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Government Control and Economic Growth in Asia: Evidence from Time Series Data

ZAIDI SATTAR

Government control of the economy varies widely, in degree as well as effectiveness, across countries and continents. The LDCs of Asia have generally opted for planned development and a large public sector, giving their governments significant control over their economies. The Newly Industrialising Countries (NICs) of Asia, on the other hand, have thrived on economic liberalisation and greater market orientation. The growth record of the Asian LDCs during the past decade appears pitiful as compared to that of the high-growth NICs. The present study attempts to empirically reassess the nature of the government's linkage with growth and productivity in Asian LDCs. The study finds evidence of a significant linkage between government and growth in developing Asia, but not in the NICs or eight of the leading market economies of the world. Empirical evidence from the present study suggests that excessive government control in the Asian LDCs might have bred inefficiency, though not so much as to retard economic growth. On balance, governmental impact on these economies remains significantly positive.

I. INTRODUCTION

Governments in Asia exercise considerable influence on their respective economies. Enormous expenditures are incurred to fulfil what are considered to be essential public responsibilities: (a) provision of economic and social infrastructure; (b) regulating private activities believed to be harmful to society; (c) intervening where market failures or distortions exist. Some of these activities improve economic efficiency while others reduce it. The ultimate outcome might be positive or negative with regard to economic performance and is a matter for empirical examination. Consequently, this study is undertaken to derive, empirically, some tentative inferences about the productivity effects over time of government control in Asia and its Newly Industrialising Countries. A brief comparison is then drawn with the economic performance of G-7 leading industrial market economies.

II. GOVERNMENT CONTROL AND ECONOMIC GROWTH

Government control is difficult to quantify and we recognise that several dimensions of the government intervention defy quantitative assessment. It is often

Zaidi Sattar is Associate Professor, Department of Economics, Shippensburg University of Pennsylvania, Shippensburg, Pennsylvania, USA.

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represented by a cornucopia of protectionist policies, quantitative restrictions, incentive systems, taxes and subsidies, licencing procedures and burdensome regulations. To administer these policies, Asian governments must sustain enormous recurrent public expenditures on goods and services. Although total real government expenditures may only be the tip of the iceberg, it is possible but not necessary that these expenditures vary in proportion to the degree of control exercised by governments on the economy, since greater control is likely to entail higher administrative outlays.

Theoretical positions on the influence of government on economic performance have been as diverse as the number of their leading proponents. The present mainstream viewpoint that seems to dominate policy-making in Asian economies favours economic liberalisation by eliminating most facets of state interference with market forces–thus effectively reducing government control of the economic process. The practical implementation of this view in Asia faces stiff resistance from various lobbies see Sattar (1989).

The extent of market orientation of the economy varies inversely with the degree of government control exercised. Compared to the LDCs of Asia, governments in the industrial market economies exert indirect control mostly through fiscal and monetary instruments, while permitting the maximum leverage to market forces. While it is widely accepted that government intervention played a key role in the rapid growth of the NICs [Kuznets (1988); Balassa (1988); Krueger (1985) and many others], it is also recognised that the intervention was indirect but effective, promoting rather than hurting entrepreneurship and business incentives. The remarkable success of the NICs, despite highly interventionist governments, proves yet another point: that the good intervention is better than the bad. For all the intervention in the NICs, the emphasis was heavily on outward-looking policies and the price system was essentially left intact as a signalling device for the private sector. It is possible to discern from their experience that a close correspondence exists between the outward orientation and the market orientation of economies. The rest of developing Asia suffered from a lack of both these attributes while tolerating a significant degree of government control over their economies. Unfortunately, the degree of government control or market orientation is impossible to quantify. For empirical analysis, most researchers have, therefore, adopted the public expenditure approach to assessing the impact of government on economic performance.

Two important clarifications are in order. First, the share of government expenditure in the GDP may be indicative of government size but may not reflect the degree of government control exercised. Asian LDCs with smaller expenditure shares (see Table 1) are known to exercise far greater economic control as compared to the industrial market economies. Second, a strong control need not imply effective intervention. Intervention, if inefficient, could contribute to produc-

Table 1

Growth Rates and Government Expenditure Shares (%), 1975–85

Country	Average Annual Growth Rate[a]	Average Government Expenditure Share[b]
Bangladesh	4.38	9.0
Burma	5.80	18.7
India	4.26	9.3
Iran	0.00	18.6
Iraq	–2.59	24.0
Israel	2.65	36.5
Jordan	7.32	28.5
Malaysia	7.22	16.0
Pakistan	6.42	10.7
Philippines	3.54	8.3
Sri Lanka	6.06	9.4
Syria	5.10	17.4
Thailand	5.78	12.4
Asia Average[c]	5.32	16.0
Hong Kong	9.45	6.9
S. Korea	9.80	11.0
Singapore	10.14	10.4
Taiwan	8.29	15.8
NIC Average	9.42	11.0
Japan	4.52	10.0
Canada	2.50	13.1
France	2.00	12.6
W. Germany	2.33	16.4
Italy	2.78	15.2
UK	1.71	23.1
USA	2.53	14.7
G-7 Average (excluding Japan)	2.31	15.9

Source: Author's estimates from PWT and WT data.

