FUNCTIONAL ESTIMATES OF JAPANESE GOVERNMENT DOMESTIC EXPENDITURES, FISCAL 1952–1963

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The purpose of the paper is to describe current and constant price estimates of Japanese central and local government postwar domestic expenditures by economic type and function recently completed by Miss Yoshiko Kido, International Christian University, Tokyo, and myself. The rationale of the functional classification is to estimate those government expenditures which enhance the economy's productive capacity.

Expenditures are divided into four broad functional categories: developmental, disaster repair and prevention, social welfare, and general government. These four categories are subdivided to two levels of disaggregation. We were able to break down government fixed investment, government enterprise inventory investment, current domestic transfers and subsidies into 42 functional components. For constant price series, each functional component by economic type was deflated by separate price indexes. We followed the Economic Planning Agency's procedure for the official national accounts of assuming no productivity change in the provision of government services.

Our results are generally comparable to the official national accounts estimates. The major difference is that we attribute considerably more fixed investment to local governments, and correspondingly less to the central level.

Government expenditures had the following characteristics. Growth was rapid; in real terms the public sector use of the economy's resources in 1963 was 2.2 times more than in 1952. The elasticity of government expenditures to GNP was unity in current prices, slightly less in real terms. The government postwar share in GNP has been smaller than in European nations and, unlike them, was not rising. This reflects the underlying growth strategy of emphasis upon private business fixed investment. Government consumption expenditures declined relative to GNP, and investment rose.

Developmental expenditures comprised the largest share (40–45 per cent) of the government total. The elasticities to GNP of government expenditures by economic and functional categories are provided and discussed.

A simple test was made of the cyclical relationship of government expenditures (both total and by category) to GNP. The results suggest that government expenditures, rather than contra-cyclical, were pro-cyclical in effect.

The purpose of this paper is to describe current and constant price estimates of Japanese government domestic expenditures by economic type and function recently completed by Miss Yoshiko Kido of International Christian University, Tokyo and myself.[1] I do not include the detailed estimates here, but they are available upon request.

Our estimates differ from others for Japanese government expenditures in comprehensiveness of coverage, system of functional classification, and detail of functional breakdown. Professors Emi and Shionoya of Hitotsubashi University have published the most detailed estimates available thus far, covering the period

1. Hugh T. Patrick and Yoshiko Kido, *Estimates of Japanese Government Annual Domestic Expenditures, 1952–1963*, July 1967, 112 pp. mimeographed. We are indebted to Mr. Bunji Goto, Chief, National Accounts Division, Economic Research Institute, Economic Planning Agency, and many of his staff, for their invaluable assistance in making these estimates.

1868 to 1960, while Professor Oshima of the University of Hawaii has prepared but not yet published detailed functional estimates for central government for 1868–1912.[2] The Emi-Shionoya functional estimates include both central and local governments, but with different classification methods. Their consolidated table has only four functional components: military expenditure, national debt, non-military capital expenditure, and other.[3] The Ministry of Finance has estimated functional-economic expenditures for the central government since 1958, based on the UN, Economic Commission for Asia and the Far East system with minor modifications.[4] Coverage excludes local governments, however; in addition, the central government sector is defined somewhat more narrowly than the official national income accounting system of the Economic Planning Agency (EPA). EPA experimentally prepared economic-functional estimates on the UN classification basis for 1952, 1956, 1960, and 1964, but has not continued this activity.[5]

Our estimates are only for the postwar period. The 1945–1951 data, particularly for local governments, are too poor to use; our estimates are probably increasingly accurate in the latter part of the period. Our coverage, however, is broader than that of Emi and Shionoya. Essentially we adopt the EPA national income accounts definition of the government sector, including government enterprise (investment only) as well as general government. In principle our current price totals by economic type of expenditure are identical with those of EPA, though in fact there are some, relatively small, differences. Our economic classification consists of gross fixed investment, government enterprise inventory investment, and consumption (current purchases of goods and services), which subtotal to government purchases of goods and services, plus current subsidies and current domestic transfer payments. Transfers to the rest of the world are excluded; the amounts (mainly reparations payments) have been small, less than one per cent of total government expenditures over 1952–1963. Capital account loans and transfers are also excluded.

