownership Scheme housing; outstanding stock will not be sold and will be converted into alternative uses such as rental housing;
- the home purchase loan scheme will continue;
- all housing development projects involving mixed public and private units will be suspended; for sale housing development by the Housing Society and the Private Sector

Participation Scheme will be suspended; all outstanding stocks will be converted to alternative uses;

- the Tenants Purchase Scheme will be suspended after the last and the sixth phase to be launched in 2003;
- the government will amend legislation to encourage investment in private rental housing;
- abolition of the two remaining anti-speculation measures introduced in the early 90s not yet abolished. These included restrictions imposed on internal sales and the requirement that buyers may buy no more than one residential unit and two parking spaces.

VI. What Lies Ahead

There is no doubt that Mr. Michael Suen, the Secretary for Housing, Planning and Lands, understands the way the housing market works. He said that the present regulations defining the rich tenants not qualified for further subsidies as three times the wealth qualifying limit and 84 times the income qualifying limits for public rental housing application were too lax. He explicitly said it would be desirable if the richer tenants could move out thus vacating the units, allowing those in the queue to move in. He told the press that the current practice of not reviewing the economic status of tenants until tenants had moved in after 10 years was out of date. (Oriental Daily, January 28, 2003) Mr. Suen repeated in his many public appearances after he

announced his 9-point measures that the government would "withdraw from the market" and would allow the free market to work.

The nine measures of Michael Suen were the right steps in the right direction. However, Hong Kong must now face the huge outstanding surplus stock of housing already built and in the pipeline. It is clear that if this huge stock is unloaded to flood the market, the prices of flats will fall drastically. Unlike the prices of vegetables, however, when the prices of new flats decline, not only will the producers of the good (farmers and developers) suffer, but also will homeowners. For homeowners already facing the problem of negative equity and the risk of losing their jobs, further erosion of housing prices force them to curtail their spending and to cut investment. Traditionally, the owners of many small and medium enterprises rely on mortgaging their homes to obtain credit and thus working capital. Now that home prices are falling and falling, no wonder business activity also fall greatly. By 2003 housing prices had already lost over 65 per cent of their peak values. Further declines not only hurts the one million plus homeowners, but also eliminates jobs, creates more bankruptcies, and ultimately threatens the health of Hong Kong's banks. It is worrying that a hands-off attitude toward the cutthroat competition to unload flats might further ruin the economy and eliminate any chance for its quick recover.

Provided that Hong Kong's developers understand the gravity of the situation as well as the fact that the new policies have now made it possible for the housing market to recover, and thus refrain from dramatically slashing prices, the Hong Kong economy will revive faster than most people expect, and the housing market will revive its former vibrancy—though prices will take many, many years to come near their peak prices reached in 1997. But can Hong Kong take

chances that developers will do so? It is imperative that the government does something effective and does so soon.

Appendix for Statistical Tests: Model Specification and Methodology

There are three basic hypotheses that we have to test statistically. The first is that exports and interest rates drive housing prices under a long term relationship through 1997. The second is that housing prices movements drive domestic private economy fluctuations, and that this long term relationship holds before 1997 as well as after. The third is that housing prices drive government expenditures on goods and services. Again this relationship is hypothesized to hold before 1997 as well as after. Domestic private demand consists of the sum of domestic private consumption and domestic private investment. Government expenditures on goods and services includes government consumption as well as expenditures on infrastructure investment. These relations can be summarized by the following equations:

$LnPPI = \alpha_1 + \beta_1 LnEX + \gamma_1 LnPR + \varepsilon_t$ ---------- (1)
($\beta_1 > 0$, $\gamma < 0$)

$LnD = \alpha_2 + \beta_2 LnPPI + \varepsilon_t$ ----------(2)
($\beta_2 > 0$)

$LnG = \alpha_3 + \beta 3 LnPPI + \varepsilon_t$ ----------(3)
($\beta_3 > 0$)

where α is the intercept term, LnPPI is the residential property price index, LnEX is the total export of goods and services, LnPR is the prime lending rate, LnD is the private domestic demand, LnG is the government expenditure, all in logarithm form. ε is the error term. Details of variables definition and sources are given in the Annex to this Appendix. The Sample periods are, unless otherwise specified, from Q1 1984 to Q3 2002.

