The Direct Substitution between Government and Private Consumption in East Asia

Yum K. Kwan
City University of Hong Kong

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Abstract

We investigate empirically the extent of direct substitution between government and private consumption in nine East Asia countries. Panel cointegrating regression uncovers a significantly positive elasticity of substitution between government and private consumption, implying that on average government and private consumption are substitutes in East Asia. Country-by-country analysis, however, reveals diversity in the substitutability estimates. The four North East countries -- China, Hong Kong, Japan, and Korea – tend to share similar and small values of the substitution elasticity. For the five ASEAN countries studied in this paper, the relationship between private and government consumption vary substantially, both in the sign and magnitude of the elasticity of substitution. Private and government consumption in Malaysia and Thailand are strong substitutes, but they are found to be complements in Indonesia and Singapore. In between is the Philippines which has a near zero elasticity of substitution.

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1. Introduction

An important issue in the design of fiscal policy is the substitutability between government and private consumption. If the private sector derives utility from government–provided goods and services and regard private and government consumption as close substitutes, an increase in government consumption will be offset by a corresponding decrease in private consumption, rendering the size of the fiscal multiplier relatively small and even potentially negative. On the other hand, if private and government consumption are complements, an expansionary fiscal policy will be relatively effective in stimulating aggregate demand as private consumption will reinforce the initial fiscal impulse. While it is easy to give examples of *individual* private and government goods that are substitutes or complements, it is an empirical question whether *aggregate* private and government consumption are substitutes or complements for a particular economy during certain period. The purpose of this paper is to empirically study the substitutability issue for nine East Asian countries – China, Hong Kong, Japan, Korea, Indonesia, Malaysia, Philippines, Singapore, and Thailand.

Traditional macroeconomic models assume that government consumption works through its impact on private consumption through wealth effect or interest rate effect. Private consumption is crowded out either the consumers feel poorer because of negative wealth effect or being induced to substitute intertemporally by the higher interest rate caused by deficit–financed government spending. Bailey (1971) and Barro (1981) first suggest incorporating government consumption into the representative agent decision problem, making the public sector part of the general equilibrium system. The idea is that many government goods are to some extent substitutes for private consumption goods. Moreover, government purchases may also serve as useful inputs to the private production function so that government consumption can be productive. This is in contrast to the traditional models in which government consumption are regarded as purely wasteful or unrelated to private consumption or production. In recent theoretical literature, the interaction between government and private consumption has been assigned a central role in the study of fiscal policy, in both the neoclassical real business cycle fashion and the new Keynesian fashion with nominal rigidities. See, for example,

Aiyagari et al. (1992), Baxter and King (1993), Devereux et al. (1996), and Ganelli (2003).

On the empirical front, a large literature has been developed to estimate the relationship between government and private consumption. Kormendi (1983) and Aschauer (1985) are representative of the earlier approach that relies on estimating a consumption function. Karras (1994), Ni (1995), Evans and Karras (1996), and Fiorito and Kollintzas (2004) are some of the more recent contributions along this approach. Ni's paper also provides a useful survey of the literature. The empirical analysis in this paper follows Amano and Wirjanto (1997, 1998) who make use of the cointegration approach of Ogaki (1992) and Ogaki and Park (1997) to estimate the preference parameter that governs the relationship between government and private consumption. The idea is to exploit the long–run restriction imposed by the intraperiod first–order condition that characterizes the optimal choice of private and government consumption. Ho (2001), Chiu (2001), and Okubo (2003) are some recent contributions along the same line.

The rest of the paper is organized as follows. Section 2 presents the empirical model in detail. We provide a structural interpretation to the cointegrating regression model by deriving it as an equilibrium condition. Section 3 provides a brief description of government expenditures in East Asia. The data and empirical results are presented in section 4. Section 5 concludes.

2. The empirical model

The empirical work in this paper centers around a cointegrating regression that relates the logarithm of private and government consumption ratio, C_t / G_t, to the logarithm of their relative price P_t^g / P_t^c:

$$\ln(C_t / G_t) = \alpha + \beta \ln(P_t^g / P_t^c) + u_t \tag{1}$$

where $\ln(C_t / G_t)$ and $\ln(P_t^g / P_t^c)$ are both difference–stationary I(1) processes, and u_t is a stationary I(0) process. Formal statistical evidence for the cointegration property will be provided below. The slope parameter β is the elasticity of substitution between private and government consumption. A positive (negative) β means that the two goods are substitutes (complements). One attractive feature of cointegrating regression is that the slope parameters can be estimated consistently without the assumption that the regressors are econometrically exogenous. In eq. (1), for example, β can still be estimated consistently even though there may be stationary omitted variables or measurement errors.