The estimates are disaggregated by central and local government, with intra-governmental transfers and other duplications eliminated. In principle, all expenditures are attributed to the level of government at which they actually occur, rather than the level of initial financing. Expenditures are actual, on a fiscal year[6] closed budget basis; they are in both current and, for purchases of goods and services, 1960 constant prices.

2. Koichi Emi and Yuichi Shionoya, *Zaisei Shishutsu* (Government Expenditures), Vol. 7 in Ohkawa, Shinohara, and Umemura, ed., *Choki Keizai Tokei* (Estimates of Long-Term Economic Statistics of Japan since 1868), Tokyo: Toyo Keizai Shimposha, 1966; Koichi Emi, *Government Fiscal Activity and Economic Growth in Japan 1868–1960*, Tokyo: Kinokuniya, 1963; Harry T. Oshima, *Preliminary Summary Table: Functional Classification of Meiji Central Government Expenditures by Economic Type*, 1961, mimeographed.

3. *Op. cit.*, Table 14, pp. 212–3.

4. Ministry of Finance, *Zaisei Tokei* (Statistics of Public Finance), annual, various issues.

5. EPA, Domestic Research Section, *Zaisei Shishutsu Pattern no Henka* (Changes in the Pattern of Government Expenditures), May 12, 1965, mimeographed. The estimates appear in EPA, *Economic Survey of Japan, 1964–1965*, Annex Table 51, pp. 216–7.

6. The fiscal year begins April 1 of the calendar year and ends the following March 31.

Our system of functional classification differs from the standard UN system[7] in that it emphasizes the economic growth-inducing components of government expenditures. For the analysis of the relationship between government expenditures and economic growth, the use merely of economic categories (such as investment and consumption) is clearly too simple. While much of government current purchases of goods and services may not have significant impact upon the economy's capacity to expand output, clearly certain types do. Similarly, not all government investment contributes significantly to the economy's ability to produce. An appropriate functional classification hence provides a better basis for focusing on the growth (or social welfare, or other) impacts of government expenditures.

We have four broad functional categories: developmental, disaster repair and prevention; social welfare; and general government (see Table 1). Disaster is placed in a separate category because data are available; because expenditures are not negligible (5–8 per cent of total expenditures, 11–21 per cent of fixed investment) due to the prevalence of typhoons and earthquakes in Japan; and because disaster expenditures do not fit clearly into either developmental or social welfare categories, though on the whole they are more related to development. Moreover, expenditures for disaster repair and prevention do not directly contribute to an increase in the economy's capacity to produce, except in a probabilistic sense, but do offset a reduction in that capacity. (Health expenditures might well be treated similarly—as a prevention of the deterioration of human capital—though we do not do so.)

These four categories are subdivided to two levels of disaggregation, as shown in Tables 1 and 2. The main reason for two levels is that we have not made independent functional estimates of government consumption, but have extrapolated from the benchmark years of the EPA study.[8] The EPA estimates have only the ten subcategories we use in Table 1. Our only justification is pragmatic; we simply did not have time to examine central and local government budgets item by item. However, we were able to disaggregate fixed investment, inventory investment, subsidies, and domestic transfer payments into the 42 components listed in Table 2.[9]

The allocation of certain types of expenditures between developmental and social welfare has its arbitrary elements. Perhaps the most debatable are education, housing and health, since all contain a mixture of developmental and social welfare (or consumption) activities. We feel that for postwar Japan, educational expenses have been more directly growth-inducing than either the government's

7. The United Nations, *A Manual for Economic and Functional Classification of Government Transactions*, 1958 (58 XVI. 2).

8. EPA, *op. cit.*

9. In making our detailed functional estimates of gross fixed investment by level of government and by general government or government enterprise, our data resulted in a few conceptually impossible cases of negative estimates. We believe that the negative figures result from errors in the basic sources in consolidation and attribution to level of government. We could have eliminated the negative items by subtracting them from other governmental units for the same functional item, but decided not to do so in order to indicate that the problem exists, even though the amounts are not large.

