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REDUCING INFANT MORTALITY: INVESTMENT VS. FOOD SUBSIDY

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Introduction

Rice has been basic to the civilization that prevailed in the past and continues to be so in the present and even in the foreseeable future. Wheat flour too, has become an important food item, since the second world war, almost a staple item for the urban middle and the poor classes.

The main focus of this study is on the government expenditure on the food subsidy and its impact on infant mortality. Rice has been the staple food and it was rationed and subsidised with the other food items. Details of the rationing and subsidisation of other food items are too numerous to discuss, and hence are dropped owing to limitation of space. What is presented here is the total expenditure on food subsidy covering the government subsidy on all food items.

The poor who form the majority, consisting more than fifty percent of the population, do not have sufficient resources to purchase sufficient quantities of the staple. Hence, some type of subsidy is desirable. Availability of rice to poor families would contribute to the improvement of the mother's health, which is a vital factor that determines the health of the infant. When rice is provided free or at a subsidised price, in addition to the direct nutritional effect it brings, it also increases the real income and thereby allows mothers to consume more nutritious food. Consequently, further improvement in nutritional status of the mother could be expected.

Historical Evolution

Rice rationing and subsidisation of its price in Sri Lanka has a long history, dating back to the Second World War. The Food Commissioner's Department was established in 1942, to manage food rationing. According to the Food Commissioner (1949), subsidisation of food to consumers began in 1943, with rice as the first commodity to be subsidised.

The main reason for the rationing of rice was the disruptions to sea traffic and the destruction of paddy fields in Burma, the main supplier of rice to Ceylon, by the hostilities during the Second World War. As Kelegama (1951), pointed out these destructions, resulted in scarcities in rice in the country and this led to the rationing of the limited available quantity among consumers equitably.

The rationing started with a subsidised price for a fixed quantity of 1 1/4 measures (2 1/2 lbs), per head, per week, with an extra measure to manual workers. This scheme

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suggests that even at that time the government was conscious of the importance of food consumption of the manual workers who exert more energy in their normal work. This ration and the subsidy have been changed from time to time by successive governments, sometimes on the advice of international lending organisations.

However, owing to various reasons, both political and economic, this rationing and subsidisation was continued, despite strong criticism by the economists, both foreign and local, for example Karunatilake (1975). Their arguments were based on the superiority of investment on physical capital over consumption or human capital formation for economic development. When food is subsidised, the argument of the traditional theory of development goes, resources are redistributed to consumption, whereas, the need of the day is to increase physical capital accumulation for economic development. Only a minor consideration has been given to the productivity improvements that result from increased consumption (Wickramasinghe 1978).

Karunatilake (1975), however, did not oppose the provision of sufficient food to the under-privileged. His criticism was on the method adopted. His argument was based on the traditional 'trickle down' formula. He argued that development would ensure higher purchasing power to the people, hence once the country is developed, people could acquire sufficient food and that is a lasting solution to the problem. In other words, economic development is a more reliable and permanent solution and subsidy to the under-privileged is not only costly, both in financial terms and distortions, but also the effects are only temporary.

However, he failed to show the mechanism which would ensure automatic 'trickling down' of the increased income made possible by economic growth. On the other hand, empirical evidence shows that economic growth on its own cannot ensure a fair share to the disadvantaged groups unless specific attempts are made aiming at such an objective. It is also not clear whether he has equated economic growth with economic development, as most of the economists did during this period, as development means also redistribution of increased income to the poor. Among the available alternatives, one of the more effective direct method of redistributing income is food subsidy. There is a limitation as well. Subsidisation means charging more than one price for the same commodity in the market. This might permit trade in that commodity: recipients of subsidised food might resell them at a price which is lower than the free market price. However, there is a blessing in disguise in that too. The increased income could also be spent on other food items which are more nutritious.

Objectives of Food Subsidy

The main reason for the continuation of the food subsidy scheme. according to Kelegama (1951), was the increasing cost of living. The government attempted at mitigating the rising cost of living problem initially by providing a dearness allowance to the workers. However, it was felt that alone was incapable of solving this problem. The middle class agitation, in particular that of the left oriented Government

Clerical Services Union (GCSU), for a higher dearness allowance made the government search for new avenues. This took the form of increased subsidisation of the price of the two staple food items, rice and flour.