So far eq. (1) is treated as a pure statistical relationship between the consumption ratio of private and government goods and their relative prices. It is possible to provide the equation a structural interpretation by deriving it as an equilibrium condition, following the ideas of Ogaki (1992) and Ogaki and Park (1997). Assume that the representative consumer values two goods, private goods and government goods, according to an expected life–time utility function subject to stationary preference shocks:

$$U = E_t[\sum_{j=0}^{\infty} \delta^j u(C_{t+j}^*)] \tag{2}$$

where

$$C_t^* = [\phi \varepsilon_t C_t^{1-(1/\sigma)} + (1-\phi)\nu_t G_t^{1-(1/\sigma)}]^{1/[1-(1/\sigma)]} \tag{3}$$

(ε_t, ν_t) are random preference shocks which are assumed to be strictly stationary, have unit mean and finite variances. The stationarity assumption amounts to say preferences are stable in the long run. The period utility function is assumed to possess the usual properties $u' > 0$ and $u'' < 0$. (ϕ, σ) are preference parameters which characterize the representative agent's utility function: ϕ is the relative weight assigned to private goods and σ is the substitution parameter which measures the curvature of the indifference curves. Given time–separability of the utility function, the optimal consumption bundle will have to satisfy the equality between marginal rate of substitution and relative prices

(4) $$\frac{\partial U / \partial G_t}{\partial U / \partial C_t} \equiv \frac{\nu_t (1-\phi) G_t^{-1/\sigma}}{\varepsilon_t \phi C_t^{-1/\sigma}} = \frac{P_t^g}{P_t^c}$$

Taking logarithm and rearranging yield

(5) $$\ln(C_t / G_t) = -\sigma \ln[(1-\phi)/\phi] + \sigma \ln(P_t^g / P_t^c) - \sigma \ln(\nu_t / \varepsilon_t)$$

Stable preferences implies that the residual term $-\sigma \ln(\nu_t / \varepsilon_t)$ is stationary and hence eq. (5) should be a cointegrating regression, provided that log consumption ratio, $\ln(C_t / G_t)$, and log price ratio, $\ln(P_t^g / P_t^c)$, are both I(1) processes. In other words, the stable preferences assumption, together with the consumer optimality condition in eq. (4), imposes a cointegration restriction on the movements of the log consumption ratio and the log price ratio series. Eq. (5) provides a structural interpretation to eq. (1) which can be regarded as the reduced form equation with parameters and residuals related to their structural counterpart via the relationships

(6) $$\begin{aligned} \alpha &= -\sigma \ln[(1-\phi)/\phi] \\ \beta &= \sigma \\ u_t &= -\sigma \ln(\nu_t / \varepsilon_t) \end{aligned}$$

Notice that eq. (5) is a theoretical demand equation, whereas eq. (1) is an empirical equation describing the equilibrium quantities and prices. Just like the classical supply–and–demand simultaneous equation model, interpreting eq. (1) as the demand equation requires identification assumption. In general, to identify the demand equation, we need variability from the supply side and the demand side should be relatively stable. As discussed in Ogaki (1992), the stable preferences assumption and a stochastic trend in the quantity supplied (or the equilibrium quantity) are sufficient to ensure identification.

In the theoretical analyses of Bailey (1971) and Barro (1981), followed by the empirical work of Kormandi (1983), Aschauer (1985), Evans and Karras (1996), among

many others, the effective consumption is specified as a weighted average of private and government consumption:

$$C_t^* = C_t + \theta G_t \tag{7}$$

In this setup each unit of government goods is equivalent to θ units of private goods, irrespective of the current consumption level of the two goods. In other words, the indifference curves for the two goods are linear which corresponds to the extreme case of $\sigma = +\infty$ in the CES aggregator function in eq. (3). Clearly this is an empirically restrictive assumption, albeit a convenient one for analytical tractability.