TABLE 1

CENTRAL AND LOCAL GOVERNMENT DOMESTIC EXPENDITURES
(100 million yen, current prices)

	Investment			Consumption	Goods and Services Subtotal	Transfer Payments	Subsidies	Grand Total
	Fixed	Inventories	Subtotal					
			1962					
I. Developmental	14380	126	14506	7822	22328	77	109	22514
Agriculture	1569	−15	1554	671	2225	4	23	2252
Mining and Manufacturing	155	5	160	253	413	7	24	444
Transport and Communications	9410	128	9538	91	9629	1	13	9643
Power and Water	709	4	713	—	713	—	1	714
Education	1941	—	1941	6728	8669	65	25	8759
Others	596	4	600	79	679	—	23	702
II. Disaster	2545	—	2545	127	2672	—	14	2686
III. Social Welfare	2978	−261	2717	2519	5236	5053	632	10921
IV. General Government	1479	—	1479	8709	10188	2805	1	12994
General	1074	—	1074	7107	8181	2801	1	10983
Defense	405	—	405	1602	2007	4	—	2011
V. Total	21382	−135	21247	19177	40424	7935	756	49115
			1963					
I. Developmental	16484	−32	16452	9236	25688	174	147	26009
Agriculture	1966	24	1990	795	2785	11	47	2843
Mining and Manufacturing	173	63	236	284	520	44	43	607
Transport and Communications	10752	−119	10633	107	10740	1	—	10741
Power and Water	967	4	971	—	971	—	—	971
Education	2017	—	2017	7963	9980	118	31	10129
Others	609	−4	605	87	692	—	26	718
II. Disaster	2689	—	2689	193	2882	—	11	2893
III. Social Welfare	3501	−359	3142	3101	6243	6264	794	13301
IV. General Government	1548	—	1548	10267	11815	3381	—	15196
General	1129	—	1129	8347	9476	3380	—	12856
Defense	419	—	419	1920	2339	1	—	2340
V. Total	24222	−391	23831	22797	46628	9819	952	57399

housing or health expenditures. Certain agricultural expenditures, while nominally developmental in intent, may be social welfare in fact. Another divergence from standard proccdures is to treat a part of defense expenditures as investment. Defense investment is defined narrowly to consist only of investment goods which are capable of alternative civilian uses; examples are trucks and some buildings. Because our estimates are relatively disaggregated, users can reorganize the data on the UN functional basis or any other system they wish.

Similarly, those who wish to define the government sector more narrowly to exclude government enterprise can readily do so from the basic estimates of fixed and inventory investment. As is implied by Table 2, most government enterprises engage in activities similar to government enterprises in other countries. Possible exceptions include the two largest in terms of fixed investment —Japan Telegraph and Telephone Corporation (a monopoly), and Japan National Railways (which owns all but a few short-distance commuter lines). Together they did almost half of government enterprise fixed investment over the period. Government enterprise is not inconsequential. Its share of fixed investment rose from 30 per cent to 43 per cent over the period. Its fixed plus inventory investment increased from 12 to 22 per cent of government purchases of goods and services, and from 10 to 18 per cent of total expenditures.

The basic budgetary data are excellent for the central government; while less so for local governments, they are nonetheless quite comprehensive. However, the data are complicated by a bewildering variety of special accounts and government enterprises at both central and local levels, and by numerous intragovernmental transfers among these separate budgetary units. We made our estimates originally on the basis of the old national accounts definitions and data, but revised our data to conform with the new national accounts first published in 1966.[10]

The totals of our current price estimates for government domestic expenditures and for purchases of goods and services are very close to those of the EPA official national accounts. Our government gross fixed investment estimates average about 3 per cent less than those of EPA. The primary reason is that we relied mainly upon Ministry of Local Autonomy studies to obtain consolidated, comprehensive, and detailed estimates of all local and certain specified central government fixed investment expenditures. Since in principle we estimated total consumption as a residual from EPA statistics of government purchases of goods and services, our consumption estimates naturally are larger (by about 3 per cent) than those of EPA. A minor difference remains between our and EPA estimates of purchases of goods and services. In making the adjustments from the old to the new national accounts system we relied on EPA worksheets and instructions; some worksheets were lost and occasionally no one remembered precisely what adjustments had been made.

To deflate current price data into fiscal 1960 constant prices, we generally used the procedures applied by EPA, including the assumption of no increase in the productivity of factor inputs. The materials and personnel components of

10. EPA, *Kokumin Shotoku Tokei Nempo, 1966* (Annual Report on National Income Statistics, 1966), and further minor changes as enumerated in the 1967 edition.