To establish the long-run relations for the above three equations, we employ the autoregressive distributed lag (ARDL) approach to cointegration introduced by Pesaran *et. al.* (1996). This approach, unlike the Johansen's procedure which requires all the series are integrated of the same order, provides an alternative for examining the cointegrating relation of the underlying variables regardless of whether the series are I(0) or I(1) and so we can dispense with the need for

pre-testing for unit roots. The error correction version (EC) of the ARDL model for Equation (1), (2) and (3) are given by:

$$\Delta LnPPI_t = \alpha_o + \sum_{i=1}^{n} \delta_i \Delta LnPPI_{t-i} + \sum_{i=1}^{n} \beta_i \Delta LnEX_{t-i} + \sum_{i=1}^{n} \gamma_i \Delta LnPR_{t-i} + \theta_1 LnPPI_{t-1} + \theta_2 LnEX_{t-1} + \theta_3 LnPR_{t-1} + \varepsilon_t$$

----------(4)

$$\Delta LnD_t = \alpha_o + \sum_{i=1}^{n} \delta_i \Delta LnD_{t-i} + \sum_{i=1}^{n} \beta_i \Delta LnPPI_{t-i} + \theta_4 LnD_{t-1} + \theta_5 LnPPI_{t-1} + \varepsilon_t$$

----------(5)

$$\Delta LnG_t = \alpha_o + \sum_{i=1}^{n} \delta_i \Delta LnG_{t-i} + \sum_{i=1}^{n} \beta_i \Delta LnPPI_{t-i} + \theta_6 LnG_{t-1} + \theta_7 LnPPI_{t-1} + \varepsilon_t$$

----------(6)

The ARDL approach consists of several steps. To begin with, we carried out a stability tests for investigating the existence of a long run relationship. The null hypotheses for the statistical tests, namely that no cointegrating relationship exists between the variables, can be stated as follows:

H_{o1}: $\theta_1 = \theta_2 = \theta_3 = 0$

H_{o2}: $\theta_4 = \theta_5 = 0$

H_{o2}: $\theta_6 = \theta_7 = 0$

The null hypotheses can be tested by the F-statistic. Note that this statistic has a non-standard distribution irrespective of whether the series are I(0) or I(1). Two sets of asymptotic critical values (CV) - the lower bound CV (assuming all the variables are I(0) and the upper bound CV (assuming all the variables are I(1)), are computed by Pesaran et al. (1996). If the computed F-statistic for the test lies above the upper bound, then the null of no cointegration can be rejected and we can conclude that a long-run relationship between the variables does exist. If the test statistic falls below the lower bound, then the null cannot be rejected. If the test statistic

falls in between the bounds, then the result is inconclusive. Once the existence of long-run relationship is confirmed, the ARDL model is then applied to estimate the coefficients of this long-run relation and we can derive the associated ARDL error correction model based on different lag selection criterion.