3. Government expenditures in East Asia

Table 1 reports a summary of the government expenditures (in percentage of GDP) for the nine Asian countries studied in this paper, together with the corresponding figures for the United States for comparison. The reported numbers are computed by averaging annual figures over 1995–2001. Total government outlays comprise of government consumption of goods and services, public capital investment, transfer payments, and interest payments of outstanding government debts. In terms of either total outlays or government consumption, Japan stands out as having the largest government among the nine Asian countries, comparable in size to that of the United States. After excluding national defense spending from government consumption, we see that the Japanese government actually purchases a lot more goods and services than the US government (15% versus 11.5% of GDP). The remaining eight Asian governments are of similar size in terms of total outlays, commanding around 20% of GDP, with the Hong Kong government being the smallest (18.4%) and the Malaysian government being the largest (23.2%). Again, defense spending can make a big difference in our impression of the extent to which the public sector allocates resource in the economy. A case in point is Hong Kong which has no defense spending. In terms of non–defense government consumption, the Hong Kong government purchases as much as 9.1% of GDP, a figure

considerably higher than Korea and the ASEAN countries except for the Philippines. The other extreme is Singapore which spends the highest fraction of GDP on national defense among the Asian countries. After excluding defense spending, the Singapore government consumption drops to only 5.5% of GDP, the lowest among all countries in this study. Another noteworthy case is the Philippines which has a low defense spending but high government consumption. The non–defense government consumption of the Philippines is 11.3% of GDP, a figure almost the same as that of the United States (11.5% of GDP) and being the highest among the Asian countries except Japan.

Table 1 also reveals that the nine Asian governments devote considerably amount of resources on capital investment, notably public infrastructure and national enterprises. This is in sharp contrast to the United States in which public investment is only 0.9% of GDP. Among the heavy public investors, the Thai government stands out as the largest investor by devoting 7.5% of GDP to public investment, followed by Indonesia (5.9%), Singapore (5.6%), and Malaysia (4.5%). In terms of transfer payments, the figures of the Asian countries are all relatively low comparing with the United States. Japan and Korea have the highest percentage of government transfers of 8.3% and Thailand has the lowest transfers of only 1.7% of GDP. In terms of interest payments, the Philippines has the highest figure of 3.8% of GDP, followed by Japan (3%), Malaysia (2.7%) and Indonesia (2.3%).

4. Empirical results

We use annual data for 1960–2002 from the *World Development Indicators* (World Bank, 2004) whenever possible to ensure cross–country compatibility. Missing or erroneous entries are reconstructed from local sources. Private and government consumption are taken to be the relevant expenditure series from the National Income and Product Accounts (NIPA). The consumption ratio, C_t / G_t, is calculated from the constant price private and government consumption series. The two price series, P_t^g and P_t^c, are simply the respective implicit price deflators constructed by dividing the nominal series by the constant price counterpart.

We begin by examining the time series properties of the log consumption ratio series, $\ln(C_t / G_t)$, and the log price ratio series, $\ln(P_t^g / P_t^c)$. Figure 1 depicts the two series for all nine Asian countries. The strong persistency and co-movements of the two series are clearly discernable from the plots, giving an initial impression that they may be I(1) and cointegrated. Table 2 reports panel unit root test results. It is well known that unit root tests have low power and the problem may be even worse for our application as we have short time series. To better utilize sample information, we pool the nine countries' data to perform panel unit root tests, which have been shown to be more powerful than the individual time series version. All three panel unit root tests draw the same conclusion: the unit root null hypothesis is not rejected for the level series but is strongly rejected for the first–differenced series. This shows that the log consumption ratio and the log price ratio series are indeed I(1). Moreover, the asymmetry of the p–values for the level series in the IPS test and the ADF-Fisher chi-square test suggest that log consumption ratio is the less integrated series – in the sense that it has a weaker random walk component – than the log price ratio. This has important implications to the specification of the cointegrating regression. It is well known that cointegrating regression is not invariant to normalization choice — deciding which variable to put on the left hand side as the regressand – and different choices may imply different estimates for the same parameter. For example, instead of running regression eq. (1), we could have run the reverse regression with the log price ratio normalized as the regressand to obtain an estimate of $(1/\beta)$. In finite sample the estimates from the direct and reverse regression may be far from being reciprocal to each other and they may also have drastically different statistical properties. According to Ng and Perron (1997), in the context of cointegrating regression, it is preferable to put the less integrated series as the regressand and the more integrated series as the regressor. Applying the Ng–Perron rule, this means that designating the log consumption ratio series as the regressand as in eq. (1) is indeed the right choice.