In the first few years of independence, (1948-1952), the food subsidy was not a severe burden to the government as there was sufficient foreign exchange and government revenue resulting from Sterling Balance and surpluses from the "Korean Boom", to import and meet the subsidy budget. However, the government made a profit on the sale of both flour and sugar. From 1959 to 1969, a substantial portion of the rice subsidy, often as much as 50%, was met out of profits made from the sale of flour and sugar and to some extent maldive fish. In 1972 the price of sugar increased in the world market. Since then, the profits on sugar had declined considerably.

Objective

The main objective of this paper is to examine the impact of welfare measures, in particular the food subsidy, on infant mortality in Sri Lanka. An attempt is also made to compare the differences in efficacy of the food subsidy and the per capita income increases, in reducing infant mortality. In other words, what is attempted here is an estimation of the indirect effects of the food subsidy and a comparison of the relative efficacy in the reduction of infant mortality through increased investment on physical capital and increased welfare expenditure. For this purpose a regression analysis is done by using data in Sri Lanka over two and a half decades, on infant mortality, per capita income and food subsidy, and public expenditure on health.

Cost of Food Subsidy

Cost of the food subsidy, i.e. social, financial and economic, are too numerous to be examined here. What is attempted here is to pinpoint some of the main cost items of food subsidy and examine their magnitude. Three main cost items of food subsidy can be distinguished:

(a) domestic financial cost
(b) balance of payments effect, and
(c) implications for production incentives

Budget Deficit

Table 1 shows food subsidy in relation to total government current expenditure and budget deficit in Sri Lanka and also percentage of budget deficit and food subsidy on current expenditure. Initially the government's financial commitment to food subsidy was relatively small, around 10% of the current expenditure and a third of the budget deficit. However, from the late fifties the food subsidy increased as a percentage of the government current expenditure and was between 12 - 19% until 1972. 1973 recorded the highest percentage, ie a quarter of the recurrent expenditure and thereafter it remained virtually at 20% until 1979, despite the drastic policy change to contain subsidy

expenditure brought in 1977. This trend was reversed in 1980 and thereafter the percentage remained a single digit.

Budget deficit as a percentage of the current expenditure showed a diversity. The lowest was 4.5% in 1954 and the highest in the pre-reform era was 64% in 1976. This showed an increasing trend. Ironically the lowest percentage during the post reform period was 68% in 1978. This rose to 125.5%, in 1982, the highest for the entire period examined. During that year the expenditure on food subsidy was only 10% of the current expenditure. Hence, it is obvious that other factors than the food subsidy, were responsible for the budget deficit.

The expenditure on food subsidy per se is not unproductive. (Wickramasinghe 1978) The expenditure on food subsidy may be recouped through the nutritional effect. However, the nutritional effect is compounded owing to, at least two factors: possibility of trading in the subsidised food and availability of food to groups whose nutritional effect is very marginal or non existent.

Balance of Payments

Food subsidy affects the balance of payments at least in two ways. Firstly, when the price of the subsidised food is considerably lower than the free market price, the demand for food increases faster than normal. This would lead to the increase in total imports as Sri Lanka imports food. Secondly, the food subsidy increases real income of the recipient, which in turn increases imports depending upon the value of the marginal propensity to import.

Table 2 shows food imports, balance of payments, terms of trade and external assets of Sri Lanka. Total food imports have increased tenfold over the last twenty five years. Balance of trade has recorded an ever expanding deficit. Terms of trade had had an uneven trend until 1965. Thereafter it continued to decline. The first crisis from the food subsidy arose in 1952. The effects of the "Korean Boom" had declined and the food subsidy had to be met by drawing foreign assets. In 1951 the total external assets were Rs.1216.8 m and in 1952 it fell to Rs. 947.3m, a drop of about 6% within one year. In another three years, a secular decline in external assets could be seen. In this context the government could not absorb the increases in price of the imported rice. Price increases of the imported rice was passed on to the consumer. This resulted in a chain of civil and political disturbances, including a "Hartal". The second crisis arose in 1966 with the fall of external assets to rather low levels.

However, as in the case of the budget deficit, reduction of the food subsidy has had no effect on the position of both balance of trade and external assets.

Table 1: Government total current expenditure, expenditure on food subsidy, budget deficit and ratio of food subsidy on budget deficit.