[a]Average annual GDP growth rate for each country has been estimated as follows:
$ln\ \text{GDP} = a + b\ \text{TIME}$
growth rate, $g = e^b - 1$.

[b]Average government expenditures shares are estimated over the period 1975 through 1985.

[c]Excluding Iran and Iraq which suffered from zero or negative growth.

tivity decline, while efficient intervention could enhance productivity. These subtleties notwithstanding, the evidence of a significant or insignificant statistical relationship between the growth of public expenditures and the GDP growth gives us an empirical basis for commenting on the effectiveness or otherwise of government control across countries.

The number of the empirical studies of the relationship between government and the economy is growing. Among the notable studies are those of Rubinson (1977); Landau (1983, 1985, 1986) and Ram (1986). Of these, only Ram (1986) used formal growth modelling and a combination of time series and cross-section data to refute the assertion of a negative impact of government on growth. He found instead a significant positive impact of government size on growth. Moreover, following Feder's (1982) analysis, he concluded that the provision of government services exerted a positive externality effect on the non-government sector.

With the exception of Ram (1986), who used limited time series data in his work, all the previous work involved cross-section studies, perhaps forced by the lack of adequate time series data. That problem may now be behind us owing to the compilation of the *Penn World Tables* [Summers and Heston (1988)], which provides time series data on 130 countries from 1950 through 1985 with inter-temporal and inter-spatial comparability. In addition, the *World Tables* of the World Bank has now compiled data on most member countries effectively from 1960.

Given that cross-section studies provide only average estimates of the critical coefficients that vary widely amongst countries with a diverse economic structure and environment, the present work seeks to test the empirical relationship between real government expenditures and the GDP growth entirely on the basis of time series data for all Asian countries[1] for which adequate and consistent data are available.[2] There are several advantages of such a time series study of the government-growth linkage: (a) the *a priori* assumption of the "universal homogeneity" of countries is no longer required and the differences in economic structure and environment of individual countries can be accounted for; (b) the parameter estimates

[1]Admittedly, the same exercise can be done for other continents, regions or country groups specified by per capita income or some other criterion. This exercise is designed to be a study of the Asian economies only.

[2]Time series data for 17 Asian countries (including Japan and the NICs) and 7 industrial market economies, covering a period of 26 to 36 years, were available from the *Penn World Tables* (Mark 4) see Summers and Heston (1988). To check consistency of results, we ran the model with an alternative data source, namely, the *World Tables* from the World Bank's database. However, consistent data were available for only 9 Asian countries (excluding the NICs). Those are not reported here for lack of space. Initially, the sample had included several more Asian countries (Kuwait, Saudi Arabia, Indonesia, Nepal, Papua New Guinea, and Afghanistan). The results for these countries had to be dropped from consideration as the models proved to be poor fits to the data, with coefficients of determination (R^2) well below 10 percent for each country. Data quality for all these countries except Indonesia was described by Summers and Heston (1988) as very poor.

are no longer aggregates or averages for a heterogeneous country group; (c) the parameter estimates could reflect differences in the intensity of policy-implementation or policy-effectiveness across countries, thus making some inter-country comparison possible; (d) in estimating growth models for individual countries, the factors explaining high growth in some countries could serve as a guide for development strategies in low growth countries.[3]

Furthermore, one of the major problems of past analysis stems from the fact that the size of government expenditures is strongly affected by the size of defence expenditures. In cross-section analysis, the negative correlation observed between the share of government expenditures and economic growth might well be attributed to the impact of defence expenditures on growth performance, which, most analysts argue, is negative. But this effect of military expenditures does not really shed much light on the effect of public civilian expenditures on growth. By using time series analysis in this study, the effect of this problem is reduced since in most countries the variance in defence expenditures over time is known to be less than the variance across countries. Moreover, the present exercise has the potential of providing some preliminary parameter estimates for each country.