Estimation Results

A. Relationship between Property Price (*LnPPI*), Export Performance (*LnEX*) and Prime Rate (*LnPR*), 1984Q1 – 1997Q4

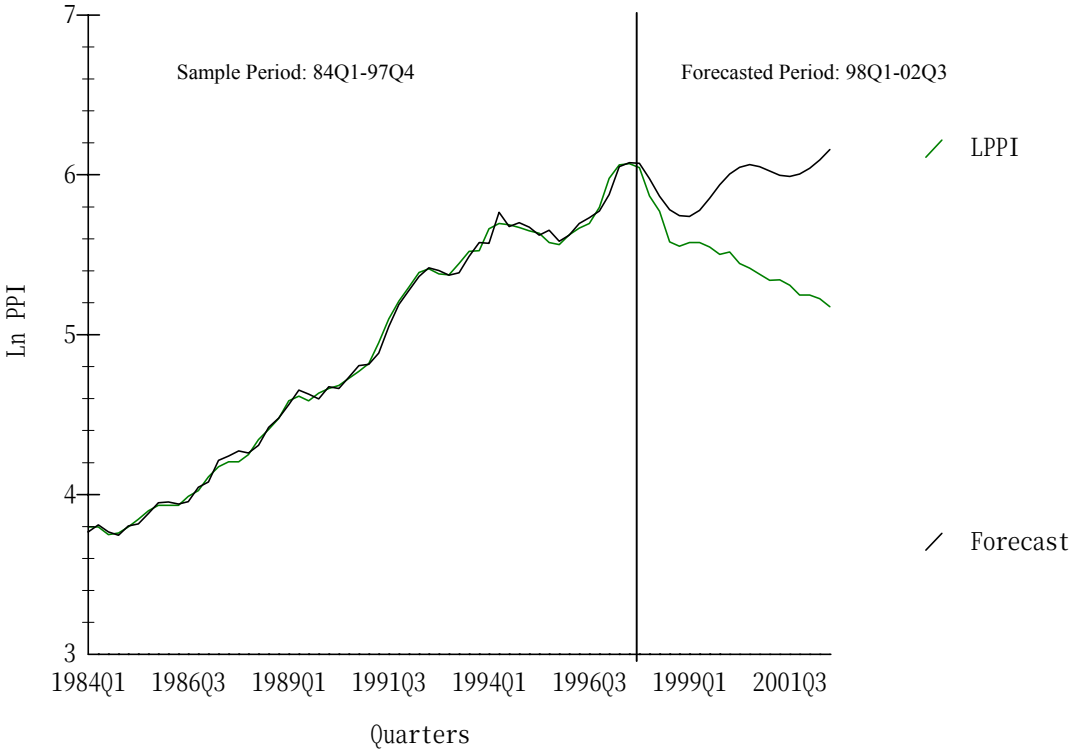
As the estimation results may be sensitive to different lag orders in VAR, to avoid this, we try different lags (starting at 1 and up 6 lags) and see whether or not these could yield consistent results. As can be seen in the Table 1a, the computed F-statistic F(*LnPPI* | *LnEX*,*LnPR*) = 4.93 and 5.26 for lags up to 5 and 6 respectively when the *PPI* is the dependent variable. Since the value exceeds the upper bound of the critical value bound, we can reject the null of no long-run relationship between *LnPPI*, *LnEX* and *LnPR*. Similarly, we then turn *LnEX* and *LnPR* as the dependent variable and then test the joint significance of the lagged level variables in the EC version of the ARDL model. The results in Table 1a show that all the corresponding F-statistic fall below the upper bound critical value (4.85 and 4.14 at 5% and 10% significance level respectively), and therefore the null hypothesis of non-existence of cointegration cannot be rejected. The above results indicate that only F(LnPPI | LnEX,LnPR) is significant and therefore there exists a unique long-run-relationship with the *LnPPI* as the dependent variable and *LnEX* and *LnPR* can be treated as the "long-run" forcing variables for the explanation of *LnPPI*.

In the next stage, we have to determine the lag order of ARDL model. The maximum lag orders set at 6 and the optimal lag structure is determined by the AIC information criteria. The selected model is ARDL (6, 0, 0). The analysis then moves to estimate the coefficients of the long-run relationship and also the associated ARDL error correction model. The estimated coefficients are reported in the Table 1c. The *LnEX* carries a significant expected sign and the *LnPR* is marginally significant at 10% level. The estimate of the error correction model is reported in the

Table 1d. The error term is negative and highly significant which also confirms our earlier findings that cointegration exists between the variables. Note that the size of the error term is 0.13, it indicates that once the property price is experienced an external shock, it takes around 1.5 to 2 years (given the data is quarterly) for the property price to return its equilibrium.

In addition, based on the estimated ARDL model (Table 1c), we plot the actual, fitted and out-of-sample forecasted values of *LnPPI* in Figure 1. We can see that the model fits quite well within the sample period. The forecasted value tells us the fact that the deviation of *LnPPI* from its equilibrium path due to external shock (e.g. the Asian Financial Crisis) should begin to return to its path after 6 quarters from the stock, however, the actual value has continued to move far away from the path it should otherwise be, indicating some others factors have operated and so prevented this from happening.