TABLE 2

CENTRAL AND LOCAL GOVERNMENT FIXED INVESTMENT, 1960
(million yen, current prices)

	Central Government			Local Government			Grand Total
	General	Enterprise	Sub-Total	General	Enterprise	Sub-Total	
I. Developmental	80,310	345,381	425,691	309,190	79,575	388,765	814,456
A. Agriculture	23,843	30,334	54,177	68,379	2,770	71,149	125,326
Land Improvement	23,456		23,456	29,659		29,659	53,115
Land Development	5,032		5,032	3,425		3,425	8,457
Agricultural Machinery		242	242				242
Irrigation	−5,176	11,823	6,647	670		670	7,317
Meadow Improvement				622	983	1,605	1,605
Forest and Forest Roads	−83	18,269	18,186	13,266		13,266	31,452
Fish Ports	614		614	7,344		7,344	7,958
Others				13,393	1,787	15,180	15,180
B. Mining				777		777	777
C. Manufacturing		4,580	4,580				4,580
Tobacco		3,317	3,317				3,317
Printing		1,511	1,511				1,511
Other		−248	−248				−248
D. Transport	52,098	131,358	183,456	123,897	35,667	159,564	343,020
Railroads		98,917	98,917				98,917
Roads and Bridges	38,076	16,599	54,675	107,679		107,679	162,354
Airports	1,784		1,784	323		323	2,107
Harbors	12,338	736	13,074	15,895	15,129	31,024	44,098
Local Transport		15,106	15,106		20,538	20,538	35,644
E. Communications		132,215	132,215				132,215
Telephone and Telegraph		129,860	129,860				129,860
Others		2,355	2,355				2,355

F. Power and Water		46,531	46,531		21,422	21,422	67,953
Electricity		43,010	43,010		14,088	14,088	57,098
Gas					1,048	1,048	1,048
Nuclear		3,521	3,521				3,521
Industrial Water					6,286	6,286	6,286
G. Development Financial Institutions		363	363				363
H. Educational Facilities	4,337		4,337	99,549		99,549	103,886
I. City Planning	32		32	16,588		16,588	16,620
J. Others					19,716	19,716	19,716
II. Disaster Prevention and Reconstruction	39,401		39,401	158,835		158,835	198,236
A. Rivers and Dams	24,849		24,849	24,934		24,934	49,783
B. Seaside	11,179		11,179	15,062		15,062	26,241
C. Flood Control	736		736	7,591		7,591	8,327
D. Repairs	2,637		2,637	111,248		111,248	113,885
III. Social Welfare	2,213	17,841	20,054	92,826	56,799	149,625	169,679
A. Housing	176	16,772	16,948	30,073	2,552	32,625	49,573
B. Environmental Sanitation				21,354	51,316	72,670	72,670
Waterworks					51,316	51,316	51,316
Sewage				13,802		13,802	13,802
Unallocated and Other				7,552		7,552	7,552
C. Health Facilities	1,837	3	1,840	11,299		11,299	12,139
Hospitals	1,079		1,079	7,560		7,560	8,639
Others	758	3	761	3,739		3,739	4,500
D. National Parks and Recreation Facilities	75		75	419	2,931	3,350	3,425
E. Others	125	1,066	1,191	29,681		29,681	30,872
IV. General Government	32,726		32,726	57,934		57,934	90,660
A. Public Administration	6,897		6,897	22,970		22,970	29,867
B. Defense	25,829		25,829				25,829
C. Others				34,964		34,964	34,964
TOTAL	154,650	363,222	517,872	618,785	136,374	755,159	1,273,031

government consumption were deflated separately by a materials wholesale price index (with weights based on the 1960 input-output table) and by a government employee wage index. We applied separate weights to these two indexes for each functional expenditure, based on expert advice within EPA and the Ministry of Finance. Government enterprise inventory investment was deflated individually for each functional type. While EPA uses 1960 input-output weights and an aggregate construction index to deflate government fixed investment other than housing, we used separate construction and (where appropriate) machinery price indexes to deflate each functional category. We used the government housing deflator prepared by EPA. Our implicit aggregate government fixed investment deflator is not substantially different from that of EPA.