Year	(1) Total Current Expenditure	(2)/(1)	(2) Expenditure on Food Subsidy	(3) Budget Deficit	(3)/(1)
	Rs million				
1951	841	0.270	239.3	- 255	0.303
1952	728	0.180	124.8	+ 11	0.015
1953	710	0.026	18.6	+ 83	0.117
1954	891	0.040	35.9	- 40	0.045
1955	1110	0.067	74.7	- 228	0.205
1956	1055	0.100	105.0	- 249	0.236
1957	1280	0.087	111.2	- 446	0.348
1958	1367	0.106	144.4	- 509	0.372
1959	1485	0.129	192.3	- 501	0.337
1960	1513	0.164	247.5	- 439	0.290
1961	1520	0.151	230.2	- 579	0.381
1962	1738	0.130	225.3	- 520	0.299
1963	1896	0.191	362.5	- 682	0.360
1964	2020	0.136	273.8	- 723	0.358
1965	2129	0.133	283.2	- 850	0.399
1966	2363	0.086	202.1	- 947	0.401
1967	2668	0.110	294.2	- 1150	0.431
1968	3032	0.113	343.2	- 1320	0.435
1969	3174	0.104	331.6	- 1707	0.538
1970	4263	0.126	537.3	- 1414	0.331
1971	3877	0.186	722.6	- 1982	0.511
1972	3990	0.169	676.0	- 1366	0.342
1973	3799	0.256	947.4	- 1425	0.375
1974	4565	0.105	952.1	- 1599	0.350
1975	5265	0.234	1230.4	- 2699	0.513
1976	5602	0.167	937.6	- 3576	0.638
1977	6533	0.218	1424.1	- 3074	0.471
1978	10521	0.205	2162.7	- 7164	0.681
1979	11588	0.200	2326.0	- 8791	0.759
1980	13249	-	304.6	- 16274	1.223
1981	17721	-		- 14866	0.839
1982	16005	0.103	1652.0	- 20091	1.255
1983	20110	0.079	1586.0	- 21606	1.074
1984	23963	0.066	1578.0	- 15861	0.662
1985	28926	0.052	1514.0	- 25676	0.888
1986	33842	0. 045	1549.0	- 28071	0.829
1987	34777	0.048	1666.0	- 27342	0.786
1988	38816	0.049	1895.0	- 43241	1.114
1989	46613	0.093	4325.0	- 43995	0.944

Source: Central Bank of Sri Lanka.

Table 2: Food imports, balance of trade, terms of trade and external assets in Sri Lanka

Year	Food Imports	Balance of Trade	Terms of Trade	External Assets
1951	-	-	-	1216.8
1952	-	-	-	873.8
1953	796.4	- 138	86	640.4
1954	664.0	+ 340	103	944.3
1955	na	+ 415	112	1228.8
1956	na	+ 196	104	1275.7
1957	607.0	- 95	94	1061.9
1958	677.0	- 80	100	933.2
1959	811.6	- 183	102	734.0
1960	752.0	- 203	102	541.3
1961	672.0	- 62	94	531.7
1962	630.0	- 143	98	503.9
1963	629.0	- 180	89	462.3
1964	1008.0	- 200	86	351.0
1965	604.0	- 13	88	439.9
1966	956.0	- 344	86	367.6
1967	783.0	- 335	80	448.9
1968	na	- 380	68	463.0
1969	976.0	- 746	64	377.1
1970	1069.0	- 315	61	402.6
1971	919.0	- 287	57	498.1
1972	961.0	- 255	55	726.7
1973	1309.0	- 299	47	851.2
1974	1950.0	- 1263	42	888.8
1975	2520.0	- 1421	34	833.9
1976	1431.0	- 709	45	1402.2
1977	2131.0	- 350	59	5573.6
1978	4127.0	- 2393	58	7477.0
1979	4807.0	- 7288	42	9652.3
1980	6134.0	- 16140	34	6766.2

Source: Central Bank of Ceylon

Implications for Production Incentives

One of the major indirect costs of food subsidy is the disincentives it creates to the local producers. For instance, according to the Central Bank cost of production of paddy in 1973 was Rs. 11 per bushel and the GPS price did not generate an attractive profit margin to the producers. However, data does not substantiate such an argument. GPS price in that year was Rs.18 per bushel. That means there was a gross profit margin of Rs.7, which works out to be 64% of the cost of production. The GPS price, CIF value

and the CIF/FEEC prices per bushel of paddy are presented in Table 3. Over a substantial period, ie. in less than half the period examined the GPS price of paddy was more than the CIF/FEEC price of a bushel of paddy. Only in three years was the CIF price less than the GPS price.