III. MODELLING FRAMEWORK

With some modifications, the conventional aggregate production function framework is used here along the lines pursued in previous empirical studies explaining the 'sources of growth' [e.g., Solow (1957); Denison (1962, 1967); Robinson (1971); Feder (1982)]. Such a framework seems appropriate as it is proposed to model government services as an input, like capital or labour, in the aggregate production function,[4] whose generalised form may be expressed thus:

$$Q_t = F(K_t, L_t, G_t) \qquad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (1)$$

where Q = output (GDP);
K = capital stock;
L = labour; and
G = government input (measured by real government expenditures).

The subscript, t, indicates they are time variables.

Total differentiation and manipulation yields the growth equation of the form

[3]The deficiencies of cross-section analysis of the relationship between economic development and the public sector has been well-documented by [Afxentiou (1982), p. 35].

[4]Landau (1985) is content with using 'informal' models of the growth process relying on previous studies. In his 'estimating equation', the government expenditures variable enters as an explanatory variable along with several others.

$$\dot{Q}/Q = \alpha_K (I/Q) = \beta_L (\dot{L}/L) + \gamma (\dot{G}/G)(G/Q) \quad \ldots \quad \ldots \quad \ldots \quad (2)$$

The econometric specification of (2) may be written as

$$\dot{Q}/Q = \alpha_0 + \alpha_1 (I/Q) + \alpha_2 (\dot{L}/L) + \alpha_3 (\dot{G}/G)(G/Q) + u \quad \ldots \quad \ldots \quad (3)$$

where α_0 = constant term
u = stochastic component

Alternatively, the general formulation in (1), by total differentiation and manipulation yields

$$\dot{Q}/Q = S_K (\dot{K}/K) + S_L (\dot{L}/L) + S_G (\dot{G}/G) \quad \ldots \quad \ldots \quad \ldots \quad (4)$$

where S_K, S_L, and S_G are shares of capital, labour and government inputs in total product.

Assuming a constant output/capital ratio for the economy, i.e. $Q/K = b$, we get

$$\dot{Q}/Q = bS_K (\dot{K}/Q) + S_L (\dot{L}/L) + S_G (\dot{G}/G)$$

Adding a constant term and stochastic component, the estimating equation is

$$\dot{Q}/Q = \beta_O + \beta_1 (I/Q) + \beta_2 (\dot{L}/L) + \beta_3 (\dot{G}/G) + v \quad \ldots \quad \ldots \quad (5)$$

The difference between (3) and (5) lies in the government variable. The coefficient of the variable $(\dot{G}/G)(G/Q)$ in (3) gives an estimate of the overall impact of government size (indicated by the relative magnitude of government expenditures) on economic growth [Ram (1986), p. 193]. The coefficient of $(\dot{G}/G)$ in (5), on the other hand, simply gives the impact of the growth of government expenditures on the GDP growth. By examining the nature of the linkage between these two government variables and economic growth across countries, it might be possible to draw conclusions about the degree of government control and its impact on economic performance.[5]

IV. DATA, VARIABLES, AND METHODOLOGY

Unlike the previous studies of Feder (1982); Landau (1983, 1985, 1986) and

[5]Note that the variable, government expenditure share (G/Q), does not enter as a regressor in either of the models tested. This is firstly due to the fact that the derivations from conventional growth formulations that postulate government expenditure (G) as an input do not yield the variable, (G/Q). Inclusion of G/Q in the models estimated would likely result in mis-specification. Some model specification tests in cross-section studies documented by [Ram (1986), p. 198] showed the inferiority of the informal models, with G/Q as a regressor, to the conventional specifications used in the present study.

Ram (1986), the present study is based entirely on time series data from two alternative sources: Summers and Heston (1988), "A New Set of International Comparison of Real Product and Price Level Estimates for 130 Countries, 1950–85," in *Review of Income and Wealth,* (referred to here as PWT data), and *The World Tables,* 1988–89 edition of the World Bank (referred to here as WT data). The study was limited to a group of 13 developing Asian countries for which an adequate and consistent set of time series data were available.[6] The growth performance of these countries was contrasted with three Asian NICs, Japan, and seven industrial market economies. The PWT data covered annual observations on macroeconomic aggregates for over 30 years (1950–85) for as many as 12 Asian countries (including NICs and Japan), while for the rest the data were available for 25 years (1960–85). In contrast, the previous cross-section studies covered periods of ten to twenty years, and Ram's (1986) time series study covered only 20 years of data.

Given the time-period covered in this study, the sample for each country fulfilled the criterion of a large sample and one could rely on the rigour of the statistical estimates. Although the growth models tested were uniform for all countries, yet wide parametric variations were captured in this study which would allow cross-country comparisons of the relative impacts of the crucial factors on economic growth. Both the PWT and the WT data are compiled on an internationally comparable basis, although different methodologies were followed.[7]

This study used data in constant local currency so that all variables were expressed in real terms and were comparable over time (though not necessarily across countries).[8] For all the variables whose growth rates are incorporated into the model, the first differences of the natural logarithms of the variables in question were used to approximate the annual rates of growth.[9]

[6]This is merely one study that could be replicated for other homogeneous groups of countries, grouped together on the basis of geography, income, government structure, or market orientation.