Our results differ from the EPA totals in one important respect: we attribute considerably more fixed investment to the local government than does EPA (about 60 per cent of total government fixed investment versus about 42 per cent). The difference arises because we attribute investment to the government unit which makes the expenditure, whereas EPA attributes it to the level of initial financing. Since the central government collects about 70 per cent of total government revenues but does only about 50 per cent of the domestic expenditures, large amounts are transferred from the central to local governments through a variety of mechanisms. For government fixed investment alone, the central level does 40–45 per cent, while financing 55–60 per cent.[11] Within each level, considerable funds go from general government to government enterprises.[12]

Turning from methodology somewhat more to substance, we can note several major characteristics of Japanese government postwar expenditures. First, government expenditures increased rapidly over 1952–1963, at a 12.9 per cent annual rate in current prices; government purchases of goods and services increased at a 12.6 per cent annual rate in current prices, and at 7.5 per cent in 1960 constant prices. Thus, in real terms the public sector command over the economy's resources in 1963 was 2.2 times that in 1952.

Second, this rapid growth of government expenditures did not mean that the government share in gross national product increased. Rather, current price GNP grew equally rapidly (at a 12.9 per cent annual rate) so that with the elasticity of government expenditures approximately equal to unity (see Table 3), the government share in GNP remained constant. In real terms, government purchases of goods and services increased at a rate only four-fifths that of the growth of GNP (9.6 per cent) so that the share in GNP actually declined slightly over the period. Given the rapid growth in government real investment and the rising demand for public services, this result is remarkable, and is contrary to the postwar trends in other industrial countries.

Third, government purchases of goods and services have ranged between 17–19 per cent of GNP in both current and constant prices. Transfer payments

11. See Hugh T. Patrick, "The Financing of the Public Sector in Postwar Japan," in L. Klein and K. Ohkawa, eds., *Japan's Long-Term Economic Growth*, forthcoming.

12. The Japan Monopoly Corporation is the only government enterprise that makes substantial transfers to the general government; its high profits on cigarettes are considered a type of excise tax.

and subsidies amounted to another 2–4 percentage points. These ratios are considerably below those of most other industrial nations.[13] They are just about the same as the government share in the mid-1930s; postwar transfer payments are relatively somewhat larger.

That the government share in postwar GNP has been rather modest and even decreasing in real terms is due to the underlying strategy of economic growth over the period. This growth has been founded upon a great, sustained surge of private fixed investment demand which, in being realized, resulted in cumulative increases in capacity, output and further demand. With the exception of minor, brief recessions, public sector demand for resources has been competitive with private demand. The basic government strategy, more implicit than explicit and never well articulated, was to allow private investment first priority in the allocation of resources, and to restrain the provision of government services except where they directly supported private production of goods and services.

This strategy was possible in part because at the beginning of the period there was some unused capacity in infrastructure, and perhaps in certain government services. In part the government simply met the increasing demand for public services—better roads, urban water supply and sewage systems, prevention of air and water pollution, solution to problems of urban housing and congestion—in a rather minimal fashion. Hence a gap between the supplies of private consumption goods and public goods relative to their respective demands has appeared and tended to widen. It is not readily apparent why this lag in public services has been tolerated. Perhaps the postwar reconstruction syndrome, with its justification for personal sacrifices, lasted long. The demand for public consumption goods is not always well articulated in a democratic political system. Or perhaps observers overestimate the extent of demand for public goods; individuals in what has been a relatively low-income country by Western standards may simply prefer private consumption. No doubt the very nature of rapid growth produces such imbalances, since with rapid structural and parametric changes it is not possible to synchronize completely all sectors of the economy. At any rate, within the last several years there has been increasing pressure, and substantial government response, to do more to meet the demands for provision of public services. Nonetheless, even now the debate continues between those who emphasize continued rapid growth based upon private investment and those who want the government to do much more, even at the expense of some growth, to meet the problems of rising public needs.

Fourth, the composition of government expenditures reflects this growth

13. For an illuminating comparison of Japanese government expenditures, in total and by major economic categories, with other industrial countries, see S. Shishido, "The Role of the Government in the Postwar Economic Development of Japan," in Klein and Ohkawa, *op. cit.* Shishido also makes an interesting simulation analysis, using Japan's medium-term model and the West German proportions to GNP of taxes, transfer payments and government consumption expenditures. His results suggest that Japan could have had a significantly higher provision of government services and welfare payments with little adverse effect on the growth rate, balance of payments, or price level. See also Ryutaro Komiya, "The Levels of Capital Formation and Public Finance in Postwar Japan," in National Bureau of Economic Research, *Foreign Tax Policies and Economic Growth*, New York, 1966.

