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Division for Public Economics and Public Administration

TRENDS AND ISSUES IN THE ANALYSIS OF PUBLIC EXPENDITURES



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Notes

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Foreword

One of the most important policy issues of the 1990s has been the size and composition of public sector spending. Countries at all levels of development – developed, developing and economies in transition – have struggled with containing public sector outlays and finding the most appropriate means of organizing public sector activities. In response to these efforts, the Division for Public Economics and Public Administration of the United Nations Department of Economic and Social Affairs has structured a portion of its work programme to investigate the empirical and conceptual issues involved in the economics of the public sector. As part of that work programme, the Division assembled a group of experts to meet and present analyses of key aspects of public sector activities and expenditures. The papers reproduced in this volume were presented and discussed at that meeting.

It is, of course, not possible to cover all aspects of public sector economic activities for all types of countries in a single meeting. The topics selected are considered to be of particular importance for a wide variety of countries. Many countries are dealing with ageing populations and the reform of pension systems. Similarly, the importance of human capital to economic development has been emphasised by recent theoretical and empirical research on the determinants of economic growth. Thus, many countries are confronting the reform of their education systems as a means of improving their growth prospect. In both areas, a critical issue is the appropriate balance between public and private activities. This issue provides a primary focus to the papers on pensions and education.

Countries also engage in physical capital accumulation. Public investment, especially in physical infrastructure, is also seen as a contributor to economic growth. For developing countries, the results of the study on public investment indicate that the efficiency of the use of public capital may be as important a contributor to development as the quantity of physical capital employed. Another issue of importance has been military expenditures. While the motives for military

expenditures are complex and largely of a non-economic nature, spending on the military has economic consequences. Global military expenditures declined substantially with the end of the Cold War, but the experience in many developing countries was varied. The paper on military spending in Latin America and the Caribbean emphasises the importance of devoting analysis to the military as an economic phenomenon.

The final two contributions to this volume present analyses of broad issues in the analysis of public expenditures and in the reform of expenditure management. There are many bumps in the road towards achieving greater efficiency in organizing and managing public sector spending programmes and these contributions highlight some of these issues.

The contributions to the expert group meeting represent the views of the respective authors, who have given of their time and ideas in their personal capacities as experts. They do not necessarily represent the views of the United Nations. But they do represent ideas that need to be highlighted in ongoing discussions of these issues. The United Nations would like to thank these experts for their efforts. As the Division for Public Economics and Public Administration continues its work, additional expert opinions and research results will be brought forward, in the hopes of stimulating further fruitful discussions of these issues.

This manuscript was edited by Mr. David Gold, with the assistance of Mr. Larry Willmore, of the Division for Public Economic and Public Administration of United Nations Department of Economic and Social Affairs. The separate papers were presented and discussed at an Expert Group Meeting on Patterns and Trends in Public Expenditures on 8 to 10 June 1999, at United Nations headquarters in New York. The meeting was organized by Messrs. David Gold and Larry Willmore, under the supervision of Mr. Albrecht Horn, Deputy Director of the Division. Mr. Stephan Lock prepared the Executive Summary.

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EXECUTIVE SUMMARY

This report contains six papers presented at a United Nations Ad Hoc Expert Group Meeting on "Patterns and Trends in Public Expenditures", held at United Nations headquarters in New York on 8 - 10 June 1999. The first paper focuses on public versus private provision of pensions. Pensions can be provided by three different systems of finance, often described as "pillars". The first pillar provides a minimum income for all elderly citizens, based on transfer payments and independent of individual contributions. Under pillar two, the pension system receives mandatory contributions from the working population and promises the largest benefits to those who contribute the most. The third pillar is based on voluntary contributions, as a supplement to or a substitute for the other two pension systems. In many countries, a combination or coexistence of these three pillars can be found, and, indeed, a mixed approach is advocated by advisory organizations like the World Bank. While the first and the third pillar are not controversial, the paper states that there is dispute about whether governments may force their citizens into mandatory savings with defined benefit. Various criticisms and reform suggestions, especially regarding the second pillar of pension provision, are discussed. The focal points are the privatization of public pension schemes, a switch from defined benefit to defined contribution, and a shift from pay-as-you-go to full funding. In addition, several risks that can affect retirement income are discussed: political risks, low investment returns, increasing life expectancy, and inflation. The paper also discusses problems of redistribution within pension systems. While private savings (as in pillar three) are not subject to redistribution, the paper argues that redistribution, if politically desirable, is best met in pillar one, which is based on government transfers. The conclusion is that the decision whether to adopt a public or a private system of pensions for the second pillar depends less on economic considerations but on the definition of the role of the State in society.

The second contribution to this volume explores the question of the respective merits and justifications for public versus private education in developing countries. The paper starts with a discussion of general arguments in favor of or against the private provision of education. The latter is sometimes justified by a growing need to restrain public expenditure, in order to reduce budget deficits and external debts, or by general doubts about state intervention in the production of goods and

services. Arguments against the private provision of education are often based on a perceived threat to the political goals of equity and social justice. The paper describes examples of private education companies, mostly in the sectors of vocational training or secondary education, in Brazil, India, and South Africa, and examines the economic success of these companies. The paper identifies several key factors, mainly the provision of a recognized brand name, expansive policy, quality controls, innovative research and development, and the development of new funding mechanisms and student grants. Different forms of state intervention in the field of education are discussed: regulation, provision, and funding, and their impacts. Using England in the 19th century, the paper presents develops a historical argument against the justification of state intervention in schooling for the sake of equality or social justice. As regards education for democracy, if seen as desirable on political grounds, it is argued that the only state intervention required would be funding for those who would be otherwise too poor to attend schools. A direct provision of education through the state does not seem necessary. It is concluded that governments are unlikely to satisfy an increasing demand for education in developing countries, given public expenditure constraints. The paper suggests that many reservations of public policy-makers against the private provision of education are unfounded. From an economic perspective, targeted funding for education, in terms of the provision of a safety net and some state regulation regarding the curriculum on democracy may also be justifiable. The argument about equality of opportunity also suggests state funding for persons in need, given that an education market can provide high quality through competition. The information problem of parents regarding the school choice for their children can be solved through competing education companies and their marketing activities.

The third contribution focuses, from a macro-economic perspective, on the influence of public capital on economic growth in developing countries. First, the static effects of public capital on private sector production, costs and profits as well as the dynamic effects on economic growth are surveyed. Based on this, an econometric model presenting new estimates of the separate and combined effects of three dimensions of the provision of public capital (as regards quantity, quality, and financing) is developed. The paper

concludes that for this sample of 46 developing countries, a positive influence of public investment on economic growth can be traced. The rate of public and private investment, restrained use of public debt, and efficient public budget operations as well as low population growth and education are positively associated with economic growth. The countries with the lowest economic growth often maintained a dismal rate of private investment and failed to operate their public capital in an efficient way.

The paper on "Defense Expenditures in Latin America and the Caribbean" represents an increasing economic research activity in Latin America with regard to questions of the appropriate level of defense expenditure, its opportunity costs, and the cost-effectiveness of providing defense as a public good. The paper gives an overview of overall military expenditure worldwide and in the region, discusses defense as a public good, and tries to assess the economic impacts of military expenditure. The paper concludes that the current state of the art in the analysis of public expenditures is not yet sufficiently reflected in the management and evaluation of military spending. It suggests further research especially for the identification of relevant indicators for the assessment of military spending. The paper concludes that relevant indicators and systematic expenditure analysis should be included in the policy cycle from the very beginning, like in other fields of public expenditure.

The paper on "Public Social Expenditure Analysis" gives a broad overview regarding methodology and applications of expenditure analysis. The latter, based on a macroeconomic framework, covers intersectoral and intrasectoral allocations to maximize social welfare. Therefore, so the argument in the paper goes, it has to focus on the level and composition of public expenditures, their impact on specific outcomes, the distribution of benefits and the options for targeting. Additionally, the analysis must consider needs of government interventions, the relation between the public and the private sector, and agreed social objectives. The level and composition of spending must be measured, and expenditure-outcome combinations have to be assessed with regard to

possible benefit distributions and options for better targeting. Improved targeting of public expenditure benefits has to be related to political economy considerations. These targeting options combined with universal provision should determine the relative impact on benefit distribution. Targeting in different social sectors must be considered on the basis of the desire to improve benefit distribution of public spending in favour of low-income groups. The distribution has related to the associated costs for administering targeted programmes which depend on the correct identification of the target group, the benefit distribution objectives, and the form of targeting itself. The paper concludes that it is important to improve applied methodologies and to collect adequate data steadily to achieve maximum welfare with the given amount of public funds, and to improve public policies based on that impact.

The last contribution, on "New Methods of Public Expenditure Controls", states that in many developing and transitional economies, free-market reforms and privatization programs have been marred by "crony capitalism" and nepotism, neglecting social justice, stability of national currency, competitive markets, and the establishment of democratic institutions and practices. The paper stresses the importance of measures for the utilization of resources in the most efficient and productive way. Various possibilities are discussed as to how to strengthen government capacity in the areas of enhanced resource mobilization from domestic and private foreign investment sources, government financial management (public expenditure planning, budgeting, performance evaluation and accountability), and public enterprise reform and private sector development. The paper defines three key objectives of good public expenditure management: good fiscal discipline, allocation of resources consistent with policy priorities, and good operational management. It concludes that fiscal discipline requires sufficient control at the aggregate level. Strategic resource allocation is only possible on the grounds of sufficient planning capacity, and good operational management is subject to organizational reform within the ministerial administration.

PUBLIC VERSUS PRIVATE PROVISION OF PENSIONS

By Larry Willmore*

The three pillars of a pension system

For some years now, the World Bank (1994) has advocated a mixed approach to the problem of old age security, recommending pension systems that rest on three distinct pillars. The first pillar is noncontributory; it guarantees a minimum income to all elderly in society with the aim of alleviating poverty. Pillar 2 receives mandatory contributions from all workers, and promises the largest benefits to those who contribute the most. Pillar 3 is also contributory, but voluntary, for those who would like to supplement the retirement income provided by the first two pillars.

Pillars 1 and 3, for the most part, are not controversial. The consensus is that the redistributive pillar 1 is best left to government, which is in a good position to finance flat, indexed pensions on a pay-as-you-go basis from general revenue. There is also consensus that pillar 3 is best administered by private institutions, with public involvement limited to regulation of financial institutions.

Pillar 2 in contrast is very controversial. An extreme liberal might argue that there is no justification at all for such a pillar, that government has no business mandating savings to insure that retirees have incomes that place them well above the poverty level. With the exception of Milton Friedman (1999), few economists defend this position¹, at least not in print, so debate has centred on the form government intervention might take rather than on whether government intervention is justified in the first instance. Analysts almost always assume that, unless they are forced to save, workers will consume too much of their income during their working years, save too little for retirement, and live to regret it.

A recent survey by the Organization for Economic Cooperation and Development (OECD) (1998, pp. 56-59) of seven European countries plus Japan challenges this assumption. The OECD compares the income of households where the head is aged 67 with the income of households where the head is aged 55. There is surprisingly little variation in this ratio across countries for income from all sources (earnings, capital, pensions and public transfers). In each country the total

income of people aged 67 is about 80% of the total income of people aged 55. But there is large variation in the ratio of public transfers received by 67 year-olds to total income of 55 year-olds, ranging from less than 30% in Italy and the United Kingdom to 70% in Sweden. Most people in the countries studied are retired by age 67 whereas most are still working at age 55, so the study concludes that "households in many OECD countries set targets for income just after retirement that are about 80 per cent of income just before retiring." (pp. 56-57) Faced with a reduced public pension, "people simply make other arrangements such as increasing private pension contributions, saving more or working longer." (pp. 58-59)

The OECD research findings are provocative, and no doubt will stimulate further research, but the strong conclusion that public pensions completely displace private pensions is not warranted. The fact is that most of those surveyed have little choice regarding contributions to private pension funds; this is required as a condition for 'opting out' of public pension systems. Moreover, voluntary contributions to pension funds are affected by tax incentives, so differences in taxation of pension savings should be controlled in any attempt to measure the effect of public pensions on private saving. Governments that provide smaller public pensions may offer greater incentives for contributions to private pensions. Finally, private pensions are rarely indexed so, unlike public pensions, they tend to erode in value over time. It would be interesting to repeat the OECD study for older cohorts, say age 72, 77 and 82 in addition to 67. My suspicion is that the ratio of retirement income to pre-retirement income falls as the age of the retiree increases, and that it falls faster the weaker the public pension system.

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Reform of the second pillar

Much of the debate surrounding reform of the second pillar is couched in ideological terms, with privatizers favouring anything that reduces the role of the State and defenders of public pensions emphasizing social 'solidarity' and the transfer of income from one social group to another. In this paper, following Bodie (1990) I look instead at pensions from the view of the individual contributor. I evaluate the forced saving of pillar 2 in terms of its contribution to income security in retirement rather than its contribution to any particular social agenda. After all, the contributions to this pillar are related to income, as are the pensions, so participants who are relatively poor while working will continue to be relatively poor while retired.

In most developed economies, and in many developing economies as well, pillar 2 today is a public, defined-benefit plan financed on a pay-as-you-go basis from payroll taxes. A defined-benefit pension is one in which benefits are based on the number of years of contributions and an average of lifetime earnings or, more commonly, an average of the retiree's last few years of earnings. This is in contrast to a defined - contribution scheme, in which each participant receives, upon retirement, a benefit equal to the sum of his or her contributions plus investment return. Pay-as-you-go strictly means the absence of any fund: contributions from today's workers finance the pensions of today's retirees. In practice, there is often partial funding when contributions exceed benefits, or the plan may yield deficits that are financed from general tax revenue.

The traditional design of pillar 2 has come under attack from numerous reformers, including the World Bank (1994). These reformers want more than privatisation of public pension schemes; they call for a switch from defined benefit to defined contribution and from pay-as-you-go to full funding. In fact, many feel that privatisation of pillar 2 in itself, with no other changes, would not be very useful.

Nonetheless, other reforms of pillar 2 are possible. Any of three basic pension systems could conceivably replace the traditional defined-benefit, pay-as-you-go scheme, as can be easily seen with the aid of a 2x2 diagram:

	Unfunded	Funded
Defined benefit	Traditional pay-as-you-go	Traditional occupational or employer plan
Defined contribution	National accounts	World Bank (1994)

The traditional pillar 2 is unfunded/defined benefit. The World Bank promotes a shift to funded/defined contribution, but two other reforms are possible: funded/defined benefit and unfunded/defined contribution.

Employers and trade unions have traditionally favoured defined-benefit plans, and have funded these private plans in accordance with actuarial projections of future investment income and future retirement needs. Projections are uncertain, so there is always a risk that a fund may prove inadequate to finance promised benefits, but this risk is borne largely by the employer or trade union rather than individual workers. For participants, defined-benefit plans are appealing because they promise benefits that do not vary with fluctuations in financial markets.

Unfunded, defined-contribution plans are less common, but Sweden has recently begun to move toward such a system, based on notional accounts. In the Swedish system, each worker has an individual account that is credited with his or her contributions plus interest, and converted, on the eve of retirement, into an indexed annuity. But the system remains pay-as-you-go, for current revenue is used to pay current pensions. Italy and Latvia are implementing similar reforms.

A shift to defined contribution is intended to strengthen the link between contributions and benefits. In a typical defined-benefit plan, whether private or public, funded or not, returns on contributions differ from participant to participant within the same cohort. Income is re-distributed, for example, from workers with a flat earnings profile to those with a steep profile (the result of rapid promotion), and from dual-income to single-income families, the result of 'free' benefits for a dependent spouse. Any desired redistribution may be retained in a defined-contribution system. The new Swedish system, for example, continues to credit workers for years of university, years of child care and years of unemployment, but general government revenues finance these credits so that the retirement income of other workers is not affected.

A shift to funding is more difficult to justify than a shift to defined contribution, at least for public pensions. Private pensions are almost always funded, for two reasons. First, private companies can go bankrupt, so a separate fund can protect pensioners from other creditors in this event. Second, there are often tax advantages for funding. Indeed, tax incentives frequently cause firms to overfund pensions. But governments do not pay taxes and governments do not

go bankrupt, so these are not arguments for funding public pensions (Hemming 1998).

Funding benefits society as a whole only if national saving increases, permitting the economy to grow, making it easier to support retirees in the future. Those on both sides of the funding debate now recognize that full funding in itself will not necessarily increase national saving. Estelle James, lead economist for the World Bank's 1994 study, states this with exceptional clarity in a recent article:

“When a country with an existing pay-as-you-go system replaces it with a multipillar system, national saving increases if benefits are cut or taxes are increased. [P]utting part of the contribution into the worker's own mandatory saving account may be more politically acceptable and less economically distortionary than increasing saving through high taxes that go into the general treasury” (James 1998, p. 289).

In short, national saving increases because of fiscal austerity and not because pensions are funded. Pension reform encourages saving only to the extent that this facilitates fiscal austerity.²

Without privatisation, the funded, defined-contribution system is a provident fund, and this is not the model that reformers have in mind! Reformers are adamant that individual accounts must be privately managed. Why? Essentially because they do not believe that the public sector will competently invest workers' savings. To quote E. James (1998, p. 276) once again: "publicly managed pension reserves typically earn low, even negative, returns, largely because public managers are required to invest in government securities or loans to failing state enterprises"

This argument, though appealing, should not be pushed too far. Both public and private pension systems require good government and good management to be successful. If the public sector cannot competently run a pension scheme, it will most likely also fail to

regulate and supervise private pensions in a competent manner (Vittas, 1993, p. 2).

The risks that affect retirement income

Workers who contribute to any pension scheme, be it public or private, expect in return to receive an income in retirement. This expected income is subject to a number of risks, which can be classified as follows (Bodie 1990):

- Adverse political change -- the possibility that the rules of the game will change in such a way that income in retirement turns out to be much less than was promised;
- Poor investment returns -- the possibility that retirement income will be inadequate because of low return on contributions;
- Volatile investment returns -- the possibility that retirement income, while adequate on average, will be very low for extended periods of time;
- Longevity -- the risk that the retiree will outlive his or her savings; and
- Inflation -- the risk that inflation will erode the purchasing power of a pension.

No pension scheme can eliminate all of these risks, and there are difficult trade-offs involved. Higher returns on contributions normally come at the expense of greater volatility, for example. And protection of the purchasing power of a pension comes at the expense of income, at least in the early years of retirement.

These five types of risk take as given the total amount of forced savings. But there also exists the risk that a worker might cease contributions to a pension scheme. Workers who die have no need for retirement income, but he or she may have dependants who were counting on continued support. This risk can be covered with life, disability and unemployment insurance, so is conceptually quite different from the other types of risk listed above. Nonetheless, public pension schemes typically include survivors' benefits (a form of life insurance), disability pensions, and credits for years of unemployment or low earnings.

Markets for life insurance in general perform well, at least for provision of lump-sum benefits to survivors, and a minimum income in old age is guaranteed by the first pillar of the pension system. Rather than provide life insurance, the State may thus choose to mandate the purchase of a minimum amount of insurance, much as

is done in the case of liability insurance for drivers of automobiles. But it is difficult to imagine any entity other than the State providing comprehensive disability and unemployment insurance. If a decision is made to privatise pensions, care must be taken to assure that workers continue to be covered by life, disability and unemployment insurance.

Political risk

Private, individual accounts score high marks for political risk, but privatisation does not eliminate all political risk. Governments have been known to default on bonds included in the assets of pension funds, they enact legislation that affects the value of corporate stocks and bonds, they impose taxes on pension funds, and they regulate funds in ways that are not always in the best interests of the investor.

Pay-as-you-go systems are riskiest politically, however, because current workers support today's retirees with the understanding that these efforts will be repaid by tomorrow's workers. There is no way for today's workers to bargain and contract effectively with unborn generations, so there is always a fear that tomorrow's workers might revolt. The fear becomes more credible when the ratio of retirees to workers rises, either because of demographic changes or because workers are allowed to retire with attractive pensions at younger and younger ages.

A political risk for participants in any defined benefit system, public or private, is that the rules of the game will change so as to increase the returns on contributions for one group of workers at the expense of another group. This can easily happen when there is no rule that all contributors to pillar 2 ought to earn the same rate of return. Note that this rule does not mean that the rate of replacement of earnings of workers with low incomes must be the same as those with high incomes. Workers with low incomes generally live shorter lives, so, as compensations, pensions must replace a larger proportion of their income in order to equalize rates of return. A worker's entire history of contributions must be taken into account as well, for basing the pension on only the last few years' income means that those who enjoyed promotions (who are generally more wealthy) enjoy a higher return on their contributions.

The forced savings of pillar 2 also finance a profusion of 'free' benefits for participants. Credits are given to workers for years of unemployment, military service,

higher education, or rearing of children. This increases the size of the pension, hence the return on contributions, for recipients of such credits, at the expense of other participants. Single-income couples often receive higher pensions relative to contributions than dual income couples or single workers. Also, not everyone has dependents, so provision of 'free' survivor benefits also redistributes wealth away from dual income couples and workers who choose not to marry.