[7]For details on the methodologies used, see the section on Sources and Methods, pp. 4–6, *World Tables*, 1988-89 edition, The World Bank, and [Summers and Heston (1988), pp. 12–23].

[8]Although the PWT data are comparable across countries, the international comparability of the WT data is questionable, since the only transformation done in the *World Tables* was to use the exchange rate for a specific base year as the conversion factor for individual countries. This raises a whole lot of questions about the international comparability of the data based on a single conversion factor. For example, domestic prices of government services are typically lower than the prices of investment goods in the LDCs. Many of the complex issues of comparability have been addressed, albeit partially, in the United Nations International Comparisons Project, which led to the compilation of PWT, but a discussion of them here is beyond our scope.

[9]That is, $\dot{Q}/Q = ln\,(Q_t/Q_{t-1})$

Since $ln\,(Q_t/Q_{t-1}) = \Delta ln(Q_t)$

$= d/dt\,[ln\,Q_t]$

$= (\dot{Q}/Q)$.

Economic growth is proxied by the annual growth rates of GDP ($\dot{Q}/Q$). The variable, (I/Q), was created by taking the percentage share of the "gross domestic investment" in the GDP. As in all previous studies, population growth ($\dot{L}/L$) substituted for labour force growth, a variable for which very limited time series data appear to be available. Annual data on population are more readily available, and population growth has been considered by many to be a suitable proxy for labour force growth and, therefore, has been used widely in previous studies. "Government consumption expenditures" are used as the proxy for "government intervention". Although so defined in the Summers-Heston (1988) study, it is well-known that the government expenditure variable, G, includes a substantial proportion of public investment expenditure, and this proportion is believed to be larger in the LDCs as compared to the developed economies because of the relatively greater need for public investment in social and physical infrastructure by the LDCs. We worked on *a priori* reasoning that the increases in government expenditures were symptomatic of the degree of government involvement in the economy. Two government intervention variables were tested, namely, ($\dot{G}/G$)(G/Q), and ($\dot{G}/G$). It may be noted that while ($\dot{G}/G$) simply measures the growth of government expenditures, the variable ($\dot{G}/G$)(G/Q) reflects the growth of government relative to the economy and is designed to capture the overall impact of the increasing government intervention in the economy.[10]

It may be noted that the presumed direction of causality in the model is from G to Q and not vice versa, an assumption that is in conflict with Wagner's hypothesis. The approach taken here is reminiscent of the style of Solow-Denison and, more recently, of Feder-Ram. We have followed the 'sources of growth' approach of these studies to capture the impact of government size–as an input in the aggregate production function–on the growth of output, given a level of capital stock and the labour force. The results of empirical tests about the existence of bi-directional causality do not appear inconsistent with the conclusion of a positive impact of government size on economic growth in Asian countries [see Ram (1989), p. 283)]. The more serious concern is with regard to the simultaneous-equation problem arising from the fact that the government expenditure variable is a regressor in a model with the GDP growth as the dependent variable. Exogeneity tests, applying the procedure proposed by Nakamura and Nakamura (1981),[11] on a random sample

[10]Since (G/Q) = ($\Delta G/G$) (G/Q) ≈ ($\dot{G}/G$)(G/Q).
One interpretation of the final expression, ($\dot{G}/G$)(G/Q), is that it represents the growth of government weighted by the share of government expenditures in the GDP.

[11]Exogeneity tests were performed on the variables, (G/Q) and ($\dot{G}/G$)(G/Q). The tests involved regressing the government variables on the set of available instruments from the Summers-Heston dataset, viz., consumption, time trend, and the constant term (required), augmenting the original equation by the estimated residuals, and testing for the joint significance of the new variables in the augmented equations. In 14 of the 20 regressions, the computed F-statistics were insignificant at the 5 percent level. Thus, only a mild concern over endogeneity is warranted.

of 10 countries (using Equations 3 and 5) showed that, in an overwhelming majority of cases, the computed F-statistics were below the critical values, enabling us to reject the hypothesis of endogeneity with confidence.

V. EMPIRICAL RESULTS

Empirical results from the two models based on Equations (3) and (5) are summarised in Tables 2, 3, and 4. For the NICs and G-7 countries, the equations have been estimated using two data sources (PWT and WT) which allows us to test for the consistency of model outcomes. The robustness of the results is confirmed by the close correspondence of the estimates from both sources of data.