The inadequacy of the profit margin may be due to other distortions in the economy of which inflation could be one. Partial or total withdrawal of food subsidy would exacerbate the existing situation. The best undistorted price of tradeable goods is their border price (Little & Mirrlees 1978). As the GPS price was above the cif price in all but three years, the question of disincentives is unfounded.

Table 3: Price of a bushel of rice - G.P.S. and C.I.F./FEEC

Year	G.P.S Price Rs	C.I.F	C.I.F with 60% FEEC
1951	9.00	11.53	18.45
1952	12.00	11.59	18.55
1953	12.00	11.29	18.07
1954	12.00	9.69	15.51
1955	12.00	8.24	13.18
1956	12.00	7.68	12.29
1957	12.00	6.99	11.19
1958	12.00	7.06	11.29
1959	12.00	6.94	11.09
1960	12.00	6.78	10.84
1961	12.00	6.53	10.61
1962	12.00	6.96	11.14
1963	12.00	7.22	11.55
1964	12.00	7.53	12.05
1965	12.00	7.85	12.67
1966	12.00	9.92	15.10
1967	14.00	9.44	23.63
1968	14.00	14.77	19.11
1969	14.00	11.94	15.81
1970	14.00	9.98	13.27
1971	14.00	8.29	12.82
1972	14.00	8.01	23.68
1973	18.00	14.80	66.17
1974	30.00} 33.00}	41.36	
1975	33.00	28.13	45.00
1976	33.00	15.83	25.00
1977	33.00} 40.00}	16.25	26.00
1978	40.00	29.38	47.00
1979	40.00	32.50	52.00
1980	50.00	34.38	55.00

The Model

Infant mortality reduction not only arrests the destruction of would be valuable assets but also contributes towards reduction in population. A renowned nutritionist Allen Berg (1973) said "an important precondition for bringing down birth rate may be to keep more children alive...". The lag between infant mortality and birth rate was estimated to be 20 years in Puerto Rico (1930-1950) and Chile (1901-1911), 15 years in Sweden (1873-77 to 1888-92) and 10 years in the United Kingdom (1901-1911). According to the United Nations this lag in Sri Lanka was 13 years (1946-1959). Other studies, for instance Tylor (1970), Poffenberger (1967), Tylor and Hall (1967), show that parents do prefer to have one or two adult sons in the family as a result of superstitious beliefs as well as for economic reasons. If the infant mortality rate is high parents produce a larger number of male children in order to retain at least that number in their families.

Infant mortality depends on a number of factors among which per capita income, distribution of income, expenditure on government health services, literacy rate and expenditure on government food subsidy are some of the important ones. In this study an attempt is made to build a model that shows the relationship between each of these variables with infant mortality. However, distribution of income, and literacy rate were dropped. Distribution of income data are rather discontinuous and cannot be used in a regression analysis. On the other hand, literacy rate is an estimated figure and errors involved in estimation of that may contribute to enhance the bias associated with the estimation of the model.

Definition of variables

X_6 = log infant mortality figures per thousand live births

X_1 = log per capita income

X_{22} = log two periods lagged Gross Domestic Capital Formation

X_3 = log government current expenditure on health

X_{31o} = lagged government expenditure on health

X_4 = log current expenditure on Government food subsidy

X_{41} = log (log X4)

Simultaneous Equation Model

As the values of these variables are determined simultaneously, a simultaneous equation model is more appropriate.

$$\text{Infant Mortality} = A + \beta_{11}\ (\text{per Capita Income}) + \beta_{12}\ (\text{two period lagged investment}) + \beta_{13}\ (\text{lagged govt. expenditure on health}) + \beta_{14}\ (\text{log Expe. on Food Subsidy})$$

Per Capita income $= b + \beta_{21}$ (two period lagged investment)