Figure 1. Dynamic forecasts for the level of LPPI



B. Relationship between Domestic Demand (*LnD*) and Property Price (*LnPPI*), 1984Q1 – 2002Q3

As can be seen in the Table 2a, the null hypothesis can be rejected for the lags below 3 when

LnD is the dependent variable. Since the value exceeds the upper bound of the critical value bound, we can reject the null of no long-run relationship between the *LnD* and *LnPPI*. Similarly, we then turn the *LnPPI* as the dependent variable and then test the joint significance of the lagged level variables in the EC version of the ARDL model. The results in Table 2a show that all corresponding F-statistic fall below the lower bound critical value (4.94 and 4.04 at 5% and 10% significance level respectively), and therefore the null hypothesis of non-existence of cointegration cannot be rejected. The above results indicate that only F(*LnD* | *LnPPI*) is significant and therefore there exists a unique long-run-relationship when the *LnD* as the dependent variable and *LnPPI* can be treated as the "long-run" forcing variables for the explanation of *LnD*.

The estimated long-run coefficients and the error correction representation selected by the AIC information criteria are reported in the Table 2b and 2c respectively (the maximum lag orders set at 3). The *LnPPI* carries the significant expected sign (Table 2b), and the error term in the EC-ARDL model is negative and highly significant (Table 2c) which also confirms our earlier findings that cointegration exists between the variables. The size of the error term is 0.09 which indicates that once the domestic demand is experienced an external shock, it takes around 2.5 to 3 years for the domestic demand to return its equilibrium.

In addition, the above long run relationship is also estimated by Johansen procedure which can not only provide a further test on the relationship between domestic demand and property price but also allow us to identify their causality. The analysis began by examining the stationarity properties of the variables using Augmented Dickey-Fuller (ADF) Test (Dickey and Fuller, 1981). The test results show that the null hypothesis of containing a unit root can only be rejected when the series are in first differences indicating the both series: D and PPI are integrated of order one I(1)[18].

[18] Test results are available here for space consideration.

Since the variables are integrated of the same order I(1), the next step is to carry out co-integration analyses of the variables. I first try to identify the long-run relationship between them, and also their causal relationships by using the Johansen procedure (1988). In order to ensure a correct lag specification for the Johansen test and avoid the possibility of obtaining misleading results, the lag length of the VAR for each case is determined by Akaike's Information Criterion (AIC).

The cointegration test results are presented in Table 2d. The number of co-integrating vectors r is determined by λ_{max} and trace statistics. I start with the null hypothesis of r=0 and moving the value of r up step-by-step until the H_o cannot be rejected. The results show that the LnD is found to be co-integrated with the *LnPPI*.

Table 2e reports the normalized cointegrating coefficients that are interpreted as long run equilibrium coefficients. These coefficients indicate that the *LnPPI* has a positive and significant impact on the *LnD*. It also confirms that the vector error correction model (VECM) is appropriate for examining their long run causal relationships. This is because in the presence of co-integration between two I(1) series, the standard Granger causality test which requires all series are stationary I(0) only picks up the short run interaction and is not appropriate for detecting long run relationships.

The VECM requires to incorporate the error term obtained from the co-integration into the standard Granger causality tests. The corresponding regressions to run are:

$$\Delta LnD_t = \mu + \sum_{i=1}^{k} \alpha_i \Delta LnPPI_{t-i} + \sum_{i=1}^{k} \beta_i \Delta LnD_{t-i} + \delta \tau_{t-1} + \varepsilon_t \quad \text{----------(7)}$$

$$\Delta LnPPI_t = \mu + \sum_{i=1}^{k} \upsilon_i \Delta LnD_{t-i} + \sum_{i=1}^{k} \gamma_i \Delta LnPPI_{t-i} + \phi \eta_{t-1} + \sigma_t \quad \text{----------(8)}$$

where Δ denotes first difference, ε and σ are the error term with the usual properties, τ and η are the error term taken from the bivariate co-integration test between *LnD* and *LnPPI*. In equation (7), the lagged dynamic terms Δ *LnPPI* capture the short run effect of *LnPPI* on *LnD*, while the lagged error correction term τ captures the adjustment toward the long run equilibrium. If δ is statistically significant with a negative sign, *LnD* then is said to be Granger-caused by *LnPPI* in the long run. The same can be said for *LnPPI* if ψ is negative and statistically significant.