strategy. Transfer payments and subsidies have been less than 20 per cent of government expenditures. Postwar Japan has not had the problem of open unemployment of labor, but rather of wide differentials of labor productivity between agriculture and non-agriculture, among various industries, and particularly by scale of firm within industries. This problem has been handled less by transfer payments, and more by relying upon rapid growth to absorb labor into private sector high productivity occupations. The consumption share of government purchases of goods and services, 65 per cent in 1952 (59 per cent in current prices), declined to 46 per cent by 1963 (49 per cent in current prices). Thus the level of government investment has been high and rising, relative both to government expenditures and to GNP. The government investment-consumption ratio is much higher than in the 1930s; the relative decline in military expenditures from the 1934–36 average of 6.9 per cent of GNP has been almost fully compensated by an increase in government investment.

Functionally, development expenditures have taken the largest share of the government total, increasing from about 40 to 45 per cent of expenditures and from 49 to 55 per cent of goods and services (48 to 56 per cent in real terms). For the major categories the shares are about the same in current and constant prices. Disaster ranged from 5 to 9 per cent, social welfare from 20 to 25 per cent of total expenditures and 12 to 15 per cent of goods and services, and general government from 27 to 32 per cent of expenditures and 25 to 29 per cent of goods and services.

The changing composition of government expenditures, especially between consumption and investment, is seen clearly from the estimates appearing in Table 3 of the elasticities of various economic and functional categories of government expenditure to GNP.[14] Government transfer payments and subsidies have increased at the same rate as GNP, but government current purchases of goods and services have risen much more slowly, especially in real terms (an elasticity of only 0.43). Overall, the Japanese government has been very successful in holding down its current expenditures, and in concentrating increasingly on government investment. The investment elasticity of 1.3 in real terms (1.21 in current prices) seems fairly high; it attests to the success of the government's policy to place high priority on economic growth.

The functional elasticities are even more interesting. I found it somewhat surprising that the government's developmental expenditures had an elasticity of only about one, less in real terms; initially I had anticipated that the government had increasingly favored developmental expenditures. The answer lies in the high elasticity (1.8 in real terms) of government expenditures (mainly investment) on transportation and communications, and the rather low elasticities for all other developmental categories. Japan's telephone network has consistently lagged behind demand, especially in urban areas. Transport bottlenecks appeared first in the boom of late 1956-early 1957. The government has responded by investing vigorously to improve communications and transport,

14. Since the growth rate of GNP was so high, even an elasticity of considerably less than one implies a rather rapid rate of growth of actual expenditures; in real terms an elasticity of 0.5 implies an annual growth rate of expenditure of 4.8 per cent.

TABLE 3

GROWTH RATE OF GOVERNMENT EXPENDITURES AND THEIR ELASTICITY TO GNP, 1952–1963

	Current Prices			Constant Prices[a]		
	Rate of Growth	Elasticity	R^2	Rate of Growth	Elasticity	R^2
Total Expenditures	12.7%	.989 (.039)	.985			
By Economic Category						
Subsidies and Transfers	13.3	1.02 (.055)	.972			
Goods and Services	12.6	.981 (.039)	.984	7.5%	.802 (.059)	.949
Fixed Investment	15.8	1.21 (.059)	.977	12.6	1.30 (.082)	.962
Consumption	10.3	.814 (.034)	.983	4.0	.432 (.043)	.911
By Functional Category						
Developmental	13.9	1.08 (.041)	.986	8.7	.922 (.068)	.948
Agriculture	9.9	.784 (.060)	.946	5.7	.617 (.079)	.858
Mining and Manufacturing	7.2	.577 (.213)	.424	4.1	.428* (.285)	.184
Transport and Communications	20.4	1.53 (.073)	.978	18.1	1.81 (.133)	.949
Power and Water	8.8	.667 (.110)	.785	6.9	.700 (.138)	.720
Education	12.0	.938 (.036)	.986	4.6	.496 (.052)	.893
Other	8.0	.651 (.140)	.684	−2.7	−.276* (.237)	.119
Disaster	8.1	.664 (.157)	.640	5.3	.588 (.144)	.626
Social Welfare	13.8	1.07 (.045)	.983	9.5	.992 (.114)	.885
General Government	11.2	.875 (.034)	.985	5.1	.550 (.050)	.924
General Administration	10.7	.835 (.035)	.983	3.8	.413 (.056)	.842
Defense	14.8	1.13 (.051)	.980	7.2	.776 (.127)	.789

[a] Goods and services.