1. As for the "goodness of fit" of the models, it appears that Equations (3) and (5) fit both data satisfactorily. The explanatory power of the models is somewhat similar to the previous estimated models of growth [Ram (1986); Feder (1982)]. The presence of serial correlation was observed in practically all cases. Therefore, all estimates are based on the AR1 procedure of TSP.[12] In the rare instance, where first-order serial correlation (P) was not significant at the 10 percent level, the standard OLS technique was applied.
2. Regression F-statistics are found to be significant at least at the 10 percent level for 15 of the 16 Asian countries in Table 2, while they are significant in all cases for the industrial market economies from both data sources.
3. It appears that the population growth variable ($\dot{L}/L$) is generally insignificant for all countries, although the expected coefficient in the standard neoclassical version is positive. This discrepancy between the outcome of the present exercise and that of the neoclassical model may be explained by the fact that population growth in our model proxies for labour force growth. Indeed, the appropriate variable for labour-surplus Asia should be employment growth (for which long-time series data are unavailable for most countries). The present results could be explained by the absence of a correlation between employment and population growth.
4. As expected, the coefficient of the capital accumulation variable (I/Q) comes out to be generally positive and significant. This is confirmed by the results for both Asian and industrial market economies.
5. The coefficients of both the government variables were found to be statistically significant at the 5 percent level for all the Asian LDCs in ques-

[12]The AR1 procedure uses an auto-correlation correction under the postulate of the first-order serial correlation in the error term.

Table 2

Time Series Estimates Based on PWT Data, 1950–85
Government Control and Economic Growth–Asian Countries

	Model A: Equation (3)				Model B: Equation (5)			
Country	$(\dot{L}/L)$	(I/Q)	*GOVA*	$R^2(F)$	$(\dot{L}/L)$	(I/Q)	*GOVB*	$R^2(F)$
Bangladesh	2.02	0.92	2.16	0.42	2.02	0.88	0.22	0.48
(1959–85)	(1.52)	(1.43)	(2.76)[a]	(3.82)[a]	(1.60)	(1.44)	(3.29)[a]	(4.90)[a]
Burma	–1.79	0.46	1.99	0.39	–1.57	0.45	0.30	0.31
	(–1.02)	(1.94)[b]	(4.06)[a]	(4.78)[a]	(–0.82)	(1.79)[b]	(3.28)[a]	(3.37)[a]
Hong Kong	–0.20	1.38	0.28	0.59	–0.21	1.38	0.01	0.59
(1960–85)	(–0.45)	(4.85)[a]	(0.60)	(10.27)[a]	(–0.46)	(4.77)[a]	(0.53)	(10.20)[a]
India	1.21	1.29	0.89	0.65	1.20	1.31	0.19	0.68
	(0.76)	(3.54)[a]	(6.84)[a]	(14.0)[a]	(0.78)	(3.77)[a]	(7.31)[a]	(16.0)[a]
Iran	–0.31	1.04	2.20	0.40	–0.05	1.01	0.34	0.43
(1955–85)	(–0.28)	(2.92)[a]	(2.84)[a]	(5.79)[a]	(–0.05)	(2.89)[a]	(3.11)[a]	(6.52)[a]
Iraq	–3.46	0.96	3.57	0.46	–2.48	1.19	0.57	0.42
(1953–85)	(–0.48)	(1.65)	(2.17)[a]	(7.86)[a]	(–0.31)	(2.06)[a]	(1.68)	(6.74)[a]

Continued–

Table 2 –(*Continued*)

Israel	1.30	1.0	0.25	0.87	1.20	0.99	0.11	0.89
	(6.62)[a]	(12.14)[a]	(2.97)[a]	(70.6)[a]	(6.41)[a]	(12.8)[a]	(3.8)[a]	(83.3)[a]
Jordan	2.39	0.64	0.88	0.23	1.93	0.62	0.32	0.26
(1954–85)	(0.73)	(1.25)	(1.71)[b]	(2.7)[b]	(0.59)	(1.24)	(1.97)[b]	(3.08)[a]
S. Korea	–0.99	0.75	0.20	0.73	–0.95	0.75	0.05	0.73
(1953–85)	(–1.23)	(8.02)	(0.32)	(24.7)[a]	(–1.21)	(7.87)[a]	(0.48)	(24.6)[a]
Malaysia	–1.24	0.90	1.19	0.64	–1.31	0.87	0.24	0.67
(1955–85)	(–0.66)	(4.9)[a]	(1.77)[b]	(15.3)[a]	(–0.74)	(4.83)[a]	(2.28)[a]	(17.2)[a]
Pakistan	1.34	0.34	1.30	0.57	1.16	0.32	0.25	0.54
	(3.58)[a]	(2.08)[a]	(6.23)[a]	(13.9)[a]	(3.09)[a]	(1.81)[b]	(5.91)[a]	(12.2)[a]
Philippines	1.29	0.71	1.65	0.54	1.24	0.72	0.30	0.59
	(1.43)	(2.41)[a]	(2.96)[a]	(12.2)[a]	(1.42)	(2.58)[a]	(3.38)[a]	(14.9)[a]
Singapore	2.0	0.40	2.17	0.28	1.25	0.41	0.22	0.29
(1960–85)	(0.40)	(1.60)	(1.30)	(1.99)	(0.31)	(1.65)	(1.33)	(2.02)
Sri Lanka	–1.94	0.57	0.99	0.43	–1.59	0.50	0.27	0.47
	(–1.72)[b]	(2.73)[a]	(3.83)[a]	(7.9)[a]	(–1.51)	(2.46)[a]	(4.26)[a]	(9.3)[a]