Table 3 reports panel estimation results for eq. (1) with country specific fixed effects. The cointegration property of eq. (1) is confirmed by the two panel cointegration tests: the null hypothesis of no cointegration is decisively rejected by Kao's (1999) ADF test but the null of cointegration cannot be rejected according to the McCoskey and Kao

(1998) LM test. Turning to the elasticity of substitution between private and government consumption — the coefficient of $\ln(P_t^g / P_t^c)$ — it can be seen that the estimates are all significantly positive, ranging between 0.57 and 1.05 with small standard errors, and varying across different estimation methods and sample periods. The empirical results suggest that on average private and government consumption in East Asia are substitutes with an elasticity of substitution midway between 0.5 and 1.

We also estimate an unrestricted version of eq. (1) as a simple specification check:

$$\ln(C_t / G_t) = \alpha + \beta_1 \ln(P_t^g) + \beta_2 \ln(P_t^c) + u_t \tag{8}$$

Eq. (1) is a restricted version of eq. (8) with $\beta_1 + \beta_2 = 0$. Estimates of β_1 and β_2 that are similar in magnitude but opposite in sign provide evidence in favor of the restriction and hence eq. (1). As can be seen from Table 3, the pattern of the parameter estimates is in general supportive of eq. (1); and the evidence is especially strong when all nine Asian countries are included in the sample for the period 1978–2002 (Panel B). According to the fully efficient DOLS estimates, government and private consumption in East Asia during 1978-2002 have a substantial degree of substitutability with an elasticity of substitution around 1, implying a Cobb-Douglas aggregator function for eq. (3).

From a policy perspective, the panel estimate may not be of much practical relevance, as it tells us little about any individual country. Table 4 therefore reports cointegrating regression results for the nine Asian countries individually. We also report the corresponding results for the United States for comparison. To check robustness, we try three different estimation methods which are all asymptotically efficient procedures for estimating cointegration regressions. The three methods are Phillips and Hansen (1990) fully modified ordinary least square (FM-OLS), Park (1992) canonical cointegrating regression (CCR), and Stock and Watson (1993) dynamic ordinary least squares (DOLS). In general the parameter estimates are stable across the three estimation methods. Comparing the DOLS estimates of the elasticity of substitution across countries, Malaysia and Thailand come up with the highest values of 1.66 and 1.51, respectively, which are comparable to the value of 1.5 of the United States. On the other extreme are

Indonesia and Singapore for which the negative elasticities of substitution of -0.92 and -1.76, respectively, imply that private and government consumption are strong complements. The four North East Asian countries, China, Hong Kong, Japan, and Korea, share a moderate elasticity of substitution ranging from 0.41 in Hong Kong to 0.65 in China. The Philippines, on the other hand, has a numerically small and statistically insignificant elasticity of substitution of 0.07, indicating little substitution in private and government consumption.

Indonesia and Thailand provide an interesting case of contrast. The estimated elasticity of substitution between private and government consumption is -0.92 for Indonesia and 1.51 for Thailand. Government consumption is a strong substitute to private consumption in Thailand, implying that a fiscal contraction that makes government goods relatively more expensive will induce substantial expansion in private consumption, thereby offsetting or even outweighing the negative impact of the fiscal contraction on aggregate demand. The Indonesian government consumption, in contrast, is a strong complement to private consumption, implying that a fiscal contraction that makes government goods relatively more expensive will generate a large negative income effect that outweighs the substitution effect, leading to a concomitant contraction in private consumption expenditure that further depresses aggregate demand. This perhaps helps explain why the real sectors of the two countries respond so differently to the same fiscal austerity measure prescribed by the IMF during the 1997 Asian financial crisis.