( ) Standard error of estimate.

NOTE: All estimates except those marked with * are significant at the 5 per cent level.

so that expenditures for them increased in real terms from 49 per cent of developmental investment and 21 per cent of developmental goods and services in 1952 to 66 per cent and 45 per cent respectively by 1963. Electric power expenditures by government grew relatively slowly, since most investment was done privately, though financed substantially by governmental institutions. Water was supplied adequately for industrial purposes, if not for consumption uses.

Perhaps the most startling is the relatively slow growth of real expenditures on education, an elasticity of only 0.496; current price expenditures increased more rapidly due to the substantial raises in teacher salaries. Part of the reason undoubtedly is the stagnation in number of persons of school age. However, given the increase in average years of schooling, and particularly the increase in senior high school and college enrollments, our results suggest the existence of considerable strains in the educational system. Indeed, the results support the criticisms by Professor Ryutaro Komiya and others of the overcrowding of classrooms and other inadequacies of facilities.

Government social welfare expenditures have grown as rapidly as GNP, and at a slightly faster rate than developmental expenditures. Social welfare, as indicated in Table 2, includes housing, water and sewage systems, health services and facilities, the subsidy paid to farmers for rice,[15] and unemployment and related welfare payments. The relatively high elasticity of social welfare expenditures might appear to contradict the earlier argument that provision of these services was given low priority in the allocation of resources. However, the initial base was low—social welfare expenditures were only 5 per cent of GNP in 1952. At that time, the economy had not yet reached prewar levels of per capita output, and the main thrust was to restore productive capacity, with lower priority to the amenities. Moreover, demand, especially in urban areas, for many of these services—water and sewage systems, health services, housing —is probably highly elastic, considerably more than the unitary elasticity of supply. This is not surprising, given Japan's level of per capita income. This certainly is true for urban housing, particularly in the Tokyo-Yokohama and Osaka-Kobe areas into which more than 20 per cent of Japan's population is crowded. And, as the early postwar relative prosperity in agriculture has been swamped by the tremendous increases in industrial productivity and wages, there has been a high elasticity of political demand upon the ruling party to transfer more of the benefits of growth to farmers. This was accomplished in part by raising the controlled price to producers of rice, initially held low to benefit consumers, so that by 1960 the government was incurring deficits, financed by general tax revenues.

The government has been successful in holding down its general administrative costs—for legislature, justice, public security, fire control, foreign relations, etc.—without obvious problems emerging which expenditures would readily solve. Parkinson's Law has not applied over the period.

15. As measured by the deficit in the Foodstuff Control Special Account. The deficit has arisen from a relatively high government purchase price of rice from farmers and a relatively low sales price to consumers.

Japan's defense expenditures between 1952–63 were consistently less than 1 per cent of GNP, in both constant and current prices.[16] The elasticity of defense expenditures was slightly greater than unity in current prices due to increases in personnel costs but in real terms was only 0.776. The small allocation of the economy's resources to defense has clearly been one of the contributory factors to Japan's remarkable growth performance, since resources not so used constituted a portion of the economy's substantially increased share of resources allocated to private and public investment.

Aside from the growth-inducing contribution of government expenditures in postwar Japan, we have been interested in the cyclical impact of government expenditures upon the economy as a whole. The Japanese economy has been subject to rather wide fluctuations over three to four year cycles, with recessions in 1954, 1958, 1962, and 1965. The amplitude of the cycle derives mainly from the very rapid—12–15 per cent—growth rates in boom years, since even in recessions the economy continues to grow at 3–4 per cent annually in real terms.

One method of testing the cyclical relationship of government expenditures to GNP is to compare the deviations from the trends of expenditure growth with the deviations from the trend of GNP growth.[17] This can be done by simple regression analysis, as follows:

$$G_{id} = a_o + a_1 Y_d$$

where G_{id} is the absolute value of the deviation from trend of the i^{th} category of government expenditure, and Y_d is the absolute value of the deviation from trend of GNP. If government expenditures are contra-cyclical in their impact, then a_1 should be negative: the deviations in expenditures should move in the opposite direction from the deviations in GNP.