Continued–

Table 2 –(*Continued*)

	Model A: Equation (3)				Model B: Equation (5)			
Country	$(\dot{L}/L)$	(I/Q)	*GOVA*	$R^2(F)$	$(\dot{L}/L)$	(I/Q)	*GOVB*	$R^2(F)$
Syria	–11.22	1.45	2.0	0.65	–9.85	1.35	0.36	0.66
(1960–85)	(–2.25)[a]	(4.20)[a]	(2.36)[a]	(13.1)[a]	(–2.06)[a]	(3.85)[a]	(2.6)[a]	(13.8)[a]
Thailand	0.23	0.82	1.12	0.49	0.15	0.79	0.15	0.52
	(0.27)	(3.78)[a]	(1.70)[b]	(7.12)[a]	(0.19)	(3.73)[a]	(2.07)[a]	(7.99)[a]

Source: Penn World Table (Mark 4), 1988.

(·) All regressions include a constant term whose estimated is not reported to save space. t-statistics are in parentheses.
Regression F-statistics are in parentheses under estimated R^2.
GOVA = government variable, $(\dot{G}/G)(G/Q)$.
GOVB = government variable, $(\dot{G}/G)$.
[a]Significant at least at the 5 percent level.
[b]Significant at least at the 10 percent level.

Table 3

Government and Growth in Leading Industrial Market Economies: Time Series Results Using PWT Data, 1950–85

	Model A: Equation (3)				Model B: Equation (5)			
Country	$(\dot{L}/L)$	(I/Q)	*GOVA*	$R^2(F)$	$(\dot{L}/L)$	(I/Q)	*GOVB*	$R^2(F)$
Canada	–6.02	0.78	0.89	0.42	–5.98	0.77	0.13	0.43
	(–3.06)[a]	(3.01)[a]	(1.79)[b]	(5.54)[a]	(–3.07)[a]	(2.96)[a]	(1.8)[b]	(5.6)[a]
France	0.70	0.45	0.13	0.66	0.71	0.45	0.03	0.66
	(0.82)	(5.25)[a]	(0.54)	(14.45)[a]	(0.83)	(5.19)[a]	(0.74)	(14.6)[a]
Germany	–5.09	1.57	–0.14	0.55	–5.08	1.57	–0.02	0.55
	(–2.71)[a]	(5.63)[a]	(–0.19)	(9.06)[a]	(–2.71)[a]	(5.62)[a]	(–0.17)	(9.1)[a]
Italy	–8.25	0.66	1.27	0.48	–8.33	0.64	0.22	0.48
	(–2.13)[a]	(3.94)[a]	(1.57)	(6.9)[a]	(–2.15)[a]	(3.85)[a]	(1.49)	(6.79)[a]
Sweden	–0.67	0.34	0.81	0.24	–0.69	0.34	0.21	0.25
	(–0.37)	(2.29)[a]	(1.17)	(2.41)[b]	(–0.39)	(2.32)[a]	(1.27)	(2.48)[b]
UK	0.42	0.84	0.36	0.63	0.38	0.84	0.10	0.63
	(0.46)	(6.93)[a]	(1.24)	(12.6)[a]	(0.43)	(7.01)[a]	(1.47)	(12.9)[a]
USA	1.11	1.28	0.29	0.53	1.07	1.28	0.05	0.53
	(0.48)	(5.16)[a]	(1.32)	(8.61)[a]	(0.46)	(5.09)[a]	(1.26)	(8.5)[a]

Continued–

Table 3 –(*Continued*)