It is important to emphasize that, although these benefits are free for those who receive them, it is contributions to pillar 2 that pay for them. In effect, benefits unrelated to individual contributions are financed with regressive payroll taxes. Governments may have good reason to provide income, over and above the basic pension of pillar 1, to elderly residents who have had little or no attachment to the formal labour market. But do they also want to finance programmes of this nature by taking away a larger portion of the income of a poor person than of a wealthy individual?

Investment returns

Proponents of privatisation argue that participants in pension schemes will earn a significantly higher return if their contributions are invested in stock markets rather than transferred to current retirees. Equity investments in the United States are said to yield 9% a year after inflation, compared to the 1.5-2% returns expected on average for current contributors to public pensions in that country (Feldstein, 1997; Geanakoplos et al, 1998). This frequently cited 9% real return on equity is an average for the past seven decades, however, and it has been extremely volatile, with a standard deviation of 20%. (See table 1). This means that in any given year, there is one chance in three that returns are as high as 29% or as low as negative 11%. In addition, there is considerable serial correlation in the returns, which means that good years are bunched with good, and bad years with bad. This is not desirable for someone who depends on a pension as a sole or primary source of income.

Moreover, the United States is a very successful capitalist system, so a century of high returns on equity in that market is no guarantee that investors will enjoy high returns in other markets, or even in the United States market in the future. Goetzmann and Jorion (1997) provide convincing evidence that the United States is an exception rather than the rule in terms of investment returns. They compare United States stock market indices with those of 38 other countries which have histories of stock prices dating back to the 1920s.

Table 1. United States. Real (inflation-adjusted) returns on equity and government bonds, 1926-1996

Asset	Mean	Standard Deviation
S&P 500	9.4	20.4
Long-term bond	2.4	10.5
Intermediate-term bond	2.3	7.1
Short-term Treasury bill	0.7	4.2

Source: John Geanakoplos, Olivia S. Mitchell and Stephen P. Zeldes, "Would a privatized social security system really pay a higher rate of return?" Wharton School of the University of Pennsylvania, Pension Research Council Working Paper 98-6, 3 August 1998, table 2.

Stock prices in the United States have appreciated in real terms at about 5% a year, compared to less than 3% in the United Kingdom and Canada, and a median rate of about 1.5% in other countries. (There is a dearth of information on dividends paid to shareholders, so these calculations are limited to capital gains, thus understate total returns to stock ownership).

Bonds provide savers with a more stable income, at the cost of a lower rate of return. In the United States, the real return has averaged less than 1% in the case of the safest investment, Treasury bills. (See table 1 once again.) Similar relationships hold everywhere that equity and bond markets coexist. For this reason, financial counsellors generally advise clients first to invest primarily in equity, to gain the advantage of a large, though volatile, return, then to shift gradually to bonds as the date of retirement approaches. Equity is too volatile to provide stable income in retirement years, although it can be a valuable component of an investment portfolio during the accumulation phase.

Participants in a pay-as-you-go pension scheme are savers, even if their contributions are never invested in stocks or bonds, for they sacrifice consumption now in return for a promise of income in the future. Samuelson (1958) and Aaron (1966) demonstrated long ago that the return on contributions in a mature plan of this type is equal to the growth of covered wages, provided that life expectancy does not change. Since life expectancy changes only slowly, and wages tend to be a constant fraction of national income, the Samuelson-Aaron rule implies that the real return on contributions in a mature pay-as-you-go scheme will be approximately equal to the rate of growth of gross domestic product (GDP). Early

participants earn returns much greater than this, as do participants at any time benefits are increased, so the Aaron-Samuelson rule is the minimum return on contributions to a pay-as-you-go scheme provided the rules of the game do not change.

We have seen that 100 per cent equity is too risky a portfolio for a pension fund, at least for one in which there are retirees drawing from it as well as workers accumulating savings. In the real world, prudent managers of unregulated pension funds always invest in a mixture of stocks, bonds and other assets. To facilitate inter-country comparisons, the first column of table 2 reports the real (inflation-adjusted) returns that might have been realized in a number of developed economies in the 1967-1990 period from a portfolio invested one-half in broad holdings of domestic equity and one-half in short-term domestic bonds. The second column shows the expected return on contributions in a mature pay-as-you-go system, proxied by the growth in GDP. Pay-as-you-go often performs surprisingly well in terms of mean return, and is always better in terms of risk. The standard deviation of the portfolio return is in every case much larger than that of GDP growth.³ Past performance, of course, is no guarantee of future results, as mutual funds constantly remind us. But these figures do give some quantitative perspective to the debate.

The argument is often made that privatisation of pensions can encourage the development of capital markets in countries where these are weak or nonexistent. But equity investments in a developing economy are much more volatile and risky than in countries with broad financial markets. For this reason, regulators often restrict investments by

Table 2. Selected developed economies: Returns on private portfolios versus potential returns on unfunded public pension plans, 1967-1990

(means of real total returns in local currency, standard deviations in brackets)

	Private Portfolio1 (%)	Public Pension2 (%)
Australia	2.7 (16.1)	3.6 (1.9)
Belgium	4.2 (16.7)	3.1 (2.2)
Canada	2.2 (11.2)	3.8 (2.3)
Denmark	5.3 (18.9)	2.5 (2.2)
France	5.2 (15.9)	3.3 (1.7)
Germany	6.1 (15.2)	2.8 (2.3)
Ireland	3.8 (13.3)	4.6 (2.2)
Italy	1.9 (18.7)	3.6 (2.5)
Japan	5.5 (15.5)	5.5 (3.2)
Netherlands	4.5 (17.0)	3.4 (2.8)
Sweden	3.8 (13.5)	2.5 (1.7)
United Kingdom	3.8 (14.8)	2.4 (2.3)
United States	2.1 (12.9)	2.6 (2.2)

1. Artificial portfolio composed of 50 per cent domestic equity and 50 per cent domestic bonds.

2. Annual growth in real gross domestic product.

Source: (1) OECD, *Maintaining Prosperity in an Ageing Society* (Paris, OPECD Publications, 1998), table V.2, p. 67, (2) calculated from national sources, annual real GDP growth.

private funds in such economies to government bonds.
In Chile, which embarked on a highly publicised

privatisation experiment in 1981, pension funds at first
invested primarily in government bonds and short-term

money markets, and even now a substantial part of their portfolios consist of Chilean government bonds. In Mexico, also, the recently debt. International investments are proscribed in Mexico and severely limited in Chile, even though diversification through overseas investment is precisely what is needed in small economies to increase returns and reduce risk. Of course, investment in London and New York does nothing to develop local equity markets. But should the forced savings of workers be put at risk in this manner? Or is there a more equitable way to promote financial deepening?

In sum, private funds promise a high return in the accumulation phase, although this requires a portfolio biased toward equities. Investment in equities is riskier than investment in bonds and in most countries entails the purchase of shares on foreign stock exchanges. In addition, it is necessary to subtract from the gross returns the costs of administration, which are everywhere higher for private than for public pension plans, and are particularly high in the case of private individual accounts (Thompson 1999; Murthi, Orszag and Orszag 1999). In The Netherlands, annual administrative expenses for public pensions amount to 1% of contributions, compared to 7% for employer pension plans and 24% for individual accounts (Davis, 1997, footnote 44, p. 29). These are typical private/public cost differences for developed economies, but the gap is much wider in developing countries such as Chile.

Insurance for longevity and inflation

When workers retire and begin to draw on their accumulated savings, they require more than a high and stable return on contributions. They also require insurance against the risk of outliving their savings and protection from the potentially devastating impact of price inflation. Defined-benefit public pensions provide this automatically, whereas individual private accounts do so only if they are first transformed into real annuities.⁴ This is where markets everywhere fail, even in sophisticated financial centres, as the World Bank (1994, pp. 329-331) freely concedes.

An annuity is a series of payments made at regular intervals that continue until a specified event occurs.

When the event is death of the recipient of the payments, this is a lifetime annuity. Other types of annuities are possible, including a two-life annuity where payments continue to a widow or widower following the death of the initial recipient, but these need not concern us at the moment.

An example will be helpful. Consider a hypothetical worker who retires at age 65, with a final salary of 10,000 pesos a year, having accumulated 100,000 pesos in an individual retirement savings account. Prior to retirement, he, or the manager of his fund, shifted his investments out of volatile equity into short-term or indexed bonds. Let us assume that these bonds offer a stable return of 1 per cent a year and, for the moment, that consumer prices are stable. In other words, there is no inflation so nominal returns are equal to real returns.

Our worker belongs to a demographic group of people who expect to live 20 years from age 65. But this is only an average. Some individuals will die before they are 70 while others will live to complete 85, 90, even 100 years of age. Each individual worker faces the risk of longevity, of outliving his or her savings. An individual, acting alone, can reduce this risk only at great cost in terms of a lower standard of living. But the group can pool this risk and provide each individual member with lifetime payments in the amount each would receive with a certain death at age 85. This is known as annuitization of wealth, i.e. the transformation of a sum of money into a series of payments to be made at regular intervals until the death of the person. Our worker's accumulated savings of 100,000 pesos will allow him to purchase a lifetime annuity payable at the beginning of each year in the amount of 5,486 pesos, less any costs of administration. The assets of those in the group who die early provide for the pensions of those with an unusually long life span.

In practice, we observe that few individuals annuitize their wealth, unless they are forced to do so. This is said to be the result of 'adverse selection' in the market for annuities: those who expect to live exceptionally long lives are most attracted to annuities, and insurers are unable to distinguish these 'bad' risks (those with long lives) from the 'good' risks (those with short lives), so have to price annuities in such a way as to make them unattractive to the person with average life expectancy.

Is adverse selection all that important as an explanation for the failure of annuity markets to thrive? It is true

that purchasers of annuities live longer, on average, than those who do not purchase annuities. But purchasers of annuities are also wealthier than the general population, and live longer on this account, so it is not clear whether this observed longevity is the result of adverse selection or simply the fact that annuities are purchased only by those with high incomes. In any event, adverse selection affects life insurance without causing such severe market failure, so it is difficult to see why its effect would be any different for annuities, which are sold by the same firms that sell life insurance. (With life insurance, payments are contingent on death occurring, whereas with annuities payments are contingent on death not occurring).

Quite another problem is 'creaming', which occurs when government regulators do not allow insurers to classify purchasers of private annuities by characteristics other than age for the purpose of charging them different prices. When forced to offer annuities on the same terms to everyone of a given age, insurers attempt to 'cream' the 'good' risks, i.e. those with short life expectancies, such as sky divers, chain smokers and miners. They avoid 'bad' risks, such as women, who live many years longer on average than men. Women and healthy males may find it difficult to purchase annuities. This is market failure, but failure of a different type, caused by rules imposed by government on the industry.

There is another, simple explanation for widespread lack of interest in annuities, and this is myopia. Short sightedness is, after all, the justification for a compulsory second pillar of retirement saving. There is no reason for myopia to disappear the moment a worker retires. Left to their own devices, workers may discount the future heavily, increasing their consumption in early years of retirement at the risk of living with low income in later years. If government provides a means-tested basic pension under the first pillar of the pension system, there is an even greater incentive to increase present consumption, for there is no risk that any elderly person will fall below the poverty floor established by the State.

Myopia might also explain another phenomenon: popularity of nominal over real annuities in those countries without a recent history of high inflation. Even modest inflation causes the real income stream of a nominally fixed annuity to tilt strongly toward the present. To return to the example of a worker with accumulated savings of 100,000 pesos. Assume that

the inflation is steady, fully anticipated, and incorporated into the nominal rate of interest so that the real rate of interest remains constant at 1 per cent. With zero inflation, or with a fully indexed annuity, the purchasing power of the annuity is constant at 5,486 pesos a year. With 4 per cent inflation a year, the nominal payment is 7,665 pesos a year, but its purchasing power falls to 5,385 pesos in the 10th year and to 2,020 pesos in the 35th year. The retiree is clearly better off with a nominal annuity rather than an indexed annuity for the first 10 years of retirement. If he discounts the future heavily, or knows that he will become eligible for a basic pension from the first pillar should his real income fall too low, he will prefer the nominal annuity. Higher rates of inflation tilt the real payment stream even more.

Defined-contribution systems based on 'notional accounts' also require transformation of the accumulated balances of each participant into an annuity stream upon retirement. James Buchanan (1968, p. 394), an early proponent of such a system, recognized the need for protection against inflation, so recommended that participants be offered a variable annuity linked to the rate of growth of GDP. GDP growth is a proxy for return on contributions in a pay-as-you-go system, and, so long as nominal GDP grows faster than consumer prices, will provide increasing purchasing power for any annuity stream. Buchanan recognized that "the variable annuity would be necessarily lower during the years immediately following retirement than the fixed [nominal] annuity," in other words, that the real payment stream would have a positive rather than a negative slope.

Purchasers of annuities face an additional investment risk, and this is the possibility that the market value of their accumulated assets, or the relevant rate of interest that determines the stream of annuity payments, or both, may be unusually low at the time they retire. Mandating the purchase of real annuities resolves any problems of myopia or adverse selection, but it increases this investment risk by reducing options available to retirees. Participants in unfunded, defined-contribution schemes that pay notional interest on savings also face this risk, but it presents less of a problem than in the case of funded accounts, for notional returns are not as variable as market returns on long-term bonds or equity. Participants in defined-benefit schemes, whether funded or not, avoid this risk in essence by accepting an average rate of return that does not vary by year of retirement.

Redistribution in the second pillar?

The first pillar of a pension system is noncontributory and guarantees a basic pension to each disabled or elderly person, so it redistributes income from those who are relatively well-off to the elderly poor. The third pillar encourages savings but does not redistribute of income or wealth. What about the second pillar? Should it redistribute income and wealth?

In developing economies, contributory pension schemes typically cover only a small part of the population; redistribution within pillar 2 misses the poor, who labour in the informal sector, as well as the wealthy, whose income is seldom subject to payroll taxes. In such countries there is no question that the problem of poverty among the elderly poor must be addressed by the first pillar.

Even in countries where pillar 2 covers the entire working population, in my opinion policies to redistribute income and wealth are best left to the first pillar and to progressive taxation. Recall that the second pillar of a pension system amounts to mandatory savings. This is true regardless of whether the pillar is private or public, funded or unfunded. And the working poor are forced to save a higher fraction of their incomes than are wealthier participants. It is only fair, then, that pillar 2 offer each worker a similar return on these savings.

When rates of return vary by worker, the link between contributions and benefits is weakened, and the forced saving of pillar 2 is transformed into a payroll tax, which is very regressive. By regressive, I mean that the rate of taxation is highest for those with the lowest incomes. Typically, all workers, no matter how poor, are forced to contribute to pillar 2 from their very first peso of income. And there is almost always a wage ceiling, above which no contributions are collected. So, even though the rate of contribution is flat, the wealthiest workers -- those with wages above the ceiling-- contribute less as a percentage of their total income. And the very wealthy, who are self-employed, with no income from wages, often contribute nothing at all. It makes no difference whether contributions to pillar 2 are collected from employees or from their employers; the burden of a payroll tax inevitably falls largely on workers (Willmore 1998).

Those who favour redistribution in pillar 2 point out that specific consumption taxes, such as those on tobacco products, are often more regressive than payroll taxes. But the purpose of consumption taxes is to discourage the purchase and use of specific products; the fact that they weigh heavily in the household

budgets of the poor is secondary. Governments have no desire to discourage employment of labour, so payroll taxes, in contrast, are difficult to justify.

In practice, it is difficult to equalise rates of return of participants in a pension plan. Ex post returns, in any event, vary widely. Retirees who live exceptionally long lives receive more pension income than those who die relatively young. But a pension is insurance against longevity, so those who experience longevity are compensated for this event just as purchasers of flood insurance are compensated if they suffer water damage. Those who die young (or their heirs) have no right to demand a refund of contributions, just as those who remain dry have no right to demand a refund of premiums paid for flood insurance.

What matters are the ex ante returns. If the purchaser of flood insurance for a property on a hill pays at the same rate as the purchaser for property in a river valley, then we can say the system is not fair because the insured risk is not the same. Similarly, in a pension scheme, replacement of the same proportion of everyone's covered income is not fair because participants do not have the same life expectancy. There is a well-known positive correlation between wealth and life expectancy (Smith 1999). The very poor, and those employed in hazardous occupations, are less likely even to reach the age of retirement. It is important that their expected return on contributions be at least equal to that of others. This can be accomplished though the provision of generous survivor's benefits and by classifying workers by income and occupation, in order to provide pensions appropriate for each group's expected longevity. In addition, the accumulated contributions, with interest, of participants who die before retirement could be bequeathed to a spouse or children, to augment their old-age pensions. Accumulation can take place in either a real or a 'notional' pension fund.

Under the 'equal return on contributions' rule, a female worker receives a smaller pension than a male of the same age with the same history of wages and contributions. This is due to the fact that women, on average, live longer than men once they reach retirement age. Nonetheless, pension plans rarely treat female workers in this fashion. Even employer-sponsored, defined-contribution pension plans of pillar 3 apply 'unisex' factors to transform accumulated contributions into an annuity. This means that the rate of return on contributions is much higher for women than for men, so pension wealth is transferred from men to women. In other words, a portion of the pension contributions of men are taken to subsidise those of women. Female workers on average earn less than

male workers, so, on balance, this is a progressive rather than a regressive redistribution of wealth. It is one exception to the equality rule that poses no particular problem.

Other departures from the 'equal return on contributions' rule result in regressive rather than progressive redistribution of wealth, so are not so benign. Consider, once again, the common practice of granting a more generous pension to a retiree with a dependent spouse (almost always a woman) compared to that granted to a retiree who is unmarried or has a working spouse, but an otherwise identical history of wages and contributions. This openly unequal treatment of participants is intended to subsidize the traditional family and reward parents (inevitably mothers) for staying at home to care for children. But the subsidy is financed from payroll taxes on workers who, on average, are poorer than the beneficiaries of the policy. And the largest subsidies go to those single-income couples with the largest income.

Society may choose to provide retirement income, over and above a basic pension, to women who seldom participate in the remunerated labour force. But these are noncontributory pensions, which can be handled more transparently and more equitably in pillar 1 than in pillar 2. If desired, the pattern of benefits typical of most current plans could be retained by awarding each housewife a pension proportional to the pillar 2 pension of their husband, and awarding it from the date of retirement of their husband, regardless of the age of the housewife. The only difference would be the financing of this pension, which would come from general government revenue rather than from the forced savings of workers (male and female).

Since the distribution of benefits in pillar 1 is transparent, society may want to use nontraditional rules for award of these noncontributory pensions to housewives. All housewives could be given a larger basic pension compared to men or to women who work outside the home, and receive it from an earlier age. This would result in more redistribution, since noncontributory pensions for housewives would not be related to the contributory pensions earned by their husbands. Another possibility is to reward motherhood and unpaid labour in the home by linking the size of basic pensions for women to family size, irrespective of whether or not a woman works outside as well as within the home. There are many possibilities. The point is that there is no particular reason to link pension payments for housewives to those for their husbands, as is currently the case almost everywhere in pillar 2.

Conclusion

The traditional pay-as-you-go, public system of pensions has the potential to provide workers with excellent security of income in old age. When investment and inflation risk is taken into account, its rate of return on contributions compares favourably with private, individual accounts. The difficulty is that contributors to pay-as-you-go schemes are not treated the same; benefits are not linked closely to contributions, so some participants receive an extremely high return at the expense of others who receive low or negative returns on their contributions.

Privatizers are on solid ground when they argue that poverty alleviation should not be financed with payroll taxes, because these are ultimately paid by employees in the form of reduced take-home pay, even when the employer is legally responsible for paying them. Contributions to a pension scheme represent savings (sacrificed consumption), regardless of whether the funds are invested or not, and workers naturally would like these savings to grow at the highest possible, risk-adjusted return. Privatisation, with individual, funded accounts, promises to accomplish this automatically.

Ultimately, the decision whether to adopt a public or a private system of pensions for the second, non-distributive pillar depends not on economics, but rather on one's view of what role the State ought to have in society. Those who favour privatisation value intangible benefits, such as the increased sense of ownership and responsibility that comes from allowing workers to make some choices regarding the allocation of their forced savings. They also believe that the State has a social agenda, and will use any revenue it receives to further it, so cannot be trusted to provide workers with a fair return on their savings.

Those who favour public provision of pensions point to the higher administrative costs of private pensions, investment risk, and the inability of private markets to provide retirees with affordable, indexed annuities. But they also emphasize social goals, such as redistribution of income from those with high lifetime covered earnings to those with low lifetime covered earnings, or from those with many years of contributions to those with a weak attachment to the remunerated labour force. Their case would be stronger if the social agenda were restricted to pillar 1, which is financed from general taxes paid by wealthy citizens as well as wage earners. If this is not possible, then privatizers have a point: privatisation of the pension system, the creation

of individual, funded accounts, may be necessary to guarantee that all contributors are treated the same. Governments would then be forced to fund social programmes from general revenue rather than rely on payroll taxes that weigh heavily on low-income workers.