The coefficients of the error correction terms (ECM) and their t-statistics are shown in Table 2f. The ECM coefficients enter significantly with negative sign only when the LnD is the dependent variable. The significant negative ECM coefficient, which represents the channel of causality in the long run, also confirms the earlier findings that co-integration exists between them. Based on these results, I can conclude that the direction of causality runs from *LnPPI* to wage *LnD*.

C. Relationship between Government Expenditure (*LnG*) and Property Price (*LnPPI*), 1984Q1 – 2002Q3

As can be seen in the Table 3a, the null hypothesis can be rejected for the lags below 2 when *LnG* is the dependent variable. Since the value exceeds the upper bound of the critical value bound, we can reject the null of no long-run relationship between the *LnG* and *LnPPI*. Similarly, we then turn the *LnPPI* as the dependent variable and then test the joint significance of the lagged level variables in the EC version of the ARDL model. The results in Table 3a show that all corresponding F-statistic fall below the lower bound critical value (4.94 and 4.04 at 5% and 10% significance level respectively), and therefore the null hypothesis of non-existence of cointegration cannot be rejected. The above results indicate that only F(*LnG* | *LnPPI*) is significant and therefore there exists a unique long-run-relationship when the *LnG* as the dependent variable and *LnPPI* can be treated as the "long-run" forcing variables for the

explanation of *LnG*.

The estimated long-run coefficients and the error correction representation selected by the AIC information criteria are reported in the Table 3b and 3c respectively (the maximum lag orders set at 2). The *LnPPI* carries the significant expected sign, and the error term in the EC-ARDL model is negative and highly significant which also confirms our earlier findings that cointegration exists between the variables. The size of the error term is 0.08 which indicates that once the *LnG* is experienced an external shock, it takes around 2.5 to 3 years for the domestic demand to return its equilibrium.

D. Relationship between Real Prime Rate (*RPR*) and Property Price (*LnPPI*), 1997Q1 – 2002Q3

As can be seen in the Table 4a, the null hypothesis can be rejected for the lag =3 when *RPR* is the dependent variable. Since the value exceeds the upper bound of the critical value bound, we can reject the null of no long-run relationship between the *RPR* and *LnPPI*. Similarly, we then turn the *LnPPI* as the dependent variable and then test the joint significance of the lagged level variables in the EC version of the ARDL model. The results in Table 4a show that all corresponding F-statistic fall below the upper bound critical value (4.78 at 10% significance level), and therefore the null hypothesis of non-existence of cointegration cannot be rejected. The above results indicate that only F(*RPR* | *LnPPI*) is significant and therefore there exists a unique long-run-relationship when the *RPR* as the dependent variable and *LnPPI* can be treated as the "long-run" forcing variables for the explanation of *RPR*.

The estimated long-run coefficients and the error correction representation selected by the AIC information criteria are reported in the Table 4b and 4c respectively (the maximum lag orders set at 4). The *LnPPI* carries the significant expected sign, and the error term in the EC-ARDL model is negative and highly significant which also confirms our earlier findings that cointegration exists between the variables.

Table 1a.

F-Statistics for Testing the Existence of a Long-Run Relationship Between Property Price, Total Export and Prime Interest Rate, 1984Q1 to 1997Q4

Dependent Variables:	Lag=1	Lag=2	Lag=3	Lag=4	Lag=5	Lag=6
Δ LnPPI	2.69	2.12	2.25	3.12	4.93**	5.26**
Δ LnEX	2.97	3.18	3.17	1.42	1.26	2.40
Δ LnPR	2.74	2.88	2.47	2.11	2.84	3.08

Note:

1. The critical value bounds for the test are 3.79 – 4.85 at the 95% significance level and 3.17-4.14 at the 90% significance level, which are given in Table C1.iii (with an unrestricted intercept and no trend; number of regressors=2), Shin and Smith (1999).
2. ** denotes 95% significance level and Δ denotes first difference.

Table 1b. Estimated Long-Run Coefficients (Dependent variable: LnPPI)

Regressors	Coefficient (t-ratio)
Intercept	-8.7019 (-9.34)***
LnEX	1.1892 (17.20)***
LnPR	-0.3470 (-1.59)

Note:

1. Optimal Lag: ARDL (6, 0, 0) selected based on AIC Information criteria
2. *** denotes 1% significance level

Table 1c.