What explains the cross-country diversity in the substitution between private and government consumption? In their international study, Evans and Karras (1996) find a statistically significant negative relationship between the share of government expenditure that goes to national defense and the degree of substitutability between private and government consumption. The idea is that the higher is the defense share, the higher is the public goods component in government consumption which reduces its ability to substitute for private consumption. In Table 5 we collect together for the nine East Asia countries their government size, defense and education shares in government spending, and estimates of the elasticity of substitution between private and government consumption. The entries are sorted by the substitution elasticities for ease of comparison. It is clear that government size does not explain substitutability. It is also hard to find a

negative relationship between defense expenditure share and substitutability. There appears to be a positive relationship between education expenditure share and substitutability, if Singapore is treated as an outlier. This implies that in these Asian countries the public education system has been providing services that could have been provided by the private sector.

5. Conclusion

In this paper we have estimated the degree of substitution between private and government consumption in nine East Asia countries. On average there is substantial substitutability between private and government consumption, implying there will be direct crowding out of private consumption by government consumption. Such direct crowding out effect will reinforce the conventional interest rate and wealth effect crowding out channels to make fiscal policy relatively ineffective in East Asia. We also find that the substitutability between private and consumption varies among the Asian countries. Government and private consumption turn out to be complements in Indonesia and Singapore, but they are substitutes in other Asian countries with different degrees of substitutability. There is no obvious quantitative variable that can explain the cross-country diversity in substitutability, although the share of government expenditure that goes to education seems to be positively correlated with substitutability. Future study on this issue will need a more careful examination of each country's institutional details – one will have to understand what sort of government services those public consumption figures represent – before further conclusion can be drawn.

Table 1: Government expenditures 1995–2001 (% of GDP)

	Goods and services [a]	Capital expenditure	Transfer payments	Interest payments	Total outlays
NE Asia					
China	12.3 (10.1)	–	–	–	–
Hong Kong	9.1 (9.1)	3.9	5.4	0.0	18.4
Japan	15.9 (15.0)	1.9	8.3	3.0	29.1
Korea	10.2 (7.0)	3.7	8.3	0.5	22.7
SE Asia					
Indonesia	7.1 (5.6)	5.9	5.0	2.3	20.3
Malaysia	11.1 (7.7)	4.5	4.8	2.7	23.2
Philippines	12.6 (11.3)	2.0	3.3	3.8	21.7
Singapore	10.2 (5.5)	5.6	2.7	0.7	19.2
Thailand	10.8 (8.7)	7.5	1.7	0.6	20.7
USA	14.8 (11.5)	0.9	12.2	2.8	30.7

Notes:
[a] Figures in parentheses are government consumption excluding national defense spending.

Table 2: Panel unit root tests

	$\ln(C/G)$	$\Delta\ln(C/G)$	$\ln(P_g/P_c)$	$\Delta\ln(P_g/P_c)$
IPS W–statistic	0.6551 [0.2562]	15.2985 [0.0000]	0.6002 [0.7258]	14.0852 [0.0000]
ADF – Fisher Chi–square	20.3887 [0.3114]	196.183 [0.0000]	15.7766 [0.6081]	178.734 [0.0000]
PP – Fisher Chi–square	18.0178 [0.4545]	262.871 [0.0000]	18.6922 [0.4110]	270.737 [0.0000]

Notes:

[a] P–values in parentheses

[b] H_0: Each country follows an Individual unit root process.
H_1: At least one country's process is trend stationary

[c] Exogenous variables: individual effects, individual linear trends

[d] Cross–sectional units: China, Hong Kong, Indonesia, Japan, Korea, Malaysia, Philippines, Singapore, Thailand

[e] Time period: China 1978–2002; other countries 1960–2002.

[f] IPS = Im, Pesaran and Shin (2003). ADF-Fisher and PP–Fisher are Maddala and Wu (1999) Fisher–type tests constructed by combining the p–values from individual augmented Dickey–Fuller (ADF) and Phillips–Perron (PP) unit–root tests.