Results of current price regression estimates are presented in Table 4.[18] There was no significant relationship for one-third of the categories, and for the others the R^2 was not high. Nonetheless, it is impressive that in all cases but one (where the relationship is not significant) the value of a_1 is positive. Government expenditures have reinforced the cycle, rather than mitigating it. Perhaps whatever contra-cyclical impact of government expenditure there may have been was much shorter run, within one or two quarters, so that our test using annual data does not catch it. This would imply an extraordinary flexibility of government expenditures which is not borne out by the nature of

16. Except 1952 and 1954, when they were slightly more than 1 per cent in real terms.

17. This test is far from ideal. It does not formally and explicitly specify a macro model of income determination, including interactions (though a less rigorous formulation and interpretation is provided later in this article). Moreover, the optimal level of aggregate demand relative to actual demand should be the explanatory variable, and deviations from the trend is not a perfect proxy. For example, at the end of a recession it might well be desirable for both GNP and government expenditures to increase more rapidly than at their trend rates; this would imply a positive correlation (though for a brief period in terms of year units). However, other proxies for optimal aggregate demand in Japan—such as unemployment rates, or capacity utilization rates—are even less adequate, largely because of data limitations.

18. Constant price regressions also were estimated, but none of the results was significant at the 5 per cent level. In 11 of the categories, the sign for a_1 was positive, and in only 4 was the sign negative.

TABLE 4

CORRELATION OF DEVIATION IN EXPENDITURES WITH DEVIATION IN GNP, CURRENT PRICES

	a_1	R^2
Total Expenditures	.237	.437
	(.081)	
By Economic Category		
Subsidies and Transfers	.042	.325
	(.019)	
Goods and Services	.194	.431
	(.070)	
Fixed Investment	.095	.364
	(.040)	
Consumption	.104	.425
	(.038)	
By Functional Category		
Developmental	.115	.379
	(.046)	
Agriculture	.015	.355
	(.007)	
Mining and Manufacturing	.001*	.055
	(.005)	
Transport and Communications	.036*	.186
	(.024)	
Power and Water	.003*	.176
	(.002)	
Education	.046	.414
	(.017)	
Other	−.0007*	.008
	(.0026)	
Disaster	.002*	.002
	(.015)	
Social Welfare	.053	.398
	(.021)	
General Government	.051	.359
	(.022)	
General Administration	.046	.353
	(.020)	
Defense	.0027*	.126
	(.0023)	

( ) Standard error of estimate.

NOTE: All estimates except those marked with * are significant at the 5 per cent level.

the budgetary and expenditure process in Japan. These results, namely the pro-cyclical nature of government expenditures *in toto* and by category, do support the interpretation that monetary rather than fiscal policy was the main technique

for attempting to control cyclical fluctuation.[19] The pro-cyclical nature of government expenditures has been a direct effect of the institutional arrangements and rules of thumb of budgetary policy during the period: expenditures were more or less limited to revenues; revenues were highly elastic to growth of GNP; Ministry of Finance officials fairly systematically underestimated the coming year growth of GNP (and hence of revenues), especially in booms; revenue surpluses were to be used to increase following year government expenditures and to decrease tax rates. Inevitably the government increased its expenditures more rapidly as booms progressed, and slowed the rate of expenditures in recessions when revenues lagged.

In conclusion, we hope that our efforts will encourage the Japanese government to prepare detailed functional estimates of government expenditures as defined in the national accounts on a continuing basis. While we prefer the utilization of a development, or growth-inducing, functional category, any of a number of classification systems will do so long as there is sufficient detail. No doubt further improvements can be made in estimation procedures. A major conceptual and measurement problem, as yet unresolved, is the treatment of increased efficiency of factor inputs in the production of government services and hence the appropriate deflators. Our assumption of no increases in labor productivity is surely overly conservative. Much remains to be done in the analysis of the role of the government sector in Japan's postwar growth.

19. See Hugh T. Patrick, "Cyclical Instability and Fiscal-Monetary Policy in Postwar Japan," in W. W. Lockwood, ed., *The State and Economic Enterprise in Japan*, Princeton: Princeton University Press, 1965. Of course this test relates only to expenditure policy, while any comprehensive evaluation of fiscal policy must also consider the revenue side and revenue-expenditure balance.