Endnotes

¹ Blinder (1988) is not a proponent of this position, but he spells it out very clearly. Davis (1999, p. 2) would replace compulsion with tax incentives in "relatively advanced countries," but not in countries that lack a "savings culture," so he espouses liberalism with limits.

² This point is no longer debated in the literature. Kohl and O'Brien (1998, paragraph 14, p. 12), for example, conclude after an extensive survey that "gains to national saving from pension reform will come only if public saving, defined to include changes in the net deferred liabilities of PAYG [pay-as-you-go] schemes, is increased."

³ The depressed Tokyo stock market of the 1990s is an excellent illustration of the potential implications of this volatility. Average prices of equity shares, as measured by the Nikkei index, doubled between 1987 and the end of 1990, then fell to their 1987 level by 1992. In 1998, shares on the Tokyo exchange were trading at 1985 prices, and bond returns were similarly depressed.

⁴ By real annuity it is meant that the payments increase along with consumer prices so as to preserve their purchasing power.

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PUBLIC VERSUS PRIVATE PROVISION OF EDUCATION

By James Tooley*

Introduction

This paper explores the question of the respective merits and justifications for public versus private education in developing countries in *three* main parts. *First* it examines some recent evidence from the International Finance Corporation (IFC 1998, Tooley 1999) on the 'global education industry'. *Second*, using this evidence where relevant it explores some of the most frequently expressed justifications for state intervention in education. *Third*, in conclusion, it points to some policy proposals which build upon this evidence and discussion.

Background

Concern about the role of the private sector in education in developing countries is motivated by three major concerns:

1. The need to restrain public expenditure, in order to reduce budget deficits and external debts, and the consequent need to find alternative sources of funds for education.
2. Doubts about state intervention in production of goods and services, and the purported benefits of privatisation, applied to the education sector; and
3. The perceived threat to equity and social justice by private education.

First, governments in most developing countries are under considerable pressure, both from within and from external sources, to restrain public spending. Low rates of economic growth, and slow growth in tax revenues, combined with rapid population growth and constantly increasing demand for public services, especially education and health, have led to large budget deficits in many countries (Lewin, 1987). Past borrowing from external sources, to finance development projects in both public and private sectors, has not generated

returns sufficient to cover loan capital and interest payments, leading to high levels of international indebtedness in many countries, particularly in Africa, Latin America, and Southeast Asia. The combination of budget deficits and external debts has in turn led to demands for reductions in public expenditure, most conspicuously as part of the Structural Adjustment Programmes favoured by the IMF and the World Bank. In these circumstances, many countries are looking for alternative sources of funds and mechanisms for the financing of education in order to sustain expansion and improvement without increasing public expenditure. Advocacy of private financing (e.g. World Bank, 1986) and of community financing (e.g. Swartland and Taylor, 1988) has become commonplace, and the search for effective means of cost recovery and for channels of private investment in education, particularly in higher education, has become widespread in developing countries and transition economies (Colclough 1997, Ziderman, and Albrecht 1995).

However, this is not the only reason why interest in an increased role for the private sector in education is being explored. For, *second*, doubts about state involvement in the production of goods and services, and the purported benefits of privatisation, have been extended to discussion of the education sector too. 'Privatisation' programmes have been increasingly adopted by governments world-wide as responses to the perceived inadequacies of publicly controlled and financed industry and services (International Finance Corporation 1995). The question is then raised to what extent the public *education* sector is also subject to such critique: Can private education improve service and opportunity? It is argued by some that, as developed and developing countries alike adapt to the global market economy, 'no education system can hope to foster choice, autonomy, and accountability in society as a whole' – the requirements for the global market economy – without first acquiring these characteristics itself' (World Bank 1996, p. 126).

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In education, more than in any other sector of the economy, except perhaps health, there are, *third*, widespread misgivings about private sector involvement in education. It is argued, in particular, that private educational opportunities exacerbate inequity. In the developed world, there is a huge corpus of academic literature criticising any moves towards 'markets' in education (e.g., Gewirtz *et al* 1995). *A fortiori* these arguments are said to hold against the introduction of private educational opportunities in developing countries (e.g. Tilak 1997).

It is with these concerns in mind that the International Finance Corporation (IFC) – the private finance arm of the World Bank – undertook the study of Investment Opportunities in Private Education in Developing Countries in 1997. One of the key questions it addressed was is it possible to demonstrate in the context of education 'that profit and development can go hand-in-hand'? (IFC 1996, p. 17).

The project team undertook 19 case studies of education projects and 12 country studies. The countries and case studies were chosen on the basis of extensive discussions at the IFC and World Bank. The case studies were selected to cover the full range of primary, secondary, tertiary and distance learning projects. Roughly half of the case studies were of for-profit education companies or schools, the other half not-for-profit foundations.

The global study

Education companies

The first of the key findings of the IFC study of relevance here – for reasons which will become clear in the third section – was the existence of *education companies*. If private education in developing countries was only of the type assumed by many – a few elite private colleges and some scattered 'shack' schools and 'store front' colleges – then perhaps it would not be particularly pertinent to our purposes. However, the existence of education companies provides a 'jolt' in our thinking about education which will be of relevance when we turn to discuss the justifications for state intervention in education. This section gives a brief snapshot of a small number of the companies found (for a fuller report see Tooley 1999, IFC 1998 Part 2) and some of the general lessons learned from them, outlining some of the features which make them completely unlike the private education schools with which we are familiar in Britain and America.

A SNAPSHOT OF THREE EDUCATION COMPANIES

Brazil - UNIP/Objetivo

There are several chains of private schools and universities operating in Brazil. The largest is Objetivo/UNIP, with headquarters in São Paulo. (Objetivo is the school chain, UNIP the university). Objetivo emerged in the early 1960s, when Mr. João Carlos Di Genio started a coaching class for university entrance with about 20 private students. Finding considerable demand for his teaching methods, he founded an intensive cramming course in 1965 with three friends, for students to get into university. They called this course 'Objetivo'. In 1967, they utilised internal television broadcasting for their lessons – a revolutionary development at the time. Three years later they added a school, from primary to 2nd Grade, extended in 1974 to offer courses up to university entrance. In 1988 they were granted the title of University for their upper levels - after what they saw as a 14 year struggle to get such recognition.

Since then, they have continued to expand, so that now they have approximately 500,000 students in centres and 450 franchises across Brazil, with annual turnover approximately US\$ 400 million. School students range from pre-school and primary, through 1st Grade (age 11 - 14 years), 2nd Grade (15-17 years), to prep (university entrance, 18 years). The university offers courses including business administration, teacher training, engineering, dentistry and veterinary science.

India - NIIT

NIIT is the largest provider of computer education and training in India, with a market share of 37%, annual turnover of US\$ 73 million, and profits of US\$ 13 million. The company has more than 500 centres in India, and has recently expanded into overseas markets. It also provides training and software consultancy for companies, and has its own educational multimedia software production facility, with 550 personnel employed making it the largest in the world. With a

history stretching back 18 years, NIIT boasts 500,000 alumni, and a corporate network of over 1,000 companies.

NIIT was conceived in 1979 by Rajendra S. Pawar, now Vice Chairman and Managing Director, then a development officer for a computer company in Bombay. He was aware both of the need for trained computer staff and of the unsatisfactory nature of the computer education in Indian universities. With two colleagues he set up a company, which opened its first Computer Education Centre in a leased room in an office building in down-town Bombay, in 1982. In the same year it opened a second centre in Delhi. Having achieved significant growth, in 1993 the company was listed on the Bombay and Delhi (National) Stock Exchanges. In February 1996, they opened their first education centre outside of India, in Kathmandu, Nepal.

There are now *four* strands to NIIT's business, the most important part being the CEG - the Career Education Group. 60% of NIIT's Education and Training turnover comes from this. The majority - 80% - of students on this course are already 'full-time' students at an Indian university. Many students and employers find Indian university computer courses unsatisfactory, because they use out of date technology and methods, and are undemanding for students. Hence NIIT works 'in tandem' with the formal sector, and offers students a four semester (2 year) course to students already enrolled in a state university. Allowing time for revising for exams for both courses, at the end of three years students can become graduates of an Indian university, and have an NIIT Professional Diploma in Network-Centred Computing. The great majority also go on to the one year NIIT Professional Practice option. This is a one-year placement whereby students are given a mentor in NIIT and a supervisor in the company where they are employed, and paid a stipend for their full-time work. This stipend is calculated to cover *all the fees for the 2-year NIIT course*. This is an extremely successful model, with over 1,000 companies taking part, and in the great majority of cases, students find full-time employment with their placement company. At the end of this process, provided they have satisfied their supervisor and mentor, they become a 'GNIIT', a Graduate of NIIT.

The *second* key part of the education and training business is the ETG - Executive Training Group, which has seven ETCs (Executive Training Centres). These are Authorised Technical Education Centres, in partnership with Microsoft, at which companies can

book courses. There are also about 100 CLCs (Computer Learning Centres), which are set up as turnkey operations for particular companies.

Third, there are the LFC - Leda Family Clubs. Here a family becomes the franchise holder, and uses a room in their own home as the learning centre. These focus on learning through NIIT's brandname software, LEDA - Learning through Exploration, Discovery and Adventure. In this way children (and adults) learn mathematics, English, computing, geography and science through multi-media learning packages. LFCs are also being opened in schools, where the franchise holder contracts to provide all the computer tuition within the school. This is offered at fairly low costs to the school in return for free rental of the premises, which can then be used to generate revenue out of school hours. A key part of the marketing for LEDA is the research which has been conducted by NIIT's research and development (R&D) department, which shows that children who learn through multimedia do better in the classroom at the subjects than those who learn through conventional tuition methods.

Fourth, there is IEG - the International Education Group. There are over 20 countries now, with centres in China, 5 centres in Malaysia, 2 centres in Zimbabwe and three in Indonesia. NIIT has also recently moved into distance learning, with 'NetVarsity', run from a server located in their American concern (because it was too difficult to obtain an Indian connection from the government quango, and also illegal to charge fees), but using all the software developed in India. Initially, this was a free venture, but the first fees are due to be charged from Jan 1998. Finally, NIIT has recently opened centres in the United States of America and United Kingdom, and will shortly be listed on NASDAQ.

South Africa - Educor

The Education Investment Corporation Limited (Educor) is the largest private education group in Africa. It has a combined enrolment of over 300,000 students on 127 campuses, plus large numbers in distance education, and with an estimated 100,000 students graduating in 1997. Its annual turnover that year was approximately US\$ 26 million, with profits of US\$ 6 million. Its education business covers the range from Adult Basic Education and Training (ABET), through primary, secondary and tertiary education, to post-graduate and corporate training.

The Educor group comprises six main education subsidiaries, Damelin Education Group, Midrand Campus, Eden College, The Graduate Institute of Management and Technology, INTEC, the Charter Group, and two recruitment and placement divisions, Renwick Group, and PAG Placements. The oldest of these, and the core on which the fortunes of the company has been built, is Damelin - itself a group of companies, and with its own fascinating history.

Damelin College – a “cramming” college for white students – was founded in 1943 by Dr Benjamin Damelin. Johann Brummer joined as a teacher in 1951, became a partner in 1952, and was until 1998 Executive Chairman of Educor. A key step in the development of the brand name was in 1952, when Johann Brummer started developing distance learning materials, which became Damelin Correspondence College, founded in 1955. Brummer was aware that the majority of African teachers in rural areas had not graduated from high school, and he sought to improve their conditions with a programme of high school graduation through distance learning. He also saw an untapped and potentially lucrative market – showing how the profit motive led to improved opportunities for the most disadvantaged in society.

In the early 1960s, Damelin started offering evening classes from the Johannesburg site - this was the start of the Damelin Campus, which now offers business and degree courses. Next, in 1968, came the Damelin Management School, offering specific training for adults, towards Damelin certificates endorsed by the professional institutes. Finally, in the early 1980s, Damelin Computer School was started, initially only offering part-time courses. All these divisions still operated from the same building in Johannesburg City Centre, on a site leased to the company; eventually, in 1993, the company moved to a purpose built leased site a couple of miles north of the City Centre, in Braamfontein, because the old site in the city centre was becoming unsafe.

In June 1996, Educor was listed on the Johannesburg Stock Exchange, and began further acquisitions. It first acquired Eden College, a competitor, which by this time was running two high schools in the northern suburbs of Johannesburg. Next, it acquired 60% of GIMT - the Graduate Institute of Management and Technology. Looking for further ‘synergy’ with their operations, Educor next acquired the recruitment companies, the Renwick Group - the Chief Executive Officer (CEO) of Renwick, Charles Rowlinson is now the CEO of Educor - PAG Placements, then further distance education

companies. The curriculum offered by Educor now covers all areas from Adult Basic Education and Training (ABET) to MBAs and other graduate degrees. Again, Educor has recently gone on global expansion, acquiring an 80% share of Toronto-based International Business Schools.

KEY FACTORS

Some of the key factors behind the success of these companies, relevant to Section 3, are:

Brand name

The promotion of brand names was significant to all of the educational companies studied. For example, any visitor to South Africa cannot fail to be struck by the ubiquity of advertisements for courses offered by Damelin and other Educor subsidiaries - covering high school, university courses and vocational and professional courses; a visitor to Brazil will soon come across billboard advertising for UNIP-Objetivo, COC or Pitágoras - for the full range from kindergarten to university; In India, the brand name of NIIT is everywhere - on television, radio and in print - advertising computer courses for undergraduates, professional training and, increasingly, computer literacy courses in schools and at home. For companies concerned to promote brand name the following general comments can be made:

- Brand promotion could amount to about 10 per cent of turnover;
- Companies have full-time marketing staff and management to develop and strengthen brand name, who use a variety of methods and promotions;
- Companies can successfully pursue a ‘dual-brand’ strategy; and
- Independent market research shows the brand-name promotion to have been successful for many companies

Expansion

The desire for strong brand names is closely linked with the desire to reach a larger audience. Expansion has been a preoccupation of many of the education companies studied. Some have expanded their

operations through 'horizontal' integration, taking over other schools or companies; others have integrated 'laterally', diversifying into other levels of educational delivery such as TV and radio, or related trades such as recruitment; a few firms have integrated 'vertically', by taking over the educational publishing process, including multimedia development. Surprisingly, most of the companies surveyed had never borrowed to fund this expansion, but had started as 'shoe string' operations, and had financed all their expansion through internal investment. Finally, for many education companies surveyed, franchising was a very important strategy for expansion. In vocational education NIIT franchised computer centres, as did Educor (Damelin); in school education, all the Brazilian chains had franchises - sometimes as many as 450 (Objetivo). Interestingly, Objetivo only franchised at the school, not university level, feeling that quality control would be too tricky at the latter level.

Quality control

In this paper, we are particularly interested in large, growing education companies with strong brand names because of the impact we think this will have on *quality*. What formal mechanisms do these companies have to ensure uniformly high quality across all their centres? The three examples discussed here have the following mechanisms:

NIIT

NIIT, India, exercises tight control over its 400 franchises and 30 branches. Since January 1995, it has implemented CCQMS (Crosby's Complete Quality Management System). Each member of staff undergoes the same initial and in-service training at head office or a regional centre, and all management must also have been NIIT teachers. Each course tutor is given a batch file, which describes in meticulous detail all the courses to be taught, the sub-units, the material to be covered, and the time to be taken on each section - this even prescribes how long must be taken over each overhead transparency! To complement this, each tutor follows a standardised quality control procedure, monitored initially within the branch, then by quality control visits from central or regional management. This procedure uses the following indicators:

- Aggregated mean student marks, as taken on NIIT standardised twice a semester tests (marked by someone other than the faculty). If students are doing badly on these objective tests, this is seen to reflect badly on the faculty member;

- Student feedback questionnaire, completed three times a semester, on which they rate the faculty, the NIIT and their own learning. Importantly,

one of the questions asks for the student's *own grasp* of the knowledge. If the student gives a low assessment here, this reflects badly on *the individual faculty member*;

- Student upgrades. If students are initially only registered for one semester, (as about 50% are), then if they re-register for another course, this is taken as a point in the faculty member's favour; and
- Student defaulters. If students default on payment or drop out of a course, this is taken as a negative indicator of the faculty member.

Educor (Damelin), South Africa

All branches and franchises are subject to identical quality control procedures. They run exactly the same courses, with teachers following identical course materials, using centrally-agreed assignments and assessments, in classrooms laid out to identical minimum specifications, and so on. There are detailed specifications about who can be employed, and all lecturers are evaluated three times a year, using a standardised Lecturer Evaluation Questionnaire, filled out by students. To oversee all these quality control procedures, there is a specialised department, the 'National Support Office', headed by the 'National Director of Studies', and a team of full-time administrators.

Objetivo, Brazil

A key aspect of Objetivo's quality control is based on the course materials. It is prescribed that these are used in exactly the same way throughout the country. All teachers have to finish the same syllabus by the end of each month. If they do not cover all the lessons, then they have to give extra lessons during the month until they do. (Teachers do not see this as restricting their professional autonomy - they see themselves as presenters of material, rather than adjudicators of what that material should be: 'it is part of what it means to be a teacher, to be a performer').

Innovation and research and development

If the education companies are to be able to maintain high quality, and not stagnate and acquiesce in technological obsolescence, then they will need to be engaged in innovation and research and development (R&D). Again, many of the education companies in the IFC study were already doing this.

The most notable example of R&D was found in NIIT – although other companies were not far behind. NIIT has *two* research and development departments. The *first* is a pure research unit, with about 20 people, many with PhDs, employed under Dr Mitra, whose brief is simply to pursue any interesting ideas in education and the cognitive sciences, without any need to look for commercial application. 0.7% of turnover is spent on this pure R&D - i.e. about US\$1 million. Just as in a university department, these academics' performance indicators are simply numbers of publications in learned journals and conference papers.

The *second* R&D department - STRIDE (STrategic Research In Development Education) - is application focused, and employs 40 researchers. It has a generic brief from senior management to look for more efficient ways of teaching, learning and course development: 'if we can teach (or a competitor) can teach this course in an hour, how can we teach it in half an hour?' Or, 'if it takes us one month to develop this course, how can we develop it in half a month?' This uses about 5% of turnover.

In this context it is worth noting how many of the companies are acutely aware of the importance of keeping costs low, by using resources - space, technology and teacher time - efficiently. For example, NIIT goes to extreme lengths to ensure that all resources are used productively from 7 am to 10 pm. A key part of the NIIT philosophy is in the pursuit of teaching innovation and efficiency. Because of the economic imperatives - of shortage of trained teachers, of the expense of teachers, and the shortage of space - NIIT from the very beginning had to be conscious of rationing space and teacher contact time. To this end, they have used their R&D departments to develop teaching methods which reduce contact time and carefully utilise space. They have developed an educational model which utilises three types of room - classroom, mindroom, and machine room - enabling a centre with only 30 computers to accommodate 1,260 students per day.

Student funding mechanisms

Finally, the education companies are of particular importance to the argument being developed later in this paper because they exhibit how concern for the poor and commercial considerations can go hand in hand. Companies have developed student loan schemes, and have established viable mechanisms for cross-

subsidisation of places, to assist the poor in having access to high quality educational opportunities.

Company student loans

Several of the companies had student loan schemes, to enable poor but able students to fund their fees and maintenance. These had the great advantage over government student loan schemes that they were able to capitalise on an 'honour system' which virtually eliminates default and avoids the need for collateral. Students get the loan directly from their school or centre. They feel indebted to the company, and would not wish to cheat it – or a future tranche of students - out of rightful funds. Peer pressure also works to that end. The loan schemes examined are also potentially or actually self-financing, and hence provide a model for a viable commercial possibility in themselves.

Cross-subsidisation

A second way in which the education companies contributed to the education of the disadvantaged included the practice of 'cross subsidisation'. In the Brazilian chains of schools, for example, it is normal practice for there to be a cheaper course offered in an afternoon and/or evening shift. All on the morning course would pay full fees. But the facilities and tuition were avowedly the same in all three shifts, and hence it was apparent that the morning shift was to a certain extent subsidising the later shifts. Another model of cross-subsidy was offered by a chain of public schools, Delhi Public Schools in India with their *Village Schools* in deprived areas. These are run at a loss by the company, using surplus from their Core and Satellite schools. In addition, when upgrading facilities at the Core and Satellite schools, old equipment is passed on to the village schools.

EDUCATION COMPANIES SUMMARY

Around the world in developing countries, educational entrepreneurs have created companies which have strong brand names, are expanding rapidly and have powerful quality control mechanisms in place. The companies are concerned with innovation and research and development, both to ensure economies of scale and efficiency, and to maintain high quality delivery. In each of these ways, we can see that educational opportunities – from primary school through academic and vocational studies to university – can be delivered through companies which behave much as other high performance service industry businesses. They are also concerned to find funding opportunities for the poor.