Govt. exp. on hea. $= c + \beta_{31}$ (per capita income)
or,

$$X_6 = A + \beta_{11} X_1 + \beta_{12} x_{22} + \beta_{13} x_{310} + \beta_{14} x_{41}$$

$$X_1 = b + \beta_{21} X_{22}$$

$$x_3 = c + \beta_{31} X_1$$

$$sX_6/sX_1 = \beta_{11}$$

$$x_6/sx_{22} = \beta_{12}$$

$$sX_6/sx3_{1o} = \beta_{13}$$

$$sX_6/sX4_1 = \beta. 1/X_4 \; . 1/(\log X_4) \; . X_6$$

Per capita income increase contributes to the fall in infant mortality through the possibility of more and better nutritious food consumption by the expectant and lactant mothers. However, the distribution of income is a more important factor which could determine the availability of nutritious food. Greater the skewness of the distribution of income higher the percentage of population who are deprived of basic needs. A high percentage of the income of the poor are for food consumption. Hence, the per capita income has a negative relationship with infant mortality.

The relationship between infant mortality and per the capita income is assumed to be of constant elasticity. Higher the values of per capita income, smaller the absolute value of the change in infant mortality rate.

Public expenditure on health and medical services too has a direct negative relationship with infant mortality. The hospital and medical staff increases as well as expansion of preventive health services contribute towards keeping both mother and infant healthy and safe. Rich people have resources to purchase these services from the private sector. The rich normally do not patronise the government health services, and it is the poor who mostly make use of the public health services in Sri Lanka. As the rich can afford to purchase nutritious food and also patronise private sector health and medical services, infant mortality cannot be a serious problem among them. On the other hand, among the rich educational level is relatively higher and that too contributes to low infant mortality. However, government expenditure on health is treated as an endogenous variable. But government expenditure on health is treated as an exogenous variable as its coefficient is not significant.

Table 4: Incomes, investment, expenditure on food subsidy and health and infant mortality in Sri Lanka.

obs	Income	Invet	Health	Food	Mortal
1	754.0000	815.0000	89.00000	318.0000	78.00000
2	712.0000	627.0000	93.00000	154.0000	71.00000
3	712.0000	558.0000	117.0000	16.00000	72.00000
4	696.0000	664.0000	118.0000	44.00000	71.00000
5	753.0000	974.0000	112.0000	97.00000	67.00000
6	715.0000	1048.000	122.0000	123.0000	68.00000
7	720.0000	1139.000	140.0000	147.0000	64.00000
8	708.0000	1156.000	148.0000	193.0000	58.00000
9	863.0000	1348.000	148.0000	296.0000	57.00000
10	855.0000	1380.000	166.0000	280.0000	52.00000
11	877.0000	1455.000	174.0000	277.0000	53.00000
12	877.0000	1359.000	176.0000	439.0000	56.00000
13	908.0000	1523.000	178.0000	330.0000	57.00000
14	912.0000	1347.000	181.0000	341.0000	53.00000
15	931.0000	1685.000	182.0000	245.0000	54.00000
16	952.0000	1859.000	194.0000	349.0000	48.00000
17	1005.000	2063.000	214.0000	369.0000	50.00000
18	1028.000	2630.000	203.0000	343.0000	53.00000
19	1055.000	2359.000	214.0000	539.0000	48.00000
20	1032.000	2496.000	230.0000	698.0000	45.00000
21	1028.000	2254.000	233.0000	627.0000	46.00000
22	1072.000	2285.000	231.0000	749.0000	46.00000
23	1097.000	2263.000	203.0000	595.0000	51.00000
24	1110.000	2509.000	210.0000	720.0000	45.00000
25	1126.000	2529.000	199.0000	515.0000	44.00000
26	1157.000	2334.000	352.0000	659.0000	42.00000
27	1225.000	3663.000	218.0000	931.0000	37.00000
28	1276.000	4923.000	254.0000	865.0000	38.00000
29	1332.000	6556.000	274.0000	890.0000	34.00000
30	1380.000	6076.000	271.0000	520.0000	30.00000
31	1431.000	7052.000	243.0000	431.0000	31.00000
32	1489.000	7566.000	281.0000	328.0000	28.00000
33	1538.000	7013.000	359.0000	276.0000	27.00000
34	1630.000	6718.000	312.0000	263.0000	24.00000
35	1666.000	6958.000	341.0000	254.0000	23.00000
36	1640.000	6963.000	343.0000	253.0000	24.00000
37	1678.000	6756.000	458.0000	534.0000	19.00000

Table 5: Investment, food subsidy and infant mortality

Number of observations 26 (4-29)
Dependent variable X6
Instrument list c x1 x3 x6

C	= 7.979	(16.075)	R^{-2}	= 0.886
X_{22}	= -0.245	(-2.876)	Wd	= 1.859
X_{41}	= -1.247	(-5.095)		
Ar(1)*	= 0.633	(6.666)		

sx_6/sx_{22} = -0.245
$s.x_6/sx_4$ = -0.545

( ) t values

* Auto regressive - one period lagged dependent variable.