Error Correction Representation of ARDL Model

(Dependent variable: Δ LnPPI$_t$)

Regressors	Coefficient (t-ratio)
Intercept	-1.1303 (-3.0217)***
Δ LnPPI$_{t-1}$	0.5791 (4.4319)***
Δ LnPPI$_{t-2}$	-0.1794 (-1.1689)
Δ LnPPI$_{t-3}$	0.2409 (1.6077)
Δ LnPPI$_{t-4}$	-0.1290 (-0.8229)
Δ LnPPI$_{t-5}$	-0.2850 (-2.0438)**
Δ LnEX	0.1550 (3.3373)**
Δ LnPR	-0.0452 (-1.6583)*
ECM$_{t-1}$	-0.1303 (-3.9009)***

Note:

1. Optimal Lag: ARDL (6, 0, 0) selected based on AIC Information criteria
2. *, ** and *** denotes 10%, 5% and 1% significance level respectively

Table 2a. F-Statistics for Testing the Existence of a Long-Run Relationship Between Private Domestic Demand and Property Price, 1984Q1 to 2002Q3

Dependent Variables:	Lag=1	Lag=2	Lag=3	Lag=4	Lag=5	Lag=6
Δ LnD	6.51**	4.83*	6.17**	3.46	3.17	3.17
Δ LnPPI	1.89	1.70	1.47	0.65	0.41	0.32

Note:

1. The critical value bounds for the test are 4.94 – 5.73 at the 95% significance level and 4.04 - 4.78 at the 90% significance level, which are given in Table C1.iii (with an unrestricted intercept and no trend; number of regressor=1), Shin and Smith (1999).
2. * and ** denotes 10% and 95% significance level respectively.

Table 2b. Estimated Long-Run Coefficients (Dependent variable: LnD)

Regressors	Coefficient (t-ratio)
Intercept	8.6597 (22.1448)***
LnPPI	0.6878 (9.9381)***

Note:

1. Optimal Lag: ARDL (2, 0) selected based on AIC Information criteria
2. *** denotes 1% significance level

Table 2c.

Error Correction Representation of ARDL Model (Dependent variable: Δ LnD$_t$)

Regressors	Coefficient (t-ratio)
Intercept	0.7668 (3.7053)***
Δ LnD$_{t-1}$	-0.3619 (-3.6092)***
Δ LnPPI	0.2430 (3.6875)***
ECM$_{t-1}$	-0.0886 (-3.4313)***

Note:

1. Optimal Lag: ARDL (2, 0) selected based on AIC Information criteria
2. *** denotes 1% significance level respectively

Table 2d. Testing Cointegration between LnD and LnPPI using the Johansen Procedure, 1984Q1 to 2002Q3

Explanatory Variables	**Null Hypothesis**	**Alternative Hypothesis**	**Test Statistics**
LnD = *f* (LnPPI)	Trace tests:		Trace Value
	r = 0	r > 0	25.91**
	r≦1	r > 1	2.83
	λ max tests:		λ max Value
	r = 0	r = 1	23.08***
	r = 1	r = 2	2.83

Notes: 1) ***, ** and * denotes significance at 1%, 5% and 10% level respectively.
2) r indicates the number of cointegrating vectors.
3) optimal lags are determined by AIC criterion

Table 2e. Normalized Cointegrating Coefficients (Bivariate Estimates) Using the Johansen Procedure

Cointegrating equation:	**Coefficient**	**t-statistic**
LnD = *f* (LnPPI)		
Intercept	9.0161	22.1893***
LnPPI	0.6230	8.1619***

Notes:
1) *** denotes significance at 1%
2) optimal lags are determined by AIC criterion

Table 2f. Causality Tests Using the VECM Approach

Dependent Variable	**Null Hypothesis**	**Coefficient for ECM(-1)**	**t-statistics for ECM(-1)**
DLDPD	LnPPI *does not cause* LnD	-0.0763	-5.0019***
DLPPI	LnD *does not cause* LnPPI	-0.0220	-1.1017

Notes:
1) *** denotes significance at 1%.
2) D denotes first difference
3) optimal lags are determined by AIC criterion

Table 3a. F-Statistics for Testing the Existence of a Long-Run Relationship Between Government Expenditures and Property Price, 1984Q1 to 2002Q3

Dependent Variables:	Lag=1	Lag=2	Lag=3	Lag=4	Lag=5	Lag=6
Δ LnG	7.41**	5.21*	2.82	1.37	0.90	0.85
Δ LnPPI	1.95	1.99	2.09	2.10	2.15	2.77

Note:

1. The critical value bounds for the test are 4.94 – 5.73 at the 95% significance level and 4.04 - 4.78 at the 90% significance level, which are given in Table C1.iii (with an unrestricted intercept and no trend; number of regressor=1), Shin and Smith (1999).
2. * and ** denotes 10% and 95% significance level respectively.