Demand for education

The second of the key findings of the IFC study – presumably less surprising – was the presence of huge untapped demand for education. In *all* the 12 countries surveyed¹ there was a huge potential market for private education. In many of the countries, there was express dissatisfaction with existing public schools, or inadequate provision in rural areas, and hence potentially untapped markets for education at all levels – primary, secondary, and tertiary (both academic and vocational). There were also extensive waiting lists for some of the private education establishments. For example, Table 1 gives enrolment figures for Latin America, indicating the huge potential demand in areas where there is inadequate provision.

Given this huge demand, the question arises of who will fund any future expansion to cater for this demand. Governments are unlikely to be able to fund this, given the pressures on expenditure already outlined in Section 1 above. It is because of this problem that the debate has re-emerged about whether such demand should be met by the private sector. The question is raised whether moving towards an increased role for private education is desirable. This raises issues concerning the justification for state intervention in education.

Table 1. Enrolment rates for Latin America

Source: IFC 1998

Arguments for state intervention in

made clear that the various forms of intervention are separable and independent: just because government

education

This section addresses the issue of whether private education is justified as a means of catering for educational demand in developing countries by exploring the justifications for state intervention in education.

To set the scene, first we need to be clear what is meant by government intervention in education. It may also be useful to point out what markets in education might look like – as there is a good deal of confusion on this point too.

Governments can intervene in education - as in any other area of welfare - in any of three ways: regulation, provision, and funding (Barr 1993, p. 80).

Governments can regulate the supply side (e.g. aiming to ensure quality through a national curriculum and national testing), as well as demand (e.g. through compulsory schooling). Intervention in provision involves the state itself producing the goods and services (e.g. by building schools and employing teachers). Finally, state intervention in funding can be either 'direct' or 'indirect'. Direct funding involves government subsidy (or taxation) of the price of the good, wholly or in part (e.g. 'free' schooling). Indirect funding comes through income transfers by the state, although these transfers can themselves either be tied to a certain end (e.g. education vouchers) or untied (e.g. general social security benefits).

It is clear that in all current education systems, government intervenes in all three respects, and with direct, rather than indirect funding. However, it must be

intervenes in one respect, does not mean it has to in the others. We can clarify the independence of these factors by looking to other areas of government intervention: the British government is seeking to fund improvements to the London Underground through private finance, while still maintaining it as a public entity (provision separate from funding); United Kingdom regulation compels car drivers to wear seat belts, but there is no state funding or provision of these (regulation separate from funding and provision); finally, social security benefits are primarily to provide food and clothing for families, but there are no state food or clothing stores (funding separate from provision).

If government was not intervening in terms of regulation, provision and funding, what might educational opportunities be like? It is worth noting this question briefly, because much of the discussion on the relative merits of private versus public systems assumes that, if government were to withdraw, much would stay the same as it is now. For example, Brown (1997) in his paper using transaction cost economics, puts forward some arguments against for-profit education, using such considerations as:

'it seems inevitable, based on purely technological considerations, that students will be grouped in classrooms regardless of organizational form, and the similarity between existing public and private schools in using age-grouped classes provides support for this view.' (p. 84).

It only seems inevitable if one is not willing to think rather more radically about what the market in education could offer. Similarly, one of the arguments

for public supply of education focuses on economies of scale that can be obtained in a state system, or on the ability of a state system to fund research and development, which individual private schools could not do. These ignore the possibilities already encountered in section 2 above that in the market, *systems* or *chains* of schools and educational settings will emerge, which are also able to capitalise on benefits of economies of scale, and fund R&D.

The ‘archetypal’ market system of education has been well-described by West (1991, 1997):

‘The usual stylized models of free market provision assume the presence of vigorous competition and the participation of *for-profit enterprises*. ... Consumers who are dissatisfied with one particular supplier have the option of switching their money purchases to others at any time. In this way efficiency is promoted throughout the system so that the invisible hand makes the private interest of suppliers serve the social interest automatically’ (p. 58, emphasis added).

It is very important when thinking through the arguments concerning markets in education, and the relative merits of public and private provision, to realise that West here doesn’t mention schools, but ‘for profit enterprises’. The examples given in Section 2 of for-profit companies are examples of the types of enterprises which he would have had in mind.

Given these comments, let us turn to the three main *normative* arguments for public intervention, in terms of provision, funding and regulation (although these three are not often separated) in education:

- Without state intervention, there will not be education for democracy/social cohesion,
- Without state intervention, there will not be equality of opportunity/equity,
- Without state intervention, there will be an “information problem”.

We will address these in turn, asking whether they are justifications for the state to be involved in education in terms of regulation, funding and/or provision, and how these arguments apply to different levels of education.

Education for democracy/social cohesion

The argument is often given that social cohesion and democracy are externalities which will be under-provided unless there is state intervention in education (Weisbrod, 1962, Krashinsky, 1986). What level of state intervention would be needed to ensure this?

This discussion can be had on various levels. The first is that there are basic minimum requirements for democracy, such as that there should be universal literacy (and probably numeracy), and perhaps some basic understanding of the history, politics and institutions of a country, and that for social cohesion,

similar requirements should also be met. This basic level is the level at which the argument is generally conducted by economists. Philosophers, however, tend to favour a much more elaborate definition of what is required for adequate participation in democracy, and hence for social cohesion, including detailed requirements for particular subject areas and skills in the curriculum (e.g., Guttman 1987).

As regards the first level, the debate on whether state intervention (in terms of funding, provision and/or regulation) is required to ensure universal literacy and numeracy has been examined by looking at historical evidence. The argument here is that the quantity and quality of schooling was almost universal before the state got involved, and that compulsory schooling was not necessary to ensure attendance.

As far as the quantity of schooling is concerned, E.G. West's (1970) argument is that, prior to the major state involvement in education in England & Wales through the 1870 Forster Act, school attendance rates and literacy rates were high, and that state intervention, far from being required to ensure universal attendance and literacy, merely reinforced a process that had been developing for some time. In part his evidence for literacy is based on statistical evidence including records of educational qualifications of criminals, records of workhouse children, workplace literacy returns, and numbers of people signing the marriage register. From these various sources, he concludes that '93 per cent of school leavers were already literate when the 1870 board schools first began to operate' (p. 167). As regards schooling, West uses a variety of widely available statistics, including the report of the Newcastle Commission on Popular Education, published in 1861. Its results showed that 95.5 per cent of children were in school for up to 6 years. The remaining 4.5 per cent, he argues, could be accounted for by sick children, children educated at home, and also perhaps an error in estimation (p. 177). Moreover, on the funding of the educational opportunities, we find that even in the minority of schools in receipt of some state funding, two-thirds of funding came from non-state sources, including parents' contributions to fees, and Church and philanthropic funds (West 1983, p. 427). Even here the *biggest* part of the school fees were provided by parents (p. 427).

Elsewhere I have explored disagreements with West (Tooley 1996) on these issues, and suggested that as far as the quantity of educational opportunities was concerned, most would now concur with the educational reformer and philosopher, John Stuart Mill,

writing in 1834, that 'the education of our people is, or will speedily be, amply provided for.' However, he continues: 'It is the *quality* which so grievously demands the amending hand of government', (quoted in Garforth 1980, p. 114).

However, when evidence for poor quality of schooling is reviewed, I have argued elsewhere (Tooley 1996, pp. 35-40) that it may not after all be that convincing – taking into account all the time, of course, the poverty in Victorian England which means that the quality shouldn't be judged by our standards today. For example, doubts must be cast on the suggestion commonly put forward that government inspection led to higher quality of education: the inspectors' early official concept of educational efficiency meant 'a schooling which scored high marks in divinity and morality', (West 1994, p. 104). Indeed, some schools were deemed worthless precisely because of failure in moral and religious training. But it is likely that many parents felt that these aspects of education were being largely catered for in the family and in the Sunday Schools - 'on week-days families were demanding education in more "practical" matters', (p. 91), such as reading, writing and arithmetic.

Moreover, it must be noted that inspectors making these criticisms are known to have had particular biases. For example, H.S. Tremenheere, in the early 1850s, noted that the people's education enabled them to read 'seditious literature without having the moral or intellectual strength to discern its falseness', (quoted Stephens, 1987, p. 133). This was literature which was 'exaggerating the principle of equality before God and the law', and encouraging workers to be antagonistic towards their employers, (p. 133). With prejudices like these, perhaps we shouldn't be taking these inspector's reports so seriously, but instead be engaged in a critical deconstruction of their motives.

Furthermore, David Mitch has also explored the quality of private schooling in Victorian England by attempting to compare literacy rates in private and public (i.e., state) schools. His first statistical analysis showed that enrolment in private schools improved literacy rates for men and women, whereas enrolment in "public" schools (i.e., with *any*, however small, state subsidy) had a *negative* impact on male literacy, with the effect on female literacy negligible. Controlling for factors which could have affected these results, such as the differing nature of the clientele in each school, Mitch still found private schools had a significant positive impact, against an insignificant impact for public schools (Mitch 1992, pp. 147-149).

Taken with other criticisms and discussion, my suggestion is that the criticisms of poor quality schooling were not as well founded as some might believe. However, it is commonly held that not only did the state need to get involved in the funding of schooling from 1870, but that an essential part of its later intervention was also to make schooling compulsory. Only in this way could adequate educational opportunities be provided for all.

Does the historical evidence support this part of the accepted wisdom? It seems again it does not. First, historians note that there were many reasons which led to *positive* parental attitudes to schooling, and that these were gradually increasing throughout the 19th century. W.B. Stephens – interestingly while trying to show that compulsion was *necessary* – notes in passing that not only were there economic benefits to schooling, but there were also political and social ones. There was the desire to be respectable in the eyes of ‘local clergy and others’ (Stephens 1987, p. 49), as well as the attractions of ‘reading for pleasure and the ability to communicate with relations living at a distance’. Moreover, ‘as schooling *became the norm* the completely unschooled became increasingly untypical, a situation which *must have brought its own pressure to conform*’ (p. 50, my emphasis). We can note how this fits in with the focus group’s discussion in session 1 of the ways in which norms in society can be created which enforce the desire for education. Stephens further argues that ‘From 1840 schooling appears increasingly desirable socially and also functionally advantageous in an increasing number of jobs.’ (p. 51). Moreover, ‘the vast expansion from the 1830s of didactic evangelical and utilitarian publications, of political and commercial literature, and of newspapers, radical and otherwise, attest to a working-class society in which the ability to read must have added to the economic advantages political and social ones.’ (p. 51).

This trend in schooling norms would have a considerable bearing on the need for compulsion. If there were social and political, as well as economic, advantages in sending children to school, and if there were norms that made this more favourable, then it is likely the rate of schooling would continue to increase.

But historians do note that there were negative attitudes of parents that would need state compulsion to overcome. These seem to be of *four* kinds. But *three* of these concern economic factors which may have influenced parental choice about sending children to school – and which were *likely to have disappeared as factors as the wealth of the nation increased*. The first

is the actual fees for schooling, while the second is the *opportunity costs* of sending children to school, that is, the benefits foregone of children’s income and assistance around the house that could be had if children had not gone to school. Both of these are likely to have been quite a considerable deterrent to many poor parents. Thirdly, many poor parents were quite suspicious of the economic benefit to be derived from schooling their children, and so were not prepared to make the necessary sacrifices for no economic return. A common saying amongst the working classes was: ‘The father went down the pit and he made a fortune, his son went to school and lost it’. (Stephens, p. 123). This attitude was reinforced by some employers, who, while promoting schooling ‘admitted that their most skilful and best paid workmen were not necessarily those who were literate.’ (p. 124).

Clearly, as England & Wales grew in wealth, the importance of the first two factors would have rapidly diminished. The third would be influenced by the demands of employment, and as industrialisation increased, the demands of employers for a schooled, skilled workforce likewise increased. A survey in the 1840s found that employers in Nottinghamshire, Derbyshire, Leicestershire and Birmingham unanimously agreed that education led to workers who were ‘more trustworthy, more respectful ... more accessible to reason in disputes over wages or changes in routine, better conducted in their social duties, and more refined in their tastes and use of language.’ (Stephens, p. 136, quoting Parliamentary Papers of 1843). Again there seem to be very strong pressures from industry for educated workers, pressures that would have found their way down to parents and children.

However, there is a fourth factor influencing parental attitudes towards education which *is* of a different, non-economic kind. This was that some working class parents were greedy and lazy and feckless. But all the evidence suggests that these were a very small minority. The majority of the working class in England – as all the foregoing statistics show – were responsible and concerned for their children’s education.

Conclusions and higher-level education for democracy

Where does this historical discussion leave this justification for state intervention in education? For the rather minimal ‘education for democracy’ and social cohesion requirement noted earlier, the evidence suggests that the only state intervention required would be funding of those too poor to send children to schools,

with possible selective compulsion. All other intervention would be unnecessary, given that the great majority of parents would choose to send their children to school in any case, and that the schools attended ensured literacy and numeracy.

With regards to the “higher-level” type of education for democracy discussed earlier, it would seem that, in addition, this would need some government *regulation* of the curriculum. However, even this position may be taking it too far, for to defend it we would need to be committed to the following proposition:

that state intervention in this regard is efficacious; i.e. that certain types of state intervention in education can be expected to have the effect of improving democracy, by effectively promoting the ability of citizens to participate in democracy, better than if the state was not involved.

But without the state being involved there are numerous other ways in which citizens can and do have access to ‘education for democracy’: through lectures, sermons, newspapers, television, films, articles in magazines, pamphlets, comics, books, etc. Indeed, West notes that James Mill ‘contended that a free press was all that was necessary for a healthy and stable democracy’, and that political education ‘could best come from widely dispersed groups airing their views in journals, books and newspapers.’ (West 1994, p. 54). So perhaps government regulation would not be needed.

One objection to settling for these voluntary mechanisms might be that the crucial issue is that *all* should receive a curriculum for democracy, and this cannot be guaranteed without state intervention. However, this assumes a simple correlation between a (state) compulsory curriculum and *all* children ‘receiving’ *all* of the curriculum. But clearly, there are at least five variables which are likely to affect both the percentage of children who receive all of the state compulsory curriculum, and the percentage of the state compulsory curriculum received by each child: the proportion of prescription of the curriculum, the degree to which the prescribed curriculum is actually implemented, the attendance of children, their ability, and their attention and motivation. Hence, it is clear that with a compulsory curriculum, there is a strong likelihood that not all will receive it, and that not all of those who receive it will receive *all* of it.

So the position is that, if education for democracy is thought desirable, it seems we could too easily assume that the state *will* solve the problem and markets and other nonstate provision *cannot*. Finally, on this issue, we can note that some writers

have pointed to the *costs* with regard to social cohesion of state intervention in education. For example, Coulson, after reviewing evidence from the United States of America, France and Germany on the impact that state intervention in education had had on social cohesion, concludes that:

‘Few institutions have caused as much strife and conflict as public schools. They have been used to beat down minorities of every color and creed, setting family against family and community against community. Protestants in both France and the United States used them to attack Catholicism, and Catholics, when they achieved the upper hand in French politics, turned them against Protestantism. United States whites used the public schools to segregate African Americans. Instead of welcoming immigrants in a spirit of mutual respect, government schools often sought to extinguish their cultures and beliefs. Far from promoting social harmony, government schools in the United States undermined it, forcing Catholics to set up their own schools in order to avoid the discrimination they suffered at the hands of the state system, and breeding resentment among many other immigrant groups who felt that their traditions were derided in the public schools.’ (Coulson, 1999, p. 105).

In summary then, the argument from democracy and social cohesion *at most* supports funding for the poor, and possibly some regulation of the curriculum. It is not likely to justify any further intervention in terms of funding or provision or compulsion. There are also questions raised about the efficacy of the regulation in any case – issues which are taken further in the third section.

Equality of opportunity/equity

Weisbrod (1962) and Krashinsky (1986) are amongst those economists arguing that without state intervention in education the externality of equality of opportunity will be under-provided. Assuming the desirability of equality of opportunity, what level of state intervention will be required to ensure it is met?

There are great difficulties with the definition of equality of opportunity, or its sister concept of equity. Nicholas Barr and Julian Le Grand both agree that the concept of equality is ‘elusive’ (Barr 1993, p. 147), unlike the concept of efficiency, which can be defined easily in economic terms. However, after exploring difficulties with defining equality in terms of equal final income, equality of public expenditure on different individuals,

equality in the use or cost of welfare, and equality of outcome, Barr settles for a definition of equality of opportunity, which pertains

‘if the expected value of money income is the same for all individuals with given *T* [taste] characteristics, but must be invariant to their *D* [discrimination - social class, race, sex, parental money income] characteristics.’ (Barr 1993, p. 147).

Meanwhile, Le Grand (1991) settles for a definition of inequity which occurs when ‘individuals receive less than others because of factors *beyond their control*’ (p. 86). So equity is satisfied if ‘informed individuals’ are able to choose over ‘*equal* choice sets (p. 87, emphasis added), where a ‘choice set’ is a set of possibilities bounded by ‘constraints’, and ‘constraints’ are factors beyond individual control.

As far as *educational* implications are concerned, Barr argues that equality of opportunity implies that

“if individuals A and B have similar tastes and ability, they should receive the *same* education, irrespective of factors which are thought to be irrelevant, e.g. income” (emphasis added Barr 1993, p. 337).

Similarly, Le Grand argues, that what is inequitable in terms of education is when ‘children from poor families receive *less* education than those from rich ones’ (Le Grand 1991, p. 86), suggesting again that it is the *same* education which is required.

Several difficulties are raised by these definitions. Firstly, what do they mean by the ‘same’ or ‘equal’ education? This raises a difficult measurement problem. We would need to know two individuals’ ‘full education’ before we could ascertain whether their education was ‘equal’. But, just as there are great difficulties with the measurement of ‘full income’, in part because ‘non-money income’ is largely unmeasurable (Barr 1993, p. 135), so too is there a problem with measuring ‘full education’, in part because ‘non-school education’ is so difficult to measure. Focusing on schooling only has at least the virtue of a possible solution, even if it cuts out a huge swathe of the educational process. But even considering schooling alone raises other problems. What aspects of schooling are required to be ‘equal’?

Clearly, our two economists cannot have in mind that there should be equal schooling *outcomes*, because they recognise that young people have different motivation

levels (Barr 1993, p. 337, Le Grand, 1991 p. 86), and this, interacting with abilities, will be reflected in different outcomes. Perhaps they will have in mind equal educational (schooling) resources? But the ‘same’ resources can lead to vastly different educational outcomes. It is the way resources *are used* which is important, not the resources themselves. For example, suppose that two young people *A* and *B* have similar ‘tastes and ability’ but *B* (who comes from a richer background) is taught in a school which has many more resources than *A*’s school. It might seem that this contrast is objectionable on the grounds of equality or equity. But suppose that the wealthier school uses its resources on expensive older graduate teachers and luxurious surroundings, while *A* is educated less expensively using fewer teachers, networked multimedia systems and community service, say. Would this be objected to on grounds of equality or equity by Barr or Le Grand? Presumably, they would want to know more about the education of *A* and *B* before they could pass any judgement. For the fact of unequal resources alone would tell us nothing about the educational opportunities being offered to the young people.

Perhaps ‘the same’ education means the same *curriculum*, understood broadly to include the ethos and organisation of educational settings? Again, there would be great difficulties, akin to the measurement of full income, which would inhibit the measuring of whether individuals had been offered the same curriculum, even if a compulsory curriculum was imposed by government. (This would include such difficulties as individuals’ different attention spans, reaction to specific teachers, teachers understanding of the curriculum requirements, etc.).

Given these factors, what I am suggesting is that, rather than looking for ‘equal’ or the ‘same’ education, Barr and Le Grand, and others, should rather be seeking to judge whether there are *adequate educational opportunities* for all individuals to develop their talents, which are not dependent upon their family background (see Tooley 1996, ch. 4 for details of this argument).

Given this interpretation of equality of opportunity, what might we say about the role of government in ensuring its provision? In a typical argument, Brighouse argues that ‘the state has an obligation to ensure that, as far as possible, equal educational opportunity is realised in the school system. Practically, this requires that it fund schools for most children out of taxation, and that it regulates schooling to ensure that no child has greater educational advantages because of the family it was

born into or the neighbourhood in which it lives.’ (Brighouse 1998, p. 148).

That is, it is assumed that, only through state intervention in creating ‘comprehensive’ schooling, can we arrive at equality of opportunity. Markets in education will clearly not be able to provide it. There are *three* difficulties with this approach.

The *first* difficulty is that there have been widespread concerns about inequality of opportunity under the kinds of state intervention envisaged. In the United States of America, for example, the seminal studies showing widespread inequality within the state schooling system were Coleman *et al* (1966) and Jencks *et al* (1971). In the United Kingdom, similar inequalities were found by Rutter *et al* (1979), while Smith and Tomlinson (1989) showed that ‘different secondary schools achieve substantially different results with children who are comparable in terms of background and attainment at an earlier time’ (p. 3); Barr (1993, pp. 361-5) usefully summarises the inequity of state education in the United Kingdom. There would seem to be strong theoretical reasons why state intervention will not achieve equality of opportunity, in terms of middle class appropriation of welfare (Goodin and Le Grand, 1987).