Both per capita income and public expenditure on health contribute to reduce the infant mortality rate through other variables. For example, changes in per capita income influence infant mortality through changes in consumption . The public expenditure on health too influences infant mortality through the availability of medical personnel and infrastructural facilities, both on curable and preventive medicine.

However, the expenditure on food subsidy affects infant mortality in a more direct manner. Changes in expenditure of food subsidy directly condition the food availability to the most vulnerable sector, the poor. Hence, the food subsidy factor has a direct and almost instantaneous effect. The effect of food subsidy on infant mortality is rather peculiar. The elasticity here is diminishing rather than constant as in the case of the earlier variable. This is due to two reasons:

(a) In the case of food the impact of consumption increases on health and nutrition is peculiar in that when the food intake is very low the impact is very strong. However, as the consumption continues to increase the effect falls rapidly and after sometime it increases at a decreasing rate.

(b) As the infant mortality rate falls, the quantity of food that is required to bring the infant mortality rate down further becomes progressively larger.

Other factors, such as per capita income too, may behave this way, but the magnitude of their values which is required to reach the region of diminishing elasticity is so high that it is not relevant to this problem. When a country reaches that region it would no longer be a developing country.

In order to show this relationship the food subsidy values were converted to log twice and included in the model.

Food subsidy is treated as an exogenous factor in this model as its value is determined by factors such as population, balance of political power and availability of foreign exchange for import of food. Of course, per capita income too could influence the determination of the magnitude of the food subsidy. However, in this respect political factors have been more powerful than the changes in per capita income. During the initial period the magnitude of the food subsidy bill was increasing faster than that of per capita income.

Results

Earlier Iseman (1980) has estimated the relationship between economic growth (per capita income) and literacy rate, life expectancy at birth and infant mortality in Sri Lanka by using average values for developing countries. The results were spectacular; all the values of those indicators were substantially higher than the averages corresponding to Sri Lanka's per capita income. However, the methodology followed in this study is different. Instead of taking averages for the developing countries in this study time series data for more than a quarter century is used to estimate the relative efficacy of investment in physical capital and human capital.

Results of the application of two stage least squares to the model is presented in Table 4. This model shows a very good fit, R2 = 0.886. As the Wd statistics is very close to 2, 1.859, it is unlikely that autocorrelation is a major problem. The negative sign of the coefficient tallies with the theoretical foundation, as when both investment and food subsidy increase infant mortality should fall. Both these coefficients are significant as the t values are high. β_{12} = -0.245 and β_{14} = -1.247. β_{12} is the investment elasticity of infant mortality. However, β_{14} is not the food subsidy elasticity of infant mortality as the x_{41} is twice logged value of food subsidy. Its value has to be adjusted to obtain the elasticity between these two variables. Once the necessary adjustments are made the food subsidy elasticity of infant mortality sX_6/sX_4, becomes 0.5449. This shows that food subsidy is 2.2 times more efficient in bringing down infant mortality than investment.

Concluding Note

Welfare expenditure of the government is normally considered as consumption expenditure and an end in itself. However, recent research has shown that welfare expenditure in developing countries contribute strongly towards improving labour productivity and the values of socio-economic indicators. In this study the relative efficacy of lowering infant mortality by investment in physical and human capital formations (food subsidy) has been examined and it has been found that the efficacy of the food subsidy is more than twice that of investment in lowering infant mortality in Sri Lanka. Reduction in infant mortality not only protects valuable assets but also contributes strongly to the reduction of population growth through reduction of birth rates. Reduction of infant mortality has positive external effects.

This study implies that there is no justification for the general belief that food subsidy is a relatively inefficient method of resource allocation to achieve desirable

economic goals. A more rational way of allocation of resources is to base the resource allocation on comparison of marginal productivities of physical capital and human capital at a given time. The relative positions may change with the economic development of a country.

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