Table 3: Panel cointegrating regressions

Regressand: $\ln(C_t / G_t)$

Panel A: 8 Asian countries (exclude China) 1960–2002

	Regressors			Cointegration Test	
	$\ln(P_t^g / P_t^c)$	$\ln(P_t^g)$	$\ln(P_t^c)$	ADF	LM
OLS	0.5722			–5.5516	0.6516
	(0.0614)			[0.0000]	[0.2573]
OLS		0.7975	–0.8847	–4.3753	2.4090
		(0.0639)	(0.0698)	[0.0000]	[0.0080]
DOLS	0.7555				
	(0.0651)				
DOLS		1.0132	–1.1132		
		(0.0607)	(0.0646)		

Panel B: 9 Asian countries (include China) 1978–2002

	Regressors			Cointegration Test	
	$\ln(P_t^g / P_t^c)$	$\ln(P_t^g)$	$\ln(P_t^c)$	ADF	LM
OLS	0.6373			–6.8337	0.5369
	(0.1064)			[0.0000]	[0.2957]
OLS		0.5958	–0.5718	–6.7290	0.4498
		(0.1361)	(0.1709)	[0.0000]	[0.3264]
DOLS	1.0589				
	(0.0999)				
DOLS		0.9740	–0.9073		
		(0.1250)	(0.1591)		

Notes:
[a] Standard errors in parentheses
[b] P–values in square brackets
[c] All regressions include country–specific fixed effect (unreported)
[d] DOLS = Kao and Chiang (2000) panel dynamic OLS. The regression is augmented with one lead and one lag of the first difference of the regressors (unreported).
[e] ADF = Kao (1999) panel ADF test for the null hypothesis of no cointegration. The lag length in the test regression is chosen by the Schwarz criterion.
[f] LM = McCoskey and Kao (1998) panel LM test for the null hypothesis of cointegration

Table 4: Individual cointegrating regressions

	FM–OLS		CCR		DOLS	
NE Asia	intercept	$\ln(P_t^g / P_t^c)$	intercept	$\ln(P_t^g / P_t^c)$	intercept	$\ln(P_t^g / P_t^c)$
China	1.3334	0.6699	1.3335	0.6691	1.3526	0.6524
	(0.0161)	(0.1452)	(0.0161)	(0.1513)	(0.0216)	(0.2136)
Hong Kong	1.8645	0.3242	1.8656	0.3269	1.8772	0.3424
	(0.0245)	(0.0556)	(0.0259)	(0.0575)	(0.0260)	(0.0468)
Japan	1.3063	0.2962	1.3064	0.2986	1.3329	0.4149
	(0.0204)	(0.1026)	(0.0192)	(0.0758)	(0.0119)	(0.0780)
Korea	1.6748	0.5770	1.6755	0.5778	1.6468	0.5233
	(0.0297)	(0.0594)	(0.0300)	(0.0591)	(0.0177)	(0.0331)
SE Asia						
Indonesia	1.8534	–0.9809	1.8574	–0.9273	1.8613	–0.9243
	(0.1038)	(0.5449)	(0.1030)	(0.5090)	(0.0449)	(0.2614)
Malaysia	1.3427	1.6028	1.3421	1.6218	1.3420	1.6601
	(0.0255)	(0.3979)	(0.0257)	(0.4106)	(0.0193)	(0.3488)
Philippines	2.2307	0.0458	2.2334	0.0328	2.2179	0.0707
	(0.0423)	(0.1288)	(0.0421)	(0.1333)	(0.0361)	(0.1207)
Singapore	1.4852	–1.9452	1.4836	–1.9716	1.4933	–1.7679
	(0.0556)	(0.4855)	(0.0563)	(0.5069)	(0.0371)	(0.3586)
Thailand	1.7239	1.3858	1.7241	1.3841	1.7057	1.5149
	(0.0684)	(0.5139)	(0.0646)	(0.4778)	(0.0440)	(0.3447)
USA	1.4284	1.5373	1.4298	1.5155	1.3818	1.5078
	(0.0291)	(0.2304)	(0.0292)	(0.1677)	(0.0184)	(0.1642)

Notes:
[a] Standard errors in parentheses
[b] Time period: China 1978–2002; other countries 1960–2002.
[c] FM–OLS = Fully modified OLS; CCR = Canonical cointegrating regression; DOLS = Dynamic OLS. FM–OLS and CCR use Andrews' automatic bandwidth selection method in computing the long run variance matrix. DOLS includes one lead and one lag of the first difference of the regressors in the augmented regression.