Second, this position underestimates the influence families have *outside of* schooling. For suppose that state intervention could somehow make schooling opportunities of rich and poor families alike, would this rule out the influence of the family in the pursuit of the ‘limited goods’ such as ‘top jobs’? Of course not: indeed, the paradox would be that, the more comparable schooling become, the more important would family connections and influence become in the competition for limited goods. For if middle-class families cannot buy into better schools, we can be sure that they would buy into opportunities outside of schools, and use the full weight of their influence to secure networking contacts which will help in the competition for the limited goods. (I have explored this paradox of positionality in more detail in Tooley 1995, pp. 18-21). In other words, as Rawls (1972) points out, if you want to achieve equality of opportunity, then you would need to abolish the family. It is not obvious that trying to equalise provision at which children spend at most 15% of their waking hours will have the desired impact.

Third, why is it assumed that there are no market mechanisms which could also help mitigate parental disadvantage? It is here that the evidence of the emergence of competing private education companies, as noted in Section 2 above, becomes of great importance. For it would seem plausible that such companies could achieve strong brand names which offer high quality educational opportunities for *all who can afford to enter the market*. The assumption of many is that the market in education will produce ‘sink’ schools, in the way that some of the current choice reforms² are arguably doing. The fear is that disadvantaged children will be consigned to these schools, and hence suffer severe inequality of opportunity. But we note that in other consumer goods and services, this is not an issue. There is no such thing as a ‘sink’ laptop computer producer, say, or ‘sink’ supermarket in the way that there are ‘sink’ state schools. Competition and brand names prevents this from occurring.

With competing education companies in an educational market, the whole picture may change. The judgement would have to be made about whether such education companies could better provide quality educational opportunities than a state comprehensive system. Such a judgement would have to take into account the failure of any state system to achieve this end, the theoretical arguments pointing to reasons why, and the ability of brand names in other areas of consumer goods and services to achieve high quality for all who can enter the market.

Where does this leave equality of opportunity as a justification for state intervention in education? The suggestion is that, based in part on the IFC findings of competing education companies, equality of opportunity could be delivered in education in ways analogous to related considerations in other consumer areas. In food and clothing, for example, the fact that there are some too poor and/or irresponsible to feed or clothe their children brings about the desirability of food or clothing vouchers or direct funds for the poor (and perhaps some compulsion or supervision of parents). Crucially, it does not imply that *all* parents must then be compelled to feed or clothe their children, or have free state kitchens or clothes stores funded out of taxation. The parents who are subsidised are able to shop in exactly the same supermarkets as those parents who do not need subsidy. The related equality arguments in these areas imply a safety-net, nothing more. If education is analogous in the ways described,

then it would seem that the equality of opportunity argument is a justification only for targeted funding (and perhaps compulsion) for those too poor (and perhaps too irresponsible) to provide educational opportunities for their children.

Doesn't this depend upon all parents being able to choose sensibly for their children, in terms of the quality of education on offer? This brings us to the third reason for government intervention, the information problem, related to the issue of merit goods.

The information problem

The information problem is one of the principle reasons given by economists – and philosophers – for the need for state intervention in education. For example, Nicholas Barr, of the London School of Economics, argues that the case for public provision of education rests largely on the information problem, (linking it in with the equity issue, as noted above):

private consumption decisions [in education] are likely to be efficient and equitable only if families have sufficient information, and if they use it in the child's best interest. ... Some parents, maybe disproportionately in the higher socioeconomic groups, are capable of more informed decisions than the state; others make poorer decisions. If the quality of parental choice is systematically related to socioeconomic status and the effect is strong, then private allocation can be argued to be less equitable than state allocation, irrespective of the balance of argument about efficiency (p. 349).

Interestingly, because this is a matter for parents as choosers, this is certainly not an argument justifying any state intervention in higher education, although it certainly establishes itself very firmly as a justification for intervention at primary and secondary levels. A similar difficulty is raised by Brown (1997), who points to the 'Inability of students and their families to judge output quantity and quality ... there is a serious problem for parents ... being able to judge the effects of schools on learning' (p. 87).

For Barr this is fundamentally an *empirical* question, of whether 'parents *on average* make better or worse decisions than the state about their children's education?' (p. 349). His reading of the evidence, and his assumption is that the quality of parental decisions will be inversely proportional to their socio-economic

status, and hence that governments will need to intervene in education, to overcome this deficiency.

In what ways should government intervene given this 'information problem'? It would seem that, focusing as it does on the *quality* of what is on offer, that it would certainly necessitate regulation, *inter alia*, of the curriculum and compulsory attendance (Barr 1993, p. 346). As it also has an equity impact, it would seem that it would also require the type of funding noted earlier. But it would not, apparently, require any provision of educational opportunities, provided that there was a suitable regulatory environment.

Clearly, we are used to parents buying goods for their children in other consumer areas, so this objection cannot be primarily the fact that the student 'is not the ultimate customer in terms of paying the bills' (Brown, p. 87), as some seem to assume. It must then rest on two issues: one is concerned with equity, which we have already addressed. The second concerns the *qualitative* difference between decisions on schooling and of any other areas of consumer decision making. This is neatly enunciated by Brown (1997), in his discussion of transaction cost economics. He writes that:

'In buying schooling, parents have little experience and transactions tend to be infrequent. Because each child has his or her own specific abilities, interests and early training, choosing the best educational option is a unique problem. Schooling decisions are usually made annually, for a "school year", and no school year is contracted for more than once for each child. School choices are "lumpy" and fraught with uncertainty. ... There is a sense in which schooling is a once in a lifetime purchase. [Primary and secondary] participation ... is bought only once for each child. And each level of schooling is different from every other. *Education is near the extreme in this aspect of consumption*' (pp. 86-7).

Brown spells out some of the specific problems here: 'While making the mistake of enrolling one's child in a bad school is certainly more consequential than buying a loaf of stale bread, it is probably not on the order of choosing an incompetent surgeon for a serious operation. Mistakes can be overcome through repeating a grade in another school, or employing a private tutor. Yet changing to another school can be inconvenient, costly, and perhaps disruptive to the social life of the student' (p. 87).

However, critics of this position can point out that there are *two* major difficulties with it. *First* is that this assumes that, if education was provided in market conditions, it would exhibit all the same characteristics of the predominantly state sector now. However, this ignores the likelihood that different arrangements may well emerge in a market, sometimes based on emerging technological possibilities, in part precisely to cater for these kinds of difficulties and uncertainties. Again, the evidence outlined in Section 2 above is important, for it illustrates some of the possibilities already emerging in this regard. For example, choices about educational opportunities, unlike choices about schooling, may well *not* be infrequent, and they may well be extremely flexible, easily rectifiable – as easily changeable, for example, as buying a Compact Disc or book.

Secondly, however, it raises the more important conceptual issue of, if not the *parent*, then *who* should decide about the nature and extent of a child's education 'in the child's best interests'? The assumed alternative, of course, is that it is *the state* which will do the collection and collation of information about education and efficiency in education – at all levels, including this (far from exhaustive) list:

- What is education?
- What educational opportunities need to be delivered in schools?
- What should standards be in education?
- How are educational opportunities best delivered?
- How effective is any particular school?

But critics would argue that it would seem very difficult, if not impossible, for the state to obtain this necessary information. The first question is clearly a philosophical question, and answers to it known to be contestable – so what role could the state have in adjudicating between these? Yet the answers to all of the other questions depend upon an answer to this one. Again, the last question is extremely difficult to answer, not only because it brings in the very major measurement problem of what a school is *adding* to the child's achievement, but, more fundamentally, because it again raises the conceptual question of what is to count as 'achievement', and what as 'effectiveness'. Again, such philosophical questions have contestable answers, and it is not clear that the state can viably adjudicate here.

But the information problem doesn't stop there. It might be thought that, say in a democracy, it would be legitimate to impose a particular vision of education and

educational effectiveness on schools. But this assumes that, decision making by government is costless, or to put it a different way, when decisions are moved between different levels of decision making, it is not simply the case that a different set of people now make the decisions, *the nature of the decision itself can change* (Sowell 1980, p.17).

To put this into more concrete form, I have given examples elsewhere from the introduction of the National Curriculum in England and Wales, to illustrate particular problems of, *inter alia*, the unintended consequences of the state intervening to regulate schooling in this way (see Tooley 1996, ch. 5). In particular, these focused on the ease of reversibility of decisions; the possibility of incremental changes; and the ease of fine tuning. All of these difficulties suggested that the most beneficial locus of control over education may not be the state level.

Barr puts the matter in the form of a morally perplexing question:

'if the quality of parental choice varies systematically with socioeconomic status, how do we weigh the relative claims of middle-class children and their parents to be allowed private choice, against those of children in lower socioeconomic groups, whose interests might be served better by the state?' (Barr 1993, p. 349).

Surely, there will be, perhaps only a small minority, of parents who will not be able to make sensible, well-informed decisions about their children's education? And then wouldn't this require government to be involved in regulating their education, and perhaps, for reasons of efficiency or equity, bring in demands for government intervention for all?

However, the discussion thus far suggests an alternative possibility. Again, the evidence from Section 2 of competing companies *with strong brand names* is relevant here. In other areas of consumerism, we rely, largely successfully, on the power of brand names to satisfy consumers, even when there is a large degree of ignorance. I was able to buy my current lap-top computer even though I am ignorant about the internal workings of computer software or hardware. The computer manufacture, however, could not assume that I was ignorant, and had to provide me with as high quality a machine as the most avid reader of computer consumer literature. The viability of the brand-name, and hence the success of the company, depends on nothing less. It would seem that the same principle could apply to the case of education and educational

brand-names. One of the advantages of markets, it is argued, is that not *everyone* need be well informed in order to benefit from them.

Conclusions and policy proposals

There is huge untapped demand for education in developing countries. But governments are unlikely to be able to satisfy this demand, given public expenditure constraints. This leaves open the possibility that the private sector may be able to satisfy this demand. However, there are considerable reservations about this possibility amongst policy-makers, because of the perceived justification for state intervention in education. This paper has suggested that these reservations are unfounded. Three major justifications for state intervention in education were examined in this paper, in the light of recent evidence of the nature and extent of private education in developing countries. For each of the justifications, this recent evidence, together with other considerations, has brought us to the conclusion that the justifications for state intervention may not hold. The argument from education for democracy and social cohesion only suggested some justified *targeted* funding for education, in terms of ensuring a 'safety net', for those whose parents are too poor or too irresponsible to provide educational opportunities for them. It may also, if a stronger version of what was required for democracy was accepted, lead to the desirability of some further regulation of the curriculum. The argument from equality of opportunity suggested similar funding for the poor, provided that the education market delivered high quality through competing brand names. Finally, the information problem raised the difficulty of parents as ignorant choosers of educational opportunities, but found a solution again in the market, without any need for further regulation, in terms of competing education companies.

The conclusion of this paper, then, is that it need not be assumed that government intervention is needed to subsidise those who don't need subsidising, or that government intervention should be allowed to crowd out – through over-regulation and unnecessary supply – the private sector which could otherwise provide vibrant and innovative educational opportunities if permitted to do so.

If these principles are accepted, policy proposals emerge for a 'mixed economy' of public-private

partnership in education. I have discussed a "Modest Proposal" (with apologies to Jonathan Swift) to move towards this end (Tooley, 1999), which has the following elements:

- ❑ Policy-makers and opinion formers need to be informed of the development potential of education companies, and their implications for equity;
- ❑ Investment from international organisations in private education projects, which satisfy conditions of profitability, educational efficacy and social responsibility, should be encouraged;
- ❑ The regulatory environment in countries needs to be modified to ensure that such companies can emerge and prosper, in order to play their full role in equitable development;
- ❑ Links between education companies and institutions and the public sector, similar to the ones found in several countries, should be encouraged, to enable the management expertise, incentive structures and investment potential of the private sector to inform, challenge and potentially 're-engineer' the public sector; and
- ❑ The sources of finance available to allow students – and, in particular, disadvantaged students – to benefit from private educational opportunities should be extended. This could involve at least the following: (a) facilitating the setting up of *company* student loan schemes, perhaps aided by overseas investment. This may be in terms of a global student loan company, channelling funds through education companies, and financed through international investment; and (b) extending voucher schemes and other *per capita* subsidy funding of private education by governments.

This 'modest proposal' hence aims at mechanisms which:

- (a) Extend the range of private educational opportunities offered;
- (b) Liberalise regulatory regimes;
- (c) Bring into public education the perceived management and investment superiority of the private sector, and
- (d) Extend the range of finance available to allow students to enter private education.

Endnotes

Argentina, Brazil, Colombia, Côte D'Ivoire, India, Indonesia, Jordan, Romania, The Russian Federation, South Africa, Thailand and Turkey.

² Importantly, markets in education must *not* be confused with systems of education introduced under 'choice' reforms. For such reforms have taken place within highly regulated, state provided and state funded systems, where the supply side has not been liberated, and parental demand is not expressed through anything resembling a price mechanism – in short, any criticisms of such systems are unlikely to be criticisms of a more authentic market in education (see Tooley, 1996 ch. 3, Tooley, 1997). Evidence concerning some voucher schemes may also come under the same rubric, depending on the degree to which genuine competition and price mechanisms are introduced.

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PUBLIC POLICY AND ECONOMIC GROWTH IN DEVELOPING COUNTRIES: THE ROLE OF PUBLIC CAPITAL

By David Alan Aschauer*

Introduction

Virtually all developing countries invest heavily in their public capital stocks--facilities such as roads and highways, water and water treatment systems, and communications networks. What are the effects of such investments on economic performance and, more specifically, on economic growth? This paper attempts to provide an answer to this question by:

- surveying the literature on the *static* effects of public capital on private sector production, costs, and profits;
- reviewing recent work on the *dynamic* effects of public capital on economic growth; and
- presenting new estimates of the separate and combined effects of three dimensions of the provision of public capital (quantity, quality, and financing) on economic growth.

Static effects of public capital: private sector production, costs, and profits

A large and expanding body of empirical research investigates the static impact of changes in the stock of public capital stock on economic performance. The main focus of this research is to determine the importance of public capital to the private sector's productive capacity, to its costs of production, and to its level of profitability. Accordingly, the bulk of this research can be placed in three categories: the production function approach; the cost function approach; and the profit function approach. A brief summary of these separate lines of research follows.

Production function approach

The production function approach, extensively analyzed by Aschauer (1989a) in a study of the United States economy, revolves around the estimation of

where Y = real output, KG = public capital, K = private capital, and E = employment. Table 1 indicates a wide range of studies which use this approach to appraising the importance of public capital to the economy. In this table, the shaded rows indicate studies which uncover an important role for public capital in production. The vast majority of the studies concentrate on the United States, and the most aggregative of the studies use national time series data. Generally, these studies find statistically significant relationships between public capital and private sector output. Most of the other studies employ data for the 48 contiguous states over the period from 1969 or 1970 to form either a cross section (typically by averaging the data over relatively long time intervals) or a panel data set to estimate production functions. For the most part, these studies still find a statistically important role for public capital in private production, but the quantitative magnitude of the relationship is diminished and often quite sensitive to the particular estimation method (*e.g.*, to estimation by fixed or random effects versus ordinary least squares). A few other studies utilize metropolitan data and find a much smaller, though still statistically significant, role for public capital.

While a clear majority of the studies listed in table 1 detect an important role for public capital in production, various researchers raise a host of statistical concerns regarding the reliability of these estimates. The most important of these concerns, which typically arise in the studies conducted at the national level using time series, are:

- a reverse causation from output to public capital;
- a spurious correlation due to common trends in output and public capital; and
- the omission of other variables.

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Table 1. Production function studies		
Author(s)	Aggregation level	Data
Aschauer (1989a)	National [United States]	Time series 1949-85
Munnell (1990)	National [United States]	Time series 1949-87
Tatom (1991)	National [United States]	Time series 1949-89
Eisner (1994)	National [United States]	Time series 1961-91
Aschauer (1989c)	National [Group of Seven]	Panel 1966-85
Ford and Poret (1991)	National [OECD (11 countries)]	Time series 1957-89
Berndt and Hansson (1991)	National [Sweden]	Time series 1960-88
Bajo-Rubio and Sosvilla-Rivero (1993)	National [Spain]	Time series 1964-88
Evans and Karras (1994b)	National [OECD(7 countries)]	Panel 1963-88
Otto and Voss (1994)	National [Australia]	Time series 1966-90
Toen-Gout and Jongling (1994)	National [Netherlands]	Time series 1960-90
Dalamaga (1995)	National [Greece]	Time series 1950-92
Holtz-Eakin (1992)	Regions [United States (9 regions)]	Panel 1969-86
Merriman (1990)	Regions [Japan (9 regions)]	Panel 1954-63
Costa, Elson, and Martin (1987)	States [United States (48 states)]	Cross section 1972
Munnell and Cook (1990)	States [United States (48 states)]	Panel 1970-86
Aschauer (1990)	States [United States (50 states)]	Cross section 1965-83 averages
Eisner (1991)	States [United States (48 states)]	Panel 1970-86
Garcia-Mila and McGuire (1992)	States [United States (48 states)]	Panel 1969-82
Munnell (1993)	States [United States (48 states)]	Panel 1970-90
Evans and Karras (1994a)	States [United States (48 states)]	Panel 1970-86
Holtz-Eakin and Schwartz (1995)	States [United States (48 states)]	Panel 1970-86
Garcia-Mila, McGuire, and Porter (1996)	States [United States (48 states)]	Panel 1970-83
Eberts (1986)	Metropolitan areas [United States]	Panel 1958-78

While a clear majority of the studies listed in table 1 | detect an important role for public capital in production,

various researchers raise a host of statistical concerns regarding the reliability of these estimates. The most important of these concerns, which typically arise in the studies conducted at the national level using time series, are:

- a reverse causation from output to public capital;
- a spurious correlation due to common trends in output and public capital; and
- the omission of other variables.

On the surface, a good case can be made for a reverse causation from output to public capital. Without doubt, an increase in output, per capita income, and tax revenue induces federal, state and local governments to increase spending on public capital. As Aschauer (1993) argues, however, there is “nothing special” about public capital in terms of the possibility of reverse causation. In particular, a similar concern can be raised with respect to private capital, yet no one denies that private capital is an important factor in private production. Further, in a more technical fashion, empirical studies find that *past* public investment is associated with *current* output--that is, public capital *Granger causes* output, which leads to a presumption of a causal role for public capital.

Many critics of the production function studies contend that a key problem is that the output, private input, and public capital data all tend to grow over time, which results in a spurious correlation between output and public capital. These same critics argue that it is necessary to transform the data--typically, to work with growth rates rather than levels of the relevant variables--to eliminate the non-stationarity and the spurious correlation problem from the empirical analysis. It is true that such a transformation of the data often (yet not always) tends to reduce the size and statistical importance of the relationship between public capital and private output. But as noted by Aschauer (1993), this is to be expected; the postulated relationship between public capital and output is a *long run* relationship while fluctuations in economic growth are primarily driven by *short run* factors such as transitory technology shocks, exchange rate movements, and shifts in monetary and fiscal policies.

Finally, it is logically possible that the correlation between public capital and output or productivity actually is due to public capital acting as a proxy for other variables omitted from the empirical analysis. Various economists suggest that specific variables,

ranging from the elementary school-aged population to the yen/dollar exchange rate, appear to “explain” private output in as statistically significant a fashion as does public capital. Because these authors see no particular reason that such a relationship is more than coincidental, they argue that the association between private output and stocks of public capital *also* may be coincidental. In response, Aschauer (1993) makes the point that this manner of argument is inherently unscientific. A valid empirical study, it is argued, is built on the foundation of one or more refutable hypotheses--such that public capital influences private sector output--and proceeds by using available data to directly challenge the hypothesis. The method proposed by these other researchers is to search the universe of available data for one series which will attenuate the relationship between the public capital stock and output--a search which is completely unconstrained by theory. Given sufficient effort (and a computer configured with a Pentium 233 MHZ or higher chip), it seems inevitable that these researchers would succeed in their attempt to “disprove” the importance of public capital to private economic performance.

While it is a fairly easy task to offer counter-arguments, a preferable route would involve making use of alternative estimation strategies which, in effect, allows one to finesse the criticisms. Such strategies include the cost function and profit function approaches.

Cost function approach

The cost function approach involves the assumption that private sector firms choose capital and labor inputs in such a way as to minimize the cost of producing any given amount of output. Thus, the cost function, C , is obtained as the solution to the problem: solution to the problem:

where the user cost of capital, r , the wage paid to laborers, w , and the public capital stock are taken parametrically. In this context, public capital improves economic performance if it allows firms to reduce the amount of capital or labor--and, thereby, costs--necessary to produce a given amount of output.