Country	Model A: Equation (3)				Model B: Equation (5)			
	$(\dot{L}/L)$	(I/Q)	*GOVA*	$R^2(F)$	$(\dot{L}/L)$	(I/Q)	*GOVB*	$R^2(F)$
Hong Kong	–0.20	1.38	0.28	0.59	–0.21	1.38	0.01	0.59
(1960–85)	(–0.45)	(4.85)[a]	(0.60)	(10.27)[a]	(–0.46)	(4.77)[a]	(0.53)	(10.2)[a]
S. Korea	–0.99	0.75	0.20	0.73	–0.95	0.75	0.05	0.73
(1953–85)	(–1.23)	(8.02)	(0.32)	(24.7)[a]	(–1.21)	(7.87)[a]	(0.48)	(24.6)[a]
Singapore	2.0	0.40	2.17	0.28	1.25	0.41	0.22	0.29
(1960–85)	(0.40)	(1.60)	(1.30)	(1.99)	(0.31)	(1.65)	(1.33)	(2.02)
Japan	–3.32	0.42	0.17	0.55	–3.31	0.42	0.04	0.55
	(–2.74)	(4.03)[a]	(0.34)	(9.25)[a]	(–2.72)[a]	(3.99)[a]	(0.43)	(9.34)[a]

Source: *Penn World Table* (Mark 4) Databank, 1988.

(·) All regressions include a constant term whose estimate is not reported to save space. *t*-statistics are in parentheses. Regression *F*-statistics appear in parentheses under R^2.

GOVA = government variable, $(\dot{G}/G)(G/Q)$.

GOVB = government variable, $(\dot{G}/G)$.

[a]Significant at least at the 5 percent level.

[b]Significant at least at the 10 percent level.

Table 4

Government and Growth in Leading Industrial Market Economies
Time Series Results Based on WT Data, 1960–88

	Model A: Equation (3)				Model B: Equation (5)			
Country	$(\dot{L}/L)$	(I/Q)	*GOVA*	$R^2(F)$	$(\dot{L}/L)$	(I/Q)	*GOVB*	$R^2(F)$
Canada	2.19	0.85	–0.52	0.68	2.19	0.86	–0.10	0.68
	(1.76)[b]	(6.67)[a]	(–0.85)	(16.9)[a]	(1.74)[b]	(6.72)[a]	(–0.80)	(16.8)[a]
France	2.10	0.33	1.68	0.69	2.09	0.31	0.29	0.68
	(1.83)[b]	(2.56)[a]	(1.19)	(12.8)[a]	(1.81)[a]	(2.43)[a]	(1.07)	(12.5)[a]
Germany	–2.69	1.23	–1.28	0.59	–2.73	1.24	–0.24	0.59
	(–2.04)[a]	(5.02)[a]	(–1.42)	(11.67)[a]	(–2.05)[a]	(5.05)[a]	(–1.32)	(11.5)[a]
Italy	–0.26	0.77	–0.58	0.32	–0.37	0.77	–0.06	0.32
	(–0.07)	(2.79)[a]	(–0.15)	(3.72)[a]	(–0.10)	(2.79)[a]	(–0.09)	(3.7)[a]
Sweden	1.16	0.73	0.68	0.70	0.91	0.73	0.21	0.72
	(1.18)	(5.95)[a]	(1.26)	(18.2)[a]	(0.92)	(6.05)[a]	(1.56)	(19.8)[a]
UK	0.81	1.01	0.47	0.78	0.79	1.01	0.11	0.78
	(1.07)	(8.67)[a]	(0.83)	(27.7)[a]	(1.05)	(8.74)[a]	(0.94)	(27.9)[a]
USA	2.87	1.31	0.61	0.51	3.01	1.31	0.13	0.51
	(1.52)	(4.66)[a]	(0.91)	(8.3)[a]	(1.64)	(4.64)[a]	(0.83)	(8.26)[a]

Continued–

Table 4 –(*Continued*)

Country	Model A: Equation (3)				Model B: Equation (5)			
	$(\dot{L}/L)$	(I/Q)	*GOVA*	$R^2(F)$	$(\dot{L}/L)$	(I/Q)	*GOVB*	$R^2(F)$
Hong Kong	–0.39	0.85	3.23	0.52	–0.40	0.84	0.27	0.53
	(–0.85)	(4.80)[a]	(1.33)	(8.60)[a]	(–0.87)	(4.85)[a]	(1.56)	(8.99)[a]
S. Korea	–1.58	0.55	–1.37	0.51	–1.66	0.54	–0.12	0.49
	(–1.19)	(4.94)[a]	(–1.41)	(8.25)[a]	(–1.28)	(4.76)[a]	(–1.05)	(7.7)[a]
Singapore	–0.11	0.58	0.43	0.43	–0.24	0.57	0.06	0.43
	(–0.11)	(4.01)[a]	(0.49)	(6.04)[a]	(–0.22)	(3.95)[a]	(0.66)	(6.15)[a]
Japan	0.39	0.93	3.13	0.86	–0.10	0.91	0.41	0.86
	(0.37)	(6.55)[a]	(1.13)	(11.5)[a]	(–0.11)	(6.76)[a]	(1.18)	(36.16)[a]

Source: World Tables Datafiles of the World Bank (Taiwan data unavailable in WT).