Table 5: Government expenditure and substitutability

	Expenditure (% of GDP)	Defense (% of expenditure)	Education (% of expenditure)	Elasticity of Substitution (DOLS estimate)
Singapore	19.2	24.5	17.1	–1.76
Indonesia	20.3	8.7	6.9	–0.92
Philippines	21.7	6.9	16.6	0.07
Hong Kong	18.4	0.0	19.3	0.34
Japan	29.1	5.0	20.6	0.41
Korea	22.7	20.9	22.5	0.52
China	–	24.6	26.9	0.65
Thailand	20.7	12.8	24.3	1.51
Malaysia	23.2	10.7	19.8	1.66

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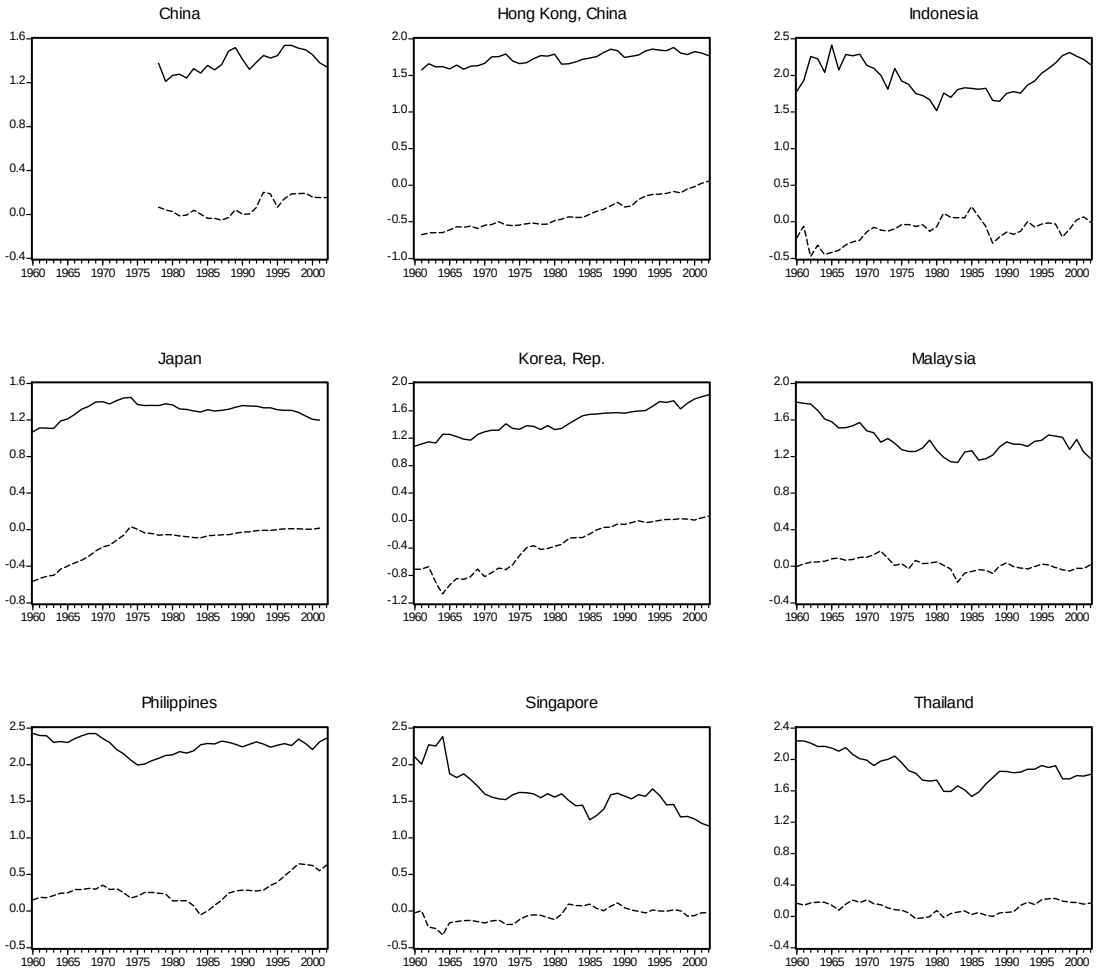
Figure 1



Solid = log consumption ratio $\ln(C_t / G_t)$

Dashed = log price ratio $\ln(P_t^g / P_t^c)$