Table 2 provides a list of recent empirical studies which have used the cost function approach to measure the importance of public capital. The shaded rows--in this case, the entire table--represent studies which find an important role for public capital in lowering private production costs. As with the production function approach, most of the studies are based on data from the United States. However, nearly all of the studies make use of panel data rather than time series data and, as a result, avoid some of the criticisms pointed toward the production function studies. Generally speaking, the

cost function studies find that public capital does, indeed, lower costs of production in most industries--particularly manufacturing--in most countries and over most of the time periods. For example, on the basis of their estimates, Conrad and Seitz (1994) argue that the slowdown in growth of public capital is an important determinant of recent reductions in the pace of German productivity growth.

Table 2. Cost function studies		
<i>Author(s)</i>	<i>Aggregation level</i>	<i>Data</i>
Berndt and Hansson (1991)	National [United States]	Time series 1960-88
Lynde and Richmond (1992)	National [United States]	Time series 1958-89
Nadiri and Mamuneas (1994a)	National [United States]	Panel 1956-86
Nadiri and Mamuneas (1994b)	National [United States]	Panel 1956-86
Morrison and Schwartz (1992)	National [United States]	Panel 1970-78
Conrad and Seitz (1994)	National [Germany]	Panel 1961-88
Feltenstein and Ha (1995)	National [Mexico]	Panel 1970-90
Dalamagas (1995)	National [Greece]	Time series 1950-92
Lynde and Richmond (1993b)	National [United Kingdom]	Time series 1950-92
Seitz (1993)	National [Germany]	Panel 1970-89
Shah (1992)	National [Mexico]	Panel 1970-87
Keeler and Ying (1988)	Regions [United States (9 regions)]	Panel 1950-73

Profit function approach

The profit function approach is the “dual” to the cost function approach and involves the assumption that private sector firms choose capital and labor inputs in such a way as to maximize profits. That is, firms are taken to solve the problem of maximizing profits, P , where

by choosing appropriate levels of capital and labor given factor prices and the availability of public capital.

Table 3 lists papers which investigate the importance of public capital to private economic performance using the profit function approach; as in previous tables, the shaded rows indicate an important role for public capital. Generally speaking, these papers indicate a sizeable impact of public capital on output and profitability in the private sector. For example, Lynde and Richmond (1993a) use their estimates to argue that as much as 40% of the productivity slowdown in the United States can be explained by a decline in public capital investment in recent decades.

Table 3. Profit function studies		
<i>Author(s)</i>	<i>Aggregation level</i>	<i>Data</i>
Lynde (1992)	National [United States]	Time series 1958-88
Lynde and Richmond (1993b)	National [United States]	Time series 1958-89
Dalamagas (1995)	National [Greece]	Time series 1950-92
Deno (1988)	Metropolitan areas [United States]	Panel 1970-78

Taken together, the production function, cost function, and profit function studies all lead to the conclusion that public capital is a key determinant of the performance of the private sector economy. But these findings--which are *static* in nature--leave open the question of the *dynamic*, or growth effects of public capital on the economy. To answer this question, it is just as important to understand the dynamic interrelationship between productivity, output, and employment as the economy evolves over time as it is to know the static effect of public capital. For example, depending on the persistence of the increase in the productivity growth rate, any particular static increase in productivity can translate into a rather small or large increase in the long run level of output per worker. Consider the following formula for the cumulative change in productivity given a series of changes in productivity growth:

where y represents (the natural logarithm of) productivity, Dy_t , the growth rate of productivity in period t , Dy the initial growth rate of productivity, and r_y a persistence parameter for productivity growth. Making use of the static estimates from the studies cited above--say, that a one standard deviation increase in public capital raises initial productivity growth by 1% per year--a purely transitory, one period increase in productivity growth (represented by $r_y = 0$) will lift long run output per worker by only 1%, while a highly persistent increase in productivity growth (represented by, perhaps, $r_y = 0.9$) will boost the long run level of productivity by 10%. In the extreme case of a permanent increase in productivity growth (where $r_y = 1$), a given increase in public capital ultimately will generate an indefinitely large increase in output per worker.

Dynamic effects of public capital: economic growth

A number of researchers attempt to capture the dynamic effects of public capital on economic growth and, thereby, on the long run level of output. Typically, these studies focus on the dynamics surrounding the production function

where all variables are in natural logarithms and y stands for output per capita (or, at times, productivity), k denotes private capital (typically inclusive of tangible and intangible (*e.g.*, human capital)) per capita, and kg represents public capital per capita. Two classes of dynamic relationships between public capital and economic growth arise in this framework. The first class involves a production function which exhibits decreasing returns to scale in (private and public) capital (*i.e.*, $a_k + a_{kg} < 1$) and represents a variant of the traditional *neoclassical growth model* originally conceived by Solow (1956) and Swan (1956). In this case, a permanent increase in public capital potentially offers to

- induce a temporary (though possibly quite persistent) rise in economic growth and
- generate a permanent increase in the long run level of output per capita (or productivity).

The second class, following work by Romer (1986), contains a production function which displays constant

or increasing returns to scale in capital (*i.e.*, $a_k + a_{kg} =$ or > 1) and embodies a form of the *endogenous growth model*. In this alternative case, a permanent increase in public capital can be expected to

- raise economic growth on a permanent basis and
- cause ever increasing levels of per capita output.

Table 4 provides a list of recent empirical papers linking economic growth and public capital in the framework of either the neoclassical and endogenous growth model. These studies employ cross-sectional data over a large set of countries (*e.g.*, Barro (1991)) or the separate states within United States (*e.g.*, Aschauer (1997a,b,c) in order to capture long run rather than short run influences--as often would be the case with the use of time series data. The papers in the shaded rows find a sizeable, and statistically significant impact of public capital on economic growth.

The model in Aschauer (1997b,c) gives the flavor of the results of this literature. The conceptual approach involves a two equation model in output growth and employment growth. In the framework, a rise in public capital boosts the marginal products of private capital and employment and, given the rental price of private capital and the wage, stimulates private capital accumulation and employment growth. The rise in the growth rates of private capital and employment, in turn, stimulates the growth of output.

Table 4. Economic growth studies

<i>Author(s)</i>	<i>Aggregation level</i>	<i>Data</i>
Aschauer (1989c)	OECD [Group of Seven]	Panel 1970-86
Barro (1991)	76 countries	Cross section 1960-85
Easterly and Rebelo (1993)	100 countries	Cross section 1970-88
Hulten (1996)	46 countries	Cross section 1970-90
Aschauer (1997a, b, c)	48 U.S. states	Panel (decadal averages) 1970-90
Holtz-Eakin (1994)	48 U.S. states	Panel 1970-86

Holtz-Eakin and Schwartz (1995)	48 U.S. states	Panel 1971-86
<p>The empirical results are used to trace out the time paths for output, employment, and labor productivity subsequent to a 10% increase in public capital in this framework. After initially increasing by 0.8% and 0.3% per year, respectively, output and employment growth continue to expand for a period of time. Output growth peaks at 0.9% per year after 9 years while employment growth peaks at 0.5% per year after 18 years. Output growth remains above employment growth--thereby generating productivity gains--for some 40 years. Finally, the impact of public capital on economic growth is quite persistent; indeed, it takes a full 100 years or more before the growth effects of the rise in public capital essentially have disappeared.</p> <p>The cumulative, or long run effect of the change in public capital on the level of output, employment, and productivity are quite substantial over a 200 year horizon. For example, output climbs by 27%, over two and one-half times the percentage increase in public capital. Over three-quarters of the increase in long run output comes from gains in employment (which increases by 21%), while less than one-quarter arises from private capital accumulation and, thereby, productivity improvements (which rises by 6%).</p> <p>We see, then, that there is a strong conceptual and empirical basis for arguing that there is, indeed, a causal relationship between public capital and economic performance--at least for advanced industrialized economies. But given the available evidence, it is more difficult to make a similarly strong case for such an important role for public capital in developing economies. In what follows, therefore, we attempt to provide some new evidence on the importance of public capital to economic growth in lesser developed countries.</p> <p>Public capital and economic growth: new estimates for developing countries</p> <p>We follow work by Mankiw, Romer, and Weil (1992) and Hulten (1996) in order to capture the separate economic growth effects of private tangible capital, public capital, the efficiency of public capital, and human capital. Consider a slight elaboration on the previous discussion, with a production function for private output is given by</p>	<p>where kp denotes the natural logarithm of private tangible capital per capita, eff represents the efficiency of use of public capital, and h stands for the natural logarithm of human capital per capita. In the framework of the neoclassical growth model, this production structure implies the corresponding growth expression</p> <p>where $y(T)$ and $y(0)$ represent the level of output per capita in the terminal and initial years chosen for the empirical analysis and “*” denote long run (or steady state) values of the various capital stocks. These long run capital stocks are</p> <p>related to savings/investment rates by the formula where iz denotes the natural logarithm of investment (as a percent of output) and d represents the natural logarithm of an effective depreciation rate (the sum of the rate of population growth, the (exogenous) rate of technological progress, and the physical depreciation rate of capital).</p> <p>As the growth expression is derived from the production function (for details, see Mankiw, Romer, and Weil (1992)), the growth elasticities (<i>i.e.</i>, the b's) are related to the output elasticities (<i>i.e.</i>, the a's) by the formula</p> <p>Similarly, the convergence rate--the rate at which the economy moves from one to another long run equilibrium as a result of an exogenous shock such as an increase in the public capital stock--is determined from the coefficient on the initial level of output per capita.</p> <p>We now estimate the growth expression using data for 46 developing countries over the period from 1970 to 1990. The basic data set comes from Easterly and Rebelo (1993) and various issues of the World Bank annual publication <i>World Development Report</i>. Private</p>	

and public capital investment rates--expressed as fractions of output--are averaged over the period 1970 to 1990 and then, following Mankiw, Romer, and Weil (1992), are taken as ratios to the effective depreciation rate, d , over the period 1970 to 1990 to generate proxies for private and public capital stocks. The secondary education enrollment rate serves as a proxy for human capital. This data set can be seen as an augmentation of the data set utilized by Hulten (1996) to study the relative importance of the *quantity* and *efficiency of use* of public capital in developing countries. In particular, the data set used in the current paper presents a continuous, rather than dichotomous, measure of the efficiency of public capital and includes other variables in order to gain a deeper understanding of the importance of public capital to growth in developing countries.

Table 5 presents the basic estimates of the expression linking growth in per capita output to the various capital stocks and the efficiency of use of public capital. The first equation considers the relative importance of

tangible and intangible capital. The growth elasticity of tangible capital equals .67, the growth elasticity of intangible (human) capital equals .27, and both coefficient estimates are significantly different from zero at conventional measurement levels. The corresponding output elasticity of tangible capital equals .50 while the output elasticity of human capital equals .20. These output elasticities are only somewhat larger than previous estimates in the literature--for instance, Mankiw, Romer and Weil (1992) contains output elasticities of .44 and .23 for tangible and intangible capital. As these output elasticities of tangible and intangible capital sum to .70, the estimates imply diminishing returns to total capital and, thereby, suggests that the neoclassical growth model framework is appropriate for this set of countries. Finally, the convergence rate, calculated using the coefficient on initial output, is equal to 2.5% per year which, in turn, implies that the *half life* of a shock to long run output is approximately 28 years. This, too, is directly in line with the available estimates from the literature.

Table 5. Growth and public capital
Dependent variable: $y(90) - y(70)$

	(1)	(2)	(3)	(4)
<i>constant</i>	.88 (.57)	1.20 (1.42)	1.42 (.56)	1.53 (1.41)
$y(70)$	-.38 (.10)	-.38 (.10)	-.36 (.10)	-.36 (.10)
k	.67 (.18)	.68 (.18)	—	—
kp	—	—	.31 (.08)	.31 (.08)
kg	—	—	.30 (.11)	.30 (.11)
h	.27 (.07)	.28 (.07)	.25 (.07)	.25 (.07)
d	—	.13 (.24)		.04 (.53)
adj. R^2	.43	.42	.45	.44
S.E.R.	.31	.31	.31	.31

Note: standard errors in parentheses.

The second equation in table 5 allows for a separate influence of population growth (*via* the natural logarithm of the effective depreciation rate) on economic growth which, in turn, allows a test of the appropriateness of the assumption of constant returns to scale over *all* productive inputs: raw labor as well as tangible and intangible capital. Specifically, the assumption of constant returns to scale cannot be rejected if the coefficient on the effective depreciation rate variable does not differ from zero at conventional levels of statistical significance. In the second equation, the point estimate of 13 carries a standard error of .24--and so we cannot reject constant returns over all factors.

The third equation of table 5 decomposes the tangible capital stock into private and public capital in order to assess the relative importance of these two types of capital to economic growth. Evidently, the growth elasticities of private and public capital are nearly equivalent at .31 and .30, respectively, and are both statistically significant at standard levels. The growth elasticity of human capital is somewhat smaller, at .25, and of a similar level of statistical significance. The corresponding output elasticities of .25, .25, and .20 for private capital, public capital, and human capital are all reasonable and consistent with overall decreasing returns to scale to capital inputs.

The fourth equation of table 5 allows the test of the hypothesis of constant returns to scale over all productive inputs. The coefficient estimate of .04 on the effective depreciation rate variable is not statistically different from zero and, as a consequence, there is little basis to reject the assumption of constant returns over raw labor and capital inputs

Recently, Hulten (1996) has presented estimates of the effects of public capital on growth in a framework which also takes into account the efficiency with which the public capital stock is employed in production. He argues that the effective public capital stock--the relevant argument in the production function--is itself a function of both the quantity of public capital as well as the average effectiveness of public capital as in

where *eff* is an observable measure of the efficiency of use of public capital.¹ In Hulten (1996), the basic efficiency variable is composed of various performance indicators for public capital: electricity generation

losses as a percent of total system output for electricity; the percentage of paved roads in good condition and diesel locomotive utilization as a percentage of the total rolling stock for road and rail transportation; and mainline faults per 100 telephone calls for telecommunications. As these performance measures are in different units, Hulten sees "no natural way of adding up the indicators in this form to arrive at a total." His solution is to sort the various indicators into quartiles, assigning values of .25, .50, .75, and 1.00, and then adding up across the quartile rankings to obtain a unit free aggregate index. This procedure, however, results in a dichotomous variable which detracts from the ability to make efficiency comparisons across countries.

In the present paper, we take a different approach which leads to a *continuous* measure of efficiency across countries and, thereby, facilitates cross-country comparisons. Here, we first normalize each of the indicators so that performance in a particular category--say, telecommunications--is measured in terms of standard deviations from the average level of performance. We then take the simple average across performance indicators to obtain an aggregate performance index for each country. The resultant index, which necessarily takes on an average value of zero, ranges from a high value of 1.71 for Mauritius and a low value of -1.43 for Nigeria.

The equations presented in table 6 show the impact of adding the efficiency variable to the basic growth expression. The coefficient estimate on the efficiency variable lies in the range of .30 and is highly statistically significant. This coefficient estimate implies that a one standard deviation increase in public capital efficiency (*i.e.*, an amount equal to .66 efficiency units) will induce a one-half standard deviation increase (*i.e.*, 1%) in the average annual rate of economic growth over the 20 year sample period. The introduction of the efficiency variable also has the effects of:

- reducing the magnitude and statistical significance of the growth elasticities of tangible and human capital;
- eroding, rather substantially, the statistical significance of the relationship between the quantity of public capital and economic growth; and
- shrinking the coefficient on the initial level of output and, thereby, the convergence rate (from 2.5% per year to 2.0% per year).

Table 6. Growth, public capital, and efficiency
Dependent variable: $y(90) - y(70)$

	(1)	(2)	(3)	(4)
<i>constant</i>	1.07 (.48)	1.04 (1.20)	1.35 (.47)	1.24 (1.17)
<i>y(70)</i>	-.30 (.09)	-.30 (.09)	-.30 (.09)	-.29 (.09)
<i>k</i>	.26 (.18)	.26 (.18)	—	—
<i>kp</i>	—	—	.17 (.07)	.17 (.07)
<i>kg</i>	—	—	.11 (.11)	.11 (.11)
<i>eff</i>	.35 (.08)	.35 (.08)	.34 (.08)	.34 (.08)
<i>h</i>	.20 (.06)	.20 (.06)	.18 (.06)	.18 (.06)
<i>d</i>	—	-.01 (.45)	—	-.04 (.44)
adj. R ²	.60	.59	.62	.61
S.E.R.	.26	.27	.26	.26

Note: standard errors in parentheses.

Similar results led Hulten (1996) to state that, from the perspective of economic research “just as early studies of the sources of international growth inappropriately ignored infrastructure capital, it is no longer appropriate to ignore the efficiency with which this capital is used.”

Indeed, from a policy perspective, it is Hulten’s belief that “programs aimed only at new infrastructure construction may have a limited impact on economic growth, and may have a perverse effect if they divert scarce resources away from the maintenance and operation of existing infrastructure stocks.”

A close reading of Hulten’s paper, as well as the above results, suggests that Hulten is being fairly generous to the notion that new public capital will have an

important positive impact on economic growth. In particular, the coefficient on public capital in the equations listed in table 5, while positive, is quite small and of a low level of statistical significance. One could argue on the basis of these results that public capital shows *no* statistical association with economic growth.

Yet this model is lacking, for at least one important reason: it ignores the means of financing public capital. Following Barro (1990), Aschauer (1997a) shows how an increase in public capital has both a positive and negative influence on long run output and transitional growth rates. The positive effect comes from the direct role of public capital in the production of goods and services. The negative effect arises from an adverse

influence of public debt which, ultimately, requires an increase in distorting taxation on labor and/or private capital. If--and only if--the former, positive effect dominates the latter, negative effect, will an increase in public capital stimulate growth. So an alternative interpretation of the low level of statistical significance of the public capital variable in the equations in table 6 is that this coefficient is capturing the *net* (of financing) rather than the *gross* effect of public capital on growth.

The equations regressions contained in table 7 explore the possibility of a trade-off between the productivity of capital and the burden of financing capital by including the external debt ratio in the basic growth expression. In 1980, the level of total external debt--a measure of the burden placed on the economy associated with the financing of capital expenditures--averaged some 45% of output for the developing countries in the sample. The maximum debt ratio, attained in Mauritania, reached 126% of output, while the minimum debt ratio, achieved in Mozambique, equaled 0.1% of output. The coefficient estimate on external debt lies in the range of

-.50 and is highly statistically significant. This coefficient estimate implies that a one standard deviation increase in external debt (*i.e.*, an amount equal to 27% of output) will cause a one-third standard deviation increase (*i.e.*, 0.7%) in the average annual rate of economic growth over the 20 year sample period. The introduction of the external debt variable also has the effects of:

- increasing the magnitude and statistical significance of the growth elasticities of tangible and human capital--to approximately the same levels as in table 5;
- returning public capital to statistical significance, with an estimate of the growth elasticity of public capital centered on .24; and
- marginally raising the coefficient on the initial level of output and, thereby, the convergence rate (2.3% per year).

	(1)	(2)	(3)	(4)
<i>Constant</i>	1.33 (.44)	2.14 (1.12)	1.71 (.42)	2.51 (1.07)
<i>y(70)</i>	-.34 (.08)	-.35 (.08)	-.33 (.07)	-.34 (.08)
<i>k</i>	.41 (.16)	.43 (.17)	—	—
<i>kp</i>	—	—	.22 (.07)	.23 (.07)
<i>Kg</i>	—	—	.23 (.10)	.25 (.10)
<i>Eff</i>	.32 (.07)	.31 (.07)	.30 (.07)	.30 (.07)
<i>h</i>	.22 (.05)	.24 (.06)	.20 (.05)	.22 (.06)
<i>debt</i>	-.45 (.14)	-.47 (.14)	-.49 (.13)	-.52 (.14)
<i>d</i>	—	.33 (.42)	—	-.32 (.81)
adj. R ²	.68	.68	.71	.71
S.E.R.	.24	.24	.22	.22

Note: Standard errors in parentheses.

Overall, the empirical results contained in table 7 suggest that a proper extended analysis of the impact of public capital on economic growth should take into account not only the efficiency of use of public capital but also the means of financing public capital. We illustrate this point by calculating the net effect on economic growth of an external debt financed increase in public capital. These calculations are performed using the expression

where we have imposed the condition $d[\exp(kg)] - d[\exp(debt)] = 0$. The implied net growth effects average -26% across the entire sample and range between a high value of -0.2% for Guatemala and a low value of -42.5% for Algeria.

Of course, another means of financing public capital is possible--namely, a reorientation of public spending priorities away from government *consumption* to government *investment*. It appears that for many countries in the sample there is significant scope for such a financing mechanism as the average level of government consumption equaled 13% for the entire sample of 46 countries in recent years. The high value of government consumption of 26% of output was reached in Zimbabwe while the low value of 5% of output was achieved in Argentina.