Table 3b. Estimated Long-Run Coefficients (Dependent Variable: LnG)

Regressors	Coefficient (t-ratio)
Intercept	5.7429 (14.590)***
LnPPI	0.9108 (12.1273)***

Note:

1. *** denotes 1% significance level
2. Optimal Lag: ARDL (2, 0) selected based on AIC Information criteria

Table 3c.

Error Correction Representation of ARDL Model (Dependent variable: ΔLnG_t)

Regressors	Coefficient (t-ratio)
Intercept	0.4803 (4.7506)***
ΔLnG_{t-1}	-0.3449 (-3.2888)***
Δ LnPPI	0.0762 (4.2381)***
ECM_{t-1}	-0.0836 (-4.6156)***

Note:

1 Optimal Lag: ARDL (2, 0) selected based on AIC Information criteria

2 *** denotes 1% significance level respectively

Table 4a. F-Statistics for Testing the Existence of a Long-Run Relationship Between Real Prime Rate and Property Price, 1997Q1 to 2002Q3

Dependent Variables:	Lag=1	Lag=2	Lag=3	Lag=4	Lag=5	Lag=6
ΔRPR	1.83	2.20	5.19*	3.03	1.82	3.54
ΔLnPPI	0.47	1.90	0.18	2.20	3.22	4.23

Note:

1. The critical value bounds for the test are 4.94 – 5.73 at the 95% significance level and 4.04 - 4.78 at the 90% significance level, which are given in Table C1.iii (with an unrestricted intercept and no trend; number of regressor=1), Shin and Smith (1999).
2. * denotes 10% significance level.

Table 4b. Estimated Long-Run Coefficients (Dependent Variable: RPR)

Regressors	Coefficient (t-ratio)
Intercept	53.82 (3.66)***
LnPPI	-8.18 (-3.07)***

Note:

1. *** denotes 1% significance level
2. Optimal Lag: ARDL (4, 0) selected based on AIC Information criteria

Table 4c.

Error Correction Representation of ARDL Model (Dependent variable: ΔRPR)

Regressors	Coefficient (t-ratio)
Intercept	16.0188 (2.1711)**
ΔRPR(-1)	0.1236(0.7416)
ΔRPR(-2)	0.2460(1.4104)
ΔRPR(-3)	0.6705(3.8501)***
ΔLnPPI	-2.4347(-1.988)**
ECM_{t-1}	-0.2977(-3.2169)***

Note:

3 Optimal Lag: ARDL (4, 0) selected based on AIC Information criteria

4 ** and *** denotes 5% and 1% significance level respectively

Variable Definition

Variables	Description	Data Sources
LnPPI	Log property price index (overall private domestic housing market) 1989=100	Hong Kong Monthly Digest of Statistics, Hong Kong Census and Statistics Dept
LnG	Log of government consumption expenditure (current price)	Hong Kong GDP estimates 2001, Hong Kong Census and Statistics Dept
LnD	Log of domestic private demand = Log of (Private Consumption + Private construction + Machinery & Equipment) (current price)	Hong Kong GDP estimates 2001, Hong Kong Census and Statistics Dept
LnPR	Log Prime Rate	Monthly Statistical Bulletin, various issues, Hong Kong Monetary Authority
RPR	Prime Rate – Inflation Rate (CPI A, year on year change)	Monthly Statistical Bulletin, various issues, Hong Kong Monetary Authority, and; Hong Kong Monthly Digest of Statistics, Hong Kong Census and Statistics Dept
LnEX	Log total exports of goods and services	Hong Kong GDP estimates 2001, Hong Kong Census and Statistics Dept