(·) All regressions include a constant term whose estimate is not reported to save space. *t*-statistics are in parentheses. Regression *F*-statistics are in parentheses under R^2 for each country.

GOVA = government variable, $(\dot{G}/G)(G/Q)$.

GOVB = government variable, $(\dot{G}/G)$.

[a]Significant at least at the 5 percent level.

[b]Significant at least at the 10 percent level.

tion, except Hong Kong, Korea, and Singapore. To check if this result held for an alternative data source, estimates were done for the NICs using WT data and the previous results were confirmed (see Table 4, bottom panel). Interestingly enough, the same regressions run for 7 industrial market economies using both data sources produced an outcome similar to the ones for the three NICs (top panel, Tables 3 and 4).[13]

6. It is worth pointing out that, during the past three decades, there have been notable shifts in the composition of government spending in several Asian countries. In particular, the share of defence expenditure has been declining while the spending on economic infrastructure has been rising steadily in such countries as Malaysia, the Philippines, Thailand, India, Pakistan, and Singapore. However, the share of defence expenditures continue to rise in South Korea. The empirical results generally confirm this trend as the link between the GDP growth and the spending on economic infrastructure is expected to be strong. The remarkable rise in the share of social expenditures (education, housing, health) in Singapore during the 1980s implies a weaker contemporaneous link between public spending and the GDP growth as the productivity effects of such expenditure are felt after a lag. The absence of a lag structure in the model precludes capturing the belated effect.

VI. CONCLUSIONS

The empirical evidence (Table 2) suggests that, for most Asian countries, government control over the economy has, on balance, produced a positive impact on economic growth thus far. It is arguable that the efficiency-enhancing roles of government (e.g., addressing market failures, providing social and economic infrastructure) outweighed the efficiency-reducing forms of intervention (e.g., public sector enterprises, price and quantitative controls), leaving a net positive impact on overall economic performance. For low-income and lower middle-income Asia, high growth is necessary to catch up with the higher living standards of the developed world. Thus far, they have experienced an average growth rate of about 5 percent during 1975–85 (see Table 1). Evidence from the present study suggests

[13]The insignificance of the coefficients of the government variable is indicative of the rather "passive" or indirect role of the government in the economy, as can be seen in the developed industrial market economies. Although in Table 3, the coefficients for the government variables for Canada appear to be significant at the 10 percent level, estimates with the WT data in Table 4 show no significant relationship. Curiously enough, Ram's (1986) own findings based on limited time series data showed that the coefficients of the government variable were indeed insignificant for the following developed market economies: U.S.A., U.K., Germany, Italy, Denmark, Belgium, Switzerland, Netherlands, and New Zealand see [Ram (1986), pp. 200-201, Table 3].

that government size has not had a deleterious impact on economic performance so far.

A plausible inference for the NICs might be that part of the government expenditure that fluctuates the most might not be related to economic growth. For South Korea, it might be military expenditures; for Hong Kong, it might be related to refugee absorption. If such is indeed the case, there is no reason to expect public expenditures on the military or refugee absorption to impact favourably on economic growth.

For the industrial market economies, a possible explanation for the insignificant government coefficients might be that negative causality exist and runs the other way (growth of the GDP to government expenditures). During periods of recession, when economies are on the decline, these welfare states spend much more on unemployment insurance, welfare, and other transfer payments,--spending that is generally expected to halt the slide but lacks the ingredients to stimulate growth. The LDCs do not have this kind of massive counter-cyclical welfare expenditures. Quite apart from the temporary rise in transfer payments due to recessions, it is a documented fact that the massive growth in public expenditures in the developed democracies may be accounted for by the rapid growth in the size of the welfare state with burgeoning social expenditures.

Finally, public sector inefficiencies in most LDCs are almost proverbial. Although economic theory supports government intervention in the market to correct the distortions or market failures, it presupposes efficient intervention. Inefficient intervention might not generate the well-being intended; at worst, it could reduce productivity and welfare. In developing Asia, the evidence presented in the present study suggests that, on a net basis, the productivity-generating expenditures of government have outweighed the productivity-reducing inefficiencies in this region.

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