Table 8 adds the natural logarithm of the government consumption ratio to the basic growth expression. As a general rule, the ratio of government spending is of little quantitative and statistical value in explaining economic growth across the 46 country sample. Specifically, the highest value of the growth elasticity of government consumption is only .06 with an associated standard error of .11. The implication, therefore, is that a shift in government spending away from consumption to investment would induce an increase in economic growth. The associated growth impact can be calculated by use of the expression

where we have imposed the condition that $d[\exp(ig)] + d[\exp(gc)] = 0$. The implied growth effects average 2.15 over the entire sample of countries and reach a high of 5.04 in Uruguay and a low of .38 in Algeria.

The good, the bad, and the ugly

In order to gain a better understanding of the growth experience of the developing economies, it is useful to focus on the high achievers and low achievers of the countries in the sample. To this end, table 9 presents statistics on economic growth and associated relevant variables for the five highest and five lowest economic growth rate countries in the data set. The five highest growth countries--Egypt, Indonesia, Mauritius, Portugal, and Thailand--delighted in an expansion of per capita output of 4.3% per year. The five lowest growth economies--Burundi, Mozambique, Nigeria, Sierra Leone, and Zambia-- (truly) suffered through a contraction of per capita output of 3.0% per year.

In terms of the factors which, in the preceding analysis, have been found to be associated with economic growth, the high growth countries were "doing it right" in that they experienced low population growth, maintained healthy rates of private and public investment, operated their public capital in an efficient manner, educated their population, and were restrained in their use of public debt. Two variables--population growth, at 1.7% per year, and efficiency of use of public capital, at an index value of .88Bwere more than one standard deviation removed from the respective sample averages. The low growth countries, on the other hand, were "doing it wrong" in many ways, particularly in that they maintained a dismal rate of private investment and failed to operate their public capital in an efficient way. Each of these variables, with average values of 3.6% of GDP for private investment and -.86 for the efficiency of use of public capital, were more than one standard deviation from the respective sample averages. Interestingly, the low growth countries did not lack for public investment, achieving a public investment rate of 11.6% of GDP--somewhat *higher* than the 10.6% of GDP for the high growth countries--but the low value of the efficiency index calls into question the likely quality of those investments.

Table 8. Growth, public capital, and government consumptionDependent variable: $y(90) - y(70)$

	(1)	(2)	(3)	(4)
<i>constant</i>	1.24 (.56)	2.10 (1.12)	1.54 (.53)	2.32 (1.25)
<i>y(70)</i>	-.34 (.08)	-.35 (.08)	-.33 (.08)	-.34 (.08)
<i>k</i>	.41 (.17)	.43 (.17)	—	—
<i>kp</i>	—	—	.23 (.07)	.23 (.07)
<i>kg</i>	—	—	.22 (.10)	.24 (.10)
<i>eff</i>	.32 (.08)	.31 (.08)	.30 (.07)	.29 (.07)
<i>h</i>	.22 (.05)	.24 (.06)	.21 (.05)	.22 (.06)
<i>debt</i>	-.45 (.14)	-.47 (.14)	-.49 (.13)	-.51 (.14)
<i>gc</i>	.03 (.11)	.01 (.11)	.06 (.11)	
<i>d</i>	—	.32 (.44)	—	.29 (.42)
adj. R ²	.67	.66	.71	.70
S.E.R.	.24	.24	.22	.23

Note: Standard errors in parentheses.

Table 9. Determinants of economic growth in the 5 highest and 5 lowest economic growth rate countries

Shaded cells contain values of variables which are at least 1 standard deviation above or below the sample mean

	High growth ¹	Low growth ²	Sample ³	
			Mean	St. dev.
Growth in output per capita (% per year)	4.3	-3.0	0.8	2.0
Initial (1970) output per capita (1985 \$)	1,659	1,328	1,827	1,150
Population growth (% per year)	1.7	2.7	2.6	0.7
Private investment (% of GDP)	12.0	3.6	10.2	4.3
Public investment (% of GDP)	10.6	11.6	10.0	5.0
Efficiency (index)	.88	-.86	.000	.601
Secondary education enrollment (% of age group)	31.0	6.8	19.7	15.1
External public debt (% of GDP)	28.0	22.5	30.1	23.4

1. The 5 highest economic growth countries are Egypt, Indonesia, Mauritius, Portugal, and Thailand.

2. The 5 lowest economic growth countries are Burundi, Mozambique, Nigeria, Sierra Leone, and Zambia.

3. Entire 46 country sample.

A continent apart: Mauritius and Sierra Leone

Another way of gaining a better understanding of the growth process involves focusing on the performance of the highest and lowest growth countries in the sample—Mauritius and Sierra Leone—and looking at their levels of investment in private capital, public capital, and human capital as well as the efficiency of use of public capital and the degree of reliance on external public debt to finance public sector expenditures. Table 10 presents statistics on these variables for the *out of sample* period 1990 to 1995. Both countries maintained similar public investment rates, at 4.1% of GDP for

Mauritius and 3.9% of GDP for Sierra Leone. However, the two countries differed strikingly in the efficiency of use of public capital, with an efficiency index value of 1.71 for Mauritius and -.49 for Sierra Leone. The two countries also contrasted to a significant degree in their reliance on external public debt, with debt to GDP ratios of 11.2% for Mauritius and 92.5% for Sierra Leone. Looking to other factors influencing growth, Mauritius, relative to Sierra Leone, also maintained low population growth (1.1% per year vs. 2.4% per year), and very high private investment (25.5% of GDP vs. 4.0% of GDP). The results of the previous empirical analysis can be

used to forecast rates of growth for Mauritius and Sierra Leone based on the above readings on their respective levels of investment in private capital, public capital, and human capital as well as their efficiency of use of public capital and use of external public debt. The regression results imply expansion of 3.6% per year for Mauritius and contraction at -6.2% per year for Sierra Leone-rates which would have allowed the level of per capita output to climb from US\$ 5,655 to US\$ 6,696 (1985 US\$) in Mauritius and would have compelled the level of per capital output to slide from US\$ 835 to US\$ 576 in Sierra Leone. In actuality, the economy in Mauritius expanded at a slightly higher rate, at 3.8% per year, leading to a rise in per capita output to US\$ 6,729, while that of Sierra Leone contracted at a somewhat sharper, at -7.1% per year, forcing a decline in per capita output to US\$ 551.

Conclusion

After providing a review of various approaches to determining the impact of public capital on economic performance, this paper has extended the neoclassical model to assess the importance of three aspects of government intervention on economic growth on the transition path to the steady state: public physical capital is included along with private physical capital and human capital as an input in the steady state production function; the means of financing public capital is allowed to affect the level of productivity; and the efficiency of use of public capital--along with the quantity of public capital--is taken to determine the effective public capital stock.

In this setting, three questions pertaining to economic growth may be asked: Does the quantity of public capital matter? Does the means of financing public capital matter? Does the efficiency of use of public capital matter?

The empirical results presented in this paper allow affirmative answers to each of these questions. Specifically, we find that:

- a 10 percent increase in either the quantity or the efficiency of public capital are estimated to *increase* output per capita by 2.9 percent over two decades;
- a 10 percent increase in external public debt is estimated to *decrease* output per capita by 1.7 percent over the same time frame;
- an “average” increase in public capital, financed by external debt, is estimated to detract from economic growth in an amount equal to some .25 percent per year; but
- an “above average” increase in public capital--defined as a simultaneous increase in quantity and efficiency of public capital--is estimated to have a minor positive impact on economic growth by an amount equal to .1 percent per year.

The main policy lesson to be drawn from these findings can be simply stated: *In formulating economic development policies, countries are well advised to pay as much attention to how public capital is financed and to how well it is used as to how much public capital is accumulated*

Table 10. Determinants of economic growth in the highest (Mauritius) and lowest (Sierra Leone) economic growth rate countries 1990-1995		
	High growth (Mauritius)	Low growth (Sierra Leone)
Actual growth in output per capita (% per year)	3.8	-7.1
Initial (1990) output per capita (1985 \$)	5,655	835
Population growth (% per year)	1.1	2.4
Private investment (% of GDP)	25.5	4.0
Public investment (% of GDP)	4.1	3.9
Efficiency (index)	1.71	-.49
Secondary education enrollment (% of age group)	59.0	12.0
External public debt (% of GDP)	11.2	92.5
Predicted growth in output per capita (% per year)	3.6	-6.2
Predicted (1995) output per capita (1985 \$)	6,696	576
Actual (1995) output per capita (1985 \$)	6,729	551

Sources of data for Table 10:

Output (levels and growth): *International Financial Statistics Yearbook (1998)*

Population (levels and growth): *International Financial Statistics Yearbook (1998)*

Total investment: *International Financial Statistics Yearbook*

Public investment, public consumption, external public debt *Government Financial Statistics Yearbook (1997)*

Secondary education rate: *World Development Report 1998/99*

Efficiency index: author's calculations based on *World Development Report 1994*

Endnote

Hulten (1996) assumes the particular functional form

$$kg^e = \ln(\text{eff}) + kg$$

which is rejected by the data. Here, we assume that

$$kg^e = \text{eff} + kg$$

which, it turns out, is not rejected by the data.

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MILITARY EXPENDITURES IN LATIN AMERICA AND THE CARIBBEAN

By Eugenio Lahera and Marcelo Ortúzar*

A little-explored area of public expenditure

According to the *SIPRI Yearbook 1999*, “Latin America is the continent with the least transparency in military expenditure. It is difficult to obtain reliable military expenditure for these countries and thus to make proper assessments of their development”. This situation is not new; for decades military expenditure has received very little analysis in Latin America and the Caribbean.

This is not because the subject lacks importance or relevance. The central governments of Brazil and Argentina spent from 20% to 25% of their budgets on the military during the 1950s and the 1960s. In Mexico, military spending was lower, but nevertheless ranged from 6% to 10% of central government expenditures (International Monetary Fund, various years). Today military spending remains an impressive 9.5% of central government expenditures for the region as a whole. No other important part of the region’s economy has remained unexplored for so long, by conventional as well as radical economists. In part this is a reflection of political decisions to limit access to relevant information by declaring this part of the budget to be secret or confidential.

Conditions are changing, however, and military expenditure is becoming a subject of economic analysis by governments, multilateral organizations and research institutes:

- As a result of the end of the Cold War, the role of military expenditure has been reassessed and such spending has been sharply reduced; although the conflicts that still remain are quite serious, they have fewer regional or global implications.
- In the case of Latin America, there has also been a process of pacification and demilitarization,

and democratic regimes have replaced authoritarian governments supported or run by the military.

- Economic integration has also helped to change traditional views regarding armed conflict, even between countries with a history of settling disputes with military action.
- Interest in the efficiency and efficacy of public expenditure has led to keen scrutiny of the function of military spending in strategies of development.

Nonetheless, there is still little transparency in the analysis of this substantial item of expenditure, both with regard to its accounting and budgetary treatment and with regard to its effects on efficient resource allocation and on the development process in general (ECLAC, 1998). At the same time, as there is a lack of analytical capacity defense economics, which rose to importance in the 1960s in the United States, remains undeveloped within the region.

Is defense a public good?

The main justification for public expenditure on the military is that it provides numerous positive externalities, the most important being deterrence - or, if needed, defense - that is, preservation of national autonomy and territorial integrity. The armed forces’ ability to ameliorate the impacts of natural disasters are often regarded as another positive externality. Defense and deterrence – combined with other public goods, such as the quality of the legal system and the legitimacy of the political system – affects the way the economy operates, by providing an environment of security and stability (Lahera, 1997a).

Globalization and economic integration may give rise to non-territorial conflicts. The internationalization of economic interests can either reduce or increase the demand for defense and deterrence, depending on the

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particular case. Although sovereignty has been fading since the end of World War II, governments in general have ceded powers voluntarily. European nations have voted their way into military, political and monetary unions. Globalization reduces the importance of natural borders, but nations are free to choose whether or not to open their political borders. In 1998, 120 nations signed a treaty establishing an international criminal court, in which international law supercedes national sovereignty. That is a shift toward respecting a nation's sovereignty only when it respects the rights of its people as defined by international law. The Nuremberg tribunal had introduced the concept that leaders' treatment of their own people was subject to international prosecution.

Military spending can also result in negative externalities that threaten democracy. Civil-military relations can be regarded as a euphemism for the relations between the political and the military power. Coups are not the only sort of military intervention that endangers democracy; military manipulation of civilian institutions and politics also undermines the democratic process. This manipulation includes the structural parameters of civilian power that the military imposes in order to protect its core political interests without need for much direct coercion (McSherry, 1999). Violations of basic human rights by the military are, of course, negative externalities as well. A commission of 17 Nobel Peace laureates is promoting an international code of conduct on arms transfers. Its aim would be to insure that weapons are not sold to countries that violate human rights or suppress democracy.

Characteristics of public goods

In the late 1730s, David Hume noted that there were tasks which, even though they do not generate gains for any individual in particular, are beneficial for society as a whole and can therefore only be carried out through collective action (Hume, 1739). In the twentieth century, our knowledge of these matters has increased mainly due to the contributions of Paul Samuelson (Samuelson, 1954, 1955).

According to Samuelson, a good whose benefits are shared indivisibly among the entire community,

regardless of whether particular persons wish to consume it or not, is a public good. This contrasts with private goods, which, if consumed by one person, cannot be consumed by another. When it is provided, national defense automatically benefits all persons, who receive the same amount of national security as all the other residents of the country. In the language of economics, pure public goods are nonrival and non-excludable.

The benefits of public goods are spread so widely among the population that no enterprise or consumer has any economic incentive to supply them optimally (Samuelson and Nordhaus, 1993). Public goods cannot be rationed by price; consequently, it is not efficient to leave their provision to private enterprise. Examples of this type of good are the provision of national defense and the maintenance of public internal order, or the financing of fundamental scientific research and public health. On the other hand, the reluctance of citizens to finance services which benefit them regardless of whether they help to finance them or not gives rise to the problem of free-riders, so their financing must be made compulsory through taxes (Stiglitz, 1995).

Military spending and the provision of defense: more questions than answers

Defining the public good of defense solely in military terms gives a false picture of the actual situation. Security problems may focus on the military, but they also embrace social, political, economic, cultural and environmental concerns (Ullman, 1993). National defense capacity itself is determined by factors other than military preparedness, including, in particular, diplomacy and international law and cooperation (Lahera, 1997b).

For these reasons, it cannot be assumed that a reduction in military spending brings with it a strictly proportional reduction in security or well being. The level of defense provided is not a direct function of military expenditure. It is not reasonable to use such expenditure as the sole indicator of the level of defense, even if the efficiency factor remains constant.

How might one estimate the amount of defense that is supplied at any given time? Ideally, one would like to measure security from possible aggression or threats from outside, although in some countries the main

threat to security is internal, from insurgents or drug traffickers. The scenarios are country specific.

Before deciding to increase military expenditure it is necessary to determine first whether this will achieve the desired objective, and second whether the same effect could be achieved by other means, with less resources. These are standard economic problems, dealing with the efficacy and the efficiency of public expenditure. With an optimum level of expenditure, the value of the last dollar spent on defense equals the utility of the marginal dollar spent in the other sectors of the economy. To establish such equilibrium requires full knowledge of the links between the military and the other sectors. The answer is far from obvious (Picciotto, 1992).

Some argue that defense spending is necessary for economic development. The Managing Director of the International Monetary Fund (IMF), however, has declared that “excessive military expenditure diverts resources from human development (...). The sales of military equipment beyond what can reasonably be justified, severely undermines peace and development”.

Poor nations everywhere should “reduce military expenditure to 1.5% of GDP and maintain zero growth of defense budgets for the next decade” (Camdessus, 1999). Moreover, during the 1970s and 1980s, developing countries spent a higher proportion of their gross domestic product on defense than the industrialized countries, so there does not appear to be any direct relation between an increase in national income and the increase in military spending needed to maintain the level of security.

Furthermore, while levels of military expenditure vary from country to country for reasons that are sometimes due to historical or domestic political factors, the dispersion of such expenditure is extremely high. Military expenditures per capita in Latin America and the Caribbean averaged US\$ 52 (the weighted average was US\$ 57) in 1996, but there were big differences between countries. In fact, per capita military expenditures in some Latin American countries exceeded that of some North Atlantic Treaty Organisation (NATO) members¹. The same is true for the number of military personnel per thousand inhabitants or per square kilometer (table 5). On the other hand, there are countries in the region that have very low military expenditures. Costa Rica abolished its armed forces in 1948, Panama has dissolved them as well, and Haiti has started a constitutional reform process which will abolish the armed forces.

The international perspective

The trade-off between military and non-military spending does not involve domestic resources alone, but has implications for resource allocation in other countries of the region. Given a situation of equilibrium, it is difficult to optimize the public good represented by defense through military spending in one country alone (Stiglitz 1988). Military expenditure by one country imposes negative externalities on nations that feel threatened. In fact, new rounds of arms increases can lead to proportional increases in military spending by neighboring countries. In that case, it may be expected that this will lead to the restoration of the previously existing defense balance, albeit at a higher level of expenditure. The alternative of all countries buying the best equipment available and increasing their defense level amounts to a fallacy of composition. The matching of expenditures by each side decrease the marginal benefit of each additional expenditure. No one will improve its relative position, but all will increase their expenditures.

The impact on defense levels of a coordinated reduction in military expenditure is very different from that of a unilateral reduction. Whereas the latter almost certainly reduces security, with a coordinated reduction of expenditure, the apparent reduction in security at the national level is offset by the greater security that stems from lower military expenditures in neighboring countries. A coordinated reduction in military spending, which does not change the strategic balance, would thus increase well being. A virtuous circle can be established in which reductions of expenditure in some countries lead to a reduction in such expenditure in others, provided the perceived risk of attack diminishes. A coordinated reduction of military expenditures thus tends to create conditions of stability between neighboring countries, which strengthens regional peace. Defense in this way is a regional public good. During the Cold War era this had political overtones, as regional security was understood mainly as security from the extra continental enemy. In recent years, defense has been regarded as a regional public good with respect to shared interests, such as the fishing activities of European or Asian factory ships in the territorial waters of Latin America and the Caribbean.

Military expenditure also contributes to a global public good, namely, global peace. An absence of international conflict allows for better resource allocation and an increase in flows of world trade and

investment. The challenge is to reduce regional and global security risks so that military expenditures can be maintained at a lower equilibrium level.

Simultaneous reductions of military expenditure at the international level operates in the same way as a cooperative agreement, with all the difficulties that this involves, including an incentive to act deceitfully.

There is also the possibility that it might be more advantageous for a particular country to remain outside the agreement. In the absence of a solution based on cooperation, a hypothetical means of correcting the negative externalities has been suggested. An international agency with the necessary authority could improve global well being by imposing equal fines on each country. The agency would then return the money to the countries according to a given formula. Under reasonable assumptions, reductions in the national defense budget would be sufficient to pay the national fines, even if the latter were not returned. Consequently, each country would be better off (Hewitt, 1991b).

It would be desirable to study the conditions, such as transparency and mutual confidence, that are required for regional moratoriums on military expenditure. Such moratoriums could be established for a specific period of time and applied to the introduction of given systems of arms. It is also possible to design mechanisms to impose quantitative and qualitative limitations on systems of armaments.

Mechanisms for prevention of conflict are also important. In addition to those already mentioned, others could be added such as early warning, including the establishment of academic observatories and virtual diplomacy mechanisms to promote dialogue. Greater transparency of military policies would also be helpful, along with unilateral policies designed to show a willingness to resort to the peaceful settlement of conflicts.² These policies might consist of dialogues involving non-traditional actors such as parliamentary commissions and meetings of political leaders and figures, academics and intellectuals; promotion of mutual confidence and security, including the important role played by verification; intervention of guarantors, and the use of compensatory measures, including the possible establishment of compensation funds (Rojas, 1997).

Reduced military spending also generates positive economic externalities at the international level as a result of lower interest rates and an increase in the volume of international trade. It may be expected that at least part of the saving will be used to increase non-

military expenditure, but part of it could also be returned to the private sector through reductions in the fiscal deficit or in taxes. An additional benefit would be a reduction in the cost of the public good "defense" obtained through military expenditure, thus making possible an increase in non-military expenditure without any marginal sacrifice of "defense" (Lee and Vedder, 1996).

The "peace dividend" seems to foster faster growth. Those governments that sharply reduced their military expenditure also reduced their total expenditure, thus potentially strengthening private investment. There is also indirect evidence that the cuts in military expenditure enabled these countries to maintain or increase their social expenditure. In contrast, governments that increased their military expenditure also increased other expenditures and their deficits. Higher military expenditure may have crowded out private and even public investment (Gupta, Schiff and Clements, 1996).

Economic impacts of military expenditure in developing countries

Aggregate effects on growth

In conventional short-term analysis, an increase in military expenditure on final goods and services can stimulate domestic demand, like any other public expenditure. The difference would be represented by the composition of public military expenditure (PME), which has a higher content of purchases of goods and services than the rest of public expenditure, which includes interest payments and transfers to local levels of government. Consequently, military expenditure could have a stimulating effect on growth by inducing an increase in capacity utilization: i.e., increasing the current product in relation to installed capacity. Even when aggregate production suffers from demand constraints, in situations of Keynesian unemployment, however, this function of military spending can be accomplished by more productive forms of public expenditure (Sen, 1987). As with any big reduction in public expenditure, defense cuts tend to reduce economic activity in the short term. In the long run, however, most economists think that lower defense spending should stimulate growth.

Various approaches have been used to examine the economic impact of military expenditures. One approach is an aggregate analysis of the correlation between military expenditure and economic

development in a group of countries. The most frequently cited study of this type is that by Emile Benoit, who found a positive correlation between military expenditure and economic growth for a sample of developing countries during the period 1950-1965 (Benoit, 1973). Benoit suggested that this result might be due to the demand stimulus caused by military expenditures, the generation of positive externalities, provision of basic consumer goods by the military, and the attractiveness to foreign investors of countries with high levels of military expenditure. He also pointed out negative effects, such as the transfer of investment funds to military expenditure. His study has been criticized for the simplistic nature of its econometrics, which is based on a very basic description of the effects of military on growth (Deger, 1990). In particular, it does not model the displacement effect of military spending.

Subsequent studies have disaggregated the data more fully. Findings have varied, but there has been a general tendency to draw negative conclusions about the impact of military expenditures on development, since adverse effects outweigh favorable ones. Deger's study, for example, concludes that defense expenditure has a negative effect on growth, basing this conclusion on a cross-sectional analysis of 50 countries for the period 1965-1973. In a system of simultaneous equations, he concludes that the impact of such expenditure is negative with respect to saving, growth and the trade balance. High levels of defense expenditure are associated with low rates of saving, which causes low rates of growth, and this effect more than offsets the direct (positive) impact of military expenditure (Deger, 1986).

According to other studies, the impact of defense expenditures depends on the alternative use that could be given to these resources. There does not seem to be any systematic relationship between military expenditure and unemployment, inflation or the balance of payments. In each observed case, this relationship was the result of various effects operating on supply and demand in different ways. Any benefits attributed to military expenditure can be obtained by more efficient means; thus, defense spending can promote growth if it displaces private or public consumption, but its impact on growth will be negative if the alternative use of the funds is private investment or reasonably efficient public expenditure on infrastructure. The rate of saving can be influenced by military expenditure in different ways: reduced public

saving, pressure on the current account caused by reduced saving of foreign exchange, or a fall in the private propensity to save because of increased consumption to make up for a reduced public supply of services (Seiglie, 1998). The impact of PME on growth will therefore vary according to time and place (Hewitt, 1991b).

Another approach – more microeconomic in nature – for investigating the impact of military expenditure is to examine its composition, focusing on long-term resource allocation. To do this; it is necessary to measure how and by how much does military expenditure increase private productivity. In particular, efforts have been made to evaluate the effects of military expenditure on capital formation and resource allocation. The positive effects of defense spending in the short term do not necessarily result in high levels of capital formation or increased long-term output, since military expenditure has a negative effect on each of these variables (Knight, Loayza and Villanueva, 1996). Increased military expenditures can reduce the stock of resources available for alternative uses, such as investment in productive capital, education and market-oriented technical innovation. Moreover, such expenditure normally increases external indebtedness and changes the composition of investment, making it less productive.

Other studies model the structural functioning of the economy. In one of these studies, growth of output is regressed on increases in exports, population and total capital (thus reflecting possible deficits in foreign exchange, labor or capital), changes in flows of external saving, the level of per capita income, and military expenditure. With this model, the coefficient quantifying the impact of military expenditure on growth is consistently negative (Faini, Annez and Taylor, 1984).

In the event of armed conflict, the effects include widespread destruction, devastation and dislocation of population, simmering and escalating tensions, disabling injuries and loss of human lives and assets (Mendes, 1999). Defense can help to prevent this from happening, but it can also intensify its results or increase the possibility of such conflict. A special case is that of land mines. According to United Nations estimates, there are some 110 million antipersonnel mines scattered across 64 countries. The Ottawa Convention, which forbids the production and deployment of mine, has been ratified by only 40 countries.

Notwithstanding the potential adverse effects of military expenditure, its economic allocation is not entirely counter-productive or unproductive. The question is whether it represents the most efficient form of public expenditure for achieving the desired objectives. The opportunity cost of military expenditure corresponds to three categories: the government can increase its total expenditure, which will generally lead to lower levels of private consumption; it can reduce social expenditure, which will lead to a deterioration in the quality and/or coverage of social services, or it can cut down on investments designed to increase national production capacity, such as those in infrastructure and economic services, thus reducing economic growth (Hewitt, 1991a).

The small peace dividend in developing countries

Prior to the 1980s, huge military expenditures by industrialized countries, together with high interest rates, imposed a continuous burden on debtor countries, and absorbed savings that could otherwise have been used for investment or economic assistance in Eastern Europe and in developing countries, or as a means of domestic expansion (Kaldor, 1991). During the last 25 years, there have been 125 wars and other conflicts in developing countries, causing 40 million dead (McNamara, 1991).

The global reduction of military expenditure has been labeled the “Peace Dividend”. It may be envisaged as freed resources: if the 1990 rate of military expenditure had been maintained, military expenditure in 1997 would have increased by US\$ 357 billion. In fact, it decreased by US\$ 117.8 billion. However, it should be noted that developing countries did not contribute to this result, for military expenditures of LDCs rose US\$ 22.2 billion during the same period (see table 4).

Global decreases in military spending appear to be coming to an end. The 1999 United States budget included the largest increase in military spending since the Cold War buildup under President Reagan. But the arms trade, according to the United States Congressional Research Service, was US\$ 23 billion, less than the value of trade recorded at the beginning of this decade.³

Direct effects on production

The direct economic linkages involving defense spending in developing countries differ from those in the industrialized countries. Developing countries import most of their military equipment, and the possibility of beneficial economic effects is very limited. Inter-sectoral linkages are weak, and multipliers, as a consequence, are low. Military expenditure on local goods and services is relatively small and highly concentrated on personnel. There is little possibility of technological spillover effects.⁴

Arms production is highly concentrated in a few developing countries, with India and Israel manufacturing more than half of the weapons produced by these countries. Numerous case studies indicate that there has been little spin-off from the arms industry to the civilian sector. Rather, arms industrialization has caused human capital to move away from directly productive activities (Deger and Sen, 1983; Franko-Jones, 1992; Moon and Hyun, 1992).

Israel elected to develop an R&D-based industry, composed of small and medium-sized companies. It is a focused model with potentially high payoff. In South Korea, there is an ongoing debate on the future of the defense industrial base. The debate involves not only the cost and benefits associated with direct purchases vs. co-production, but the extent to which South Korea's industrial sector should get involved in the development of critical components such as avionics, sensors and munitions.⁵

In 1996, Latin America's arms imports reached their highest level since 1991, and were almost twice those of 1994 (International Institute for Strategic Studies, 1997). During 1997 these imports reached nearly US\$ 2 billion (IISS, 1998). Imports of artillery ammunition reached US\$ 117 million the same year (*Jane's Defense Weekly*, 1999). The leading importers of principal conventional weapons for the 1991-1995 period were Chile (US\$ 1,037 million), Brazil (US\$ 762 million), Argentina (US\$ 600 million), and Venezuela (US\$ 492 million) (SIPRI, 1997).

Military expenditure is accompanied by a number of negative externalities. Rent-seeking activities are concentrated in military expenditure because it is often

allocated in a non-competitive way. The confidential and strategic nature of defense management can aggravate distortions that reduce resource allocation efficiency, thus lowering total factor productivity. Since military expenditure is not subjected to market forces, it tends to distort relative prices that become a dead weight on overall productive capacity.

Capital expenditure in the defense sector may have productive uses, given the need to improve infrastructure in developing countries in order to foster growth. Benefits may flow from the transport and telecommunications system required by military activities, as illustrated by the examples of the Transamazônica highway in Brazil and the Carretera Austral which has opened up the south of Chile. Such benefits are less common than one might imagine, however, since infrastructure designed exclusively for military use does not have any spillover effect on civil activities, while if the infrastructure is designed for use by the civilian sector there is no reason to classify it as military expenditure.

It is claimed that expenditure on military training in developing countries can contribute to improvements in the educational level and discipline of the labor force. There are opposing views, however, which maintain that the military sector is not a significant source of skilled technical resources in developing countries. Many of the skills taught on military training courses relate specifically to the handling of weapons, and skills which might be useful militarily are not easily transferred to other sectors (Ball, 1990).

With regard to military production of goods and services, governments tend to subsidize armaments industries, which, like other subsidies, represents an inefficient use of resources, and the contribution of such activities to the economy is probably negative (Hewitt, 1991b). In this case, general arguments for public enterprises operating in monopoly sectors apply with regard to the principle of subsidiarity, the resulting social utility, and public financing and management capacity.

Estimates of military expenditure

Broadly speaking, public military expenditure corresponds to the total expenditure associated with the provision of defense. It should include labor, operational and maintenance costs, acquisition of war material, military research and development, military construction, military pension outlays, secret defense

spending, contributions to international military institutions, civil defense (if its purpose is mainly military), military intelligence, military health and educational institutions, military aid to other nations, and civilian-military programs in which the defense aspect prevails. The indirect costs may be very considerable, as in the case, for example, of tax and tariff concessions granted to defense-related industries.

On the other hand, military expenditure often finances activities of a civil nature, which should be excluded from accurate accounts of defense spending. Such is the case of banks, public media, and export firms, among others. Military real estate has high maintenance costs which often are unrelated to defense functions.⁶

Information sources and problems

There is an information problem regarding military expenditure, which is due largely to the confidential nature of much of the activity related to such expenditure. Definitions vary, and there are “gray areas”, for example between public security and defense and between operational and social security expenditure. Moreover, by its very nature military expenditure is less open to public scrutiny and can be “submerged” in a number of different items.

Information on military expenditure typically leaves out international arms purchases, while other items sometimes appear under other headings; military hospitals under health, military schools under education, subsidies for defense industries under economic development, and so forth.

Quite frequently, the reported annual expenditure is only the same as or less than actual imports of arms (when verifiable figures exist for the latter), or else various forms of “creative accounting” are practiced, as for example to cover up expenditure or tone down the figures for outlays. Thus, there are items of expenditure which are not specifically reported, such as indirect costs and industrial subsidies and debts related to armaments. Military expenditure accounts often do not include statements of net worth, which register the value of the assets involved.

As noted in a document prepared by the OECD, “the obscurity that surrounds statistics on the national defense spending of the developing countries is an obstacle to the establishment of a constructive dialogue on international security policies and makes it very difficult to assess the appropriateness of the allocation

of resources between civil and military expenditure” (Herrera, 1994). Greater transparency of data on military expenditure is certainly a precondition for any improvement in the security environment through regional policy dialogue. In particular, disaggregated time-series data on defense spending are essential for an understanding of the mechanisms of defense and development. A first initiative, limited but useful, could be to produce a detailed manual on methodology and actual methods of calculation (Berthelemy, McNamara, and Sen, 1994).

The United Nations Department of Disarmament Affairs has made several appeals for the improvement of international data on national expenditure in this field (United Nations, 1983). The accounting procedures regarding PME should be improved in order to standardize the way military accounts are presented both at the national and international levels, including the World Trade. This objective could be furthered by effective fulfillment of the need to register military expenditure and conventional weapons. A considerable number of Latin American countries have signed the United Nations Armaments Register, but only five of them have put registration into practice. This Register includes fighter aircraft, missiles, warships, military vehicles and large caliber artillery. In a recent bid to curb the flow of small arms into war zones, a group of arms experts, commissioned by the United Nations, has recommended the creation of a regional arms register on ammunition and explosives and the expansion of the United Nations Register to include small arms and light weapons.⁷

The Organization of American States (OAS) approved the Inter-American Convention on Transparency in the Acquisition of Conventional Weapons in May 1999. Member states must report weapons exports and notify the incorporation of weapons within 90 days.

Data in this paper

In view of the need to use a set of data which is as homogeneous as possible in conceptual terms and which, at the same time, covers a reasonable period of time for making inter-temporal comparisons, the present study uses information from the government statistics that countries provide to the IMF. The

primary data were organized to make it possible to prepare PME indicators that are compatible with other variables such as gross domestic product, total government current expenditure, government spending on education and health, and per capita expenditure expressed in a common currency. Except for the indicator of military expenditure in relation to expenditures on education and health, the other indicators for the set of countries for which information was available were weighted by the GDP expressed in 1996 dollars. Because of the lack of suitable price indexes representative of military expenditure, the global GDP deflator was used to construct the respective indexes. The information on Cuba and Peru was obtained from the publications of the International Institute for Strategic Studies. Whenever possible, this information was used in line with the same standardization criteria applied to the information from the other countries.

Decrease of world military expenditure

World military expenditure in 1998 amounted to roughly US\$ 745 billion (SIPRI, 1999). This expenditure forms a relatively high proportion of the world product, although it has undergone substantial changes in recent years. Up to the mid-1980s, PME represented between 5% and 6% of the world product (Hewitt, 1993). With the end of the Cold War and the reduction in military aid, world military expenditure began to decline, reaching 2.3% of world product in 1997 and 1998.

Defense spending represents 10.5% of total public expenditure, compared with 14% in 1990 (Gupta, Schiff and Clements, 1996) (table 1). The developing countries share of world military expenditure was 7% in 1960, 11.3% in 1970 and 17.4% in 1980 (Sivard, 1987).

Towards the end of the 1980s, the industrialized countries were responsible for 57% of military expenditure, while the developing countries accounted for 14%, a higher proportion than their share of world product (Bayoumi, Hewitt and Symansky, 1993). Developing countries imported more than 70% of all internationally traded arms between 1972 and 1988. These imports represented 7% of their countries' total imports. Latin American and the Caribbean arms imports represented 7% of their world imports and 3.3% of the region's total imports (Hewitt, 1991a).

Table 1. Military expenditures weighted by country GDP

	As percentage of GDP						As percentage of total public spending					
	1990	1993	1995	1996	1997	1998	1990	1993	1995	1996	1997	1998
<i>All countries</i>	<i>3.5</i>	<i>2.8</i>	<i>2.4</i>	<i>2.4</i>	<i>2.3</i>	<i>2.3</i>	<i>14.1</i>	<i>11.6</i>	<i>10.5</i>	<i>10.6</i>	<i>10.6</i>	<i>10.5</i>
Advanced economies	3.3	2.8	2.4	2.4	2.3	2.3	13.9	11.6	10.3	10.4	10.4	10.3
Industrial countries	3.3	2.7	2.3	2.3	2.3	2.3	13.6	11.3	10.0	10.2	10.2	10.1
Newly industrialized Asian economies	4.1	3.8	3.5	3.7	3.7	3.7	24.5	20.9	19.4	18.9	18.6	16.5
Developing countries	3.0	2.6	2.5	2.3	2.3	2.4	13.4	12.3	12.5	11.7	11.8	11.8
Africa	3.3	3.0	2.7	2.5	2.4	2.4	11.7	9.8	9.3	8.9	8.6	8.5
Asia	2.4	2.0	1.8	1.7	1.7	1.7	11.9	11.9	12.3	11.4	10.9	10.5
Middle East ^{a/}	8.1	6.5	6.4	6.3	6.5	6.6	24.9	18.4	21.1	19.5	20.4	21.2
Western Hemisphere	1.2	1.2	1.3	1.2	1.3	1.2	7.0	7.2	6.8	6.2	6.8	6.7
Countries in transition	6.0	3.1	2.5	2.4	2.4	2.4	16.1	10.5	9.8	9.7	10.7	10.4
Central Europe	2.3	2.3	2.2	2.1	1.9	1.9	11.6	6.7	6.7	6.8	6.5	6.8
Former U.S.S.R.	6.9	3.8	2.7	2.6	2.7	2.9	16.6	16.1	13.1	12.2	14.3	15.1

Source: IMF Survey, May 18, 1998 and June 14, 1999,
a/ Includes Cyprus, Malta, and Turkey.

Table 2. Latin America and the Caribbean: military spending
(US\$ billions of 1998)

1990	16 508.5
1991	16 547.9
1992	17 748.1
1993	18 805.1
1994	21 320.1
1995	22 870.1
1996	23 572.3
1997 ^{a/}	26 704.8
1998 ^{a/}	26 503.2

Source: ECLAC estimates on the basis of IMF statistics.
a/ Preliminary figures.

Resilience of defense spending in Latin America and the Caribbean

According to the most conservative estimate, based on official information on defense expenditure for those countries where it is available, the share of military expenditure in central government expenditure in the Latin American and Caribbean countries averaged 9.5% in the mid-1990s and 7.6% in 1996. It has decreased the least in the world (table 1). Regional PME averaged US\$ 26.6 billion in 1997-1998, ten billion higher than in 1990 (table 2). This amounts to 1.3% of regional GDP (table 3), compared to 2.2% in 1985-1987 and 1.8% in 1989-1990.

Military expenditure is lower in Latin America than in the other developing regions, both as a percentage of GDP and in relation to central government expenditure. It should be noted, however, that the level of armed conflicts is also lower in this region. On the other hand, Latin America and the Caribbean is the only region of the world whose military expenditure maintained the same level, as a percentage of GDP, between 1990 and 1998 (table 1) and it registered the highest increase

between 1990 and 1997 (table 4).

In 1995 the armed forces of Latin America and the Caribbean consisted of almost 1.5 million persons, including permanent staff and conscripts, an increase of 6.5% over 1985 (IISS, 1997).⁸ Military permanent staff grew as fast as or faster than public employment which, as a share of non-agricultural employment in the region, fell from 15.3% in 1990 to 13% in 1996 (ECLAC, 1998). Overall defense spending is projected to reach more than US\$ 262 billion — of which US\$ 80 billion will be spent on procurement — over the next 10 years, according to a 1998 study.⁹

These preliminary results indicate that disarmament has not produced dividends in Latin America, in spite of the peace agreements signed in Central America and the virtual absence of military conflicts in the region. There was no peace dividend for the region. These data also show that public military expenditure should not be ignored in analyses of public expenditure. It is necessary to initiate a debate on its impact, as well as its efficacy and efficiency.

Table 3. Indicators of public military expenditure for selected Latin American and Caribbean countries
(Percentages)

Countries	As a percentage of gross domestic product		As a percentage of central government expenditure	
	1990-1995	1996-1998	1990-1995	1996-1998
Argentina	1.5	1.2	9.0	7.2
Bolivia	2.5	1.9	9.5	7.6
Brazil	1.2	1.3	4.2	4.0
Chile	3.3	3.1	13.2	12.2
Colombia	2.0	2.6	7.5	8.7
Ecuador	2.1	1.9	10.9	10.0
El Salvador	1.8	0.7	13.2	5.2
Guatemala	1.1	0.8	14.7	16.9
Jamaica	0.5	0.4	3.9	4.0
Mexico	0.4	0.4	3.2	3.9
Paraguay	2.2	1.5	21.3	9.6
Dominican Republic	0.7	0.6	3.9	4.0
Uruguay	1.8	1.8	6.7	5.0
Venezuela	1.8	1.8	11.5	8.6
Average	1.6	1.3	9.5	7.6
Weighted average	1.3	1.3	6.0	5.3

Source: ECLAC estimates on the basis of IMF statistics.

a/ Preliminary figures.

Table 4. Variation in military expenditure, by regions, 1990-1998
(Billions of US\$)

	1990-1995	1995-1997	1990-1997	1997-1998 ^{a/}
<i>All countries</i>	-99.5	-18.3	-117.8	-15.3
Advanced economies	-10.3	-30.7	-41.0	-10.6
Industrialized countries	(-21.3)	(-33.8)	-55.1)	(-4.3)
Recently industrialized				
Asian economies	(9.8)	(2.3)	(12.1)	(-6.4)
Developing countries	12.5	9.7	22.2	-1.3
Africa	-2.3	-1.2	-3.5	-0.3
Latin America	7.9	4.0	11.9	-0.1
Asia	8.5	2.9	11.4	-1.9
Middle East b/	-1.5	4.0	2.5	1.0
Countries in transition	-101.7	2.8	-99.9	-3.3
Former U.S.S.R	-97.7	3.6	-94.1	-4.0
Central Europe	-4.0	-0.9	-4.9	0.6

Source: *IMF Survey*, May 18, 1998 and June 14, 1999.

a/ Preliminary figures.

b/ Including Cyprus, Malta and the European part of Turkey.

The political economy of defense spending

The elusive nature of the good (defense) which military spending is supposed to provide and the discretionality of military budgets allows numerous factors - endogenous and exogenous, objective and subjective - to influence the choice of the level of expenditure.

Defense and individual utility

The optimum expenditure on a public good is that which equalizes the marginal willingness to pay through taxes with the marginal cost of producing the good. This means that the level and composition of the budget should be based on the aggregate demand for defense and other government goods, in conjunction with data on technical costs. Whether or not the government chooses policies that reflect the will of the people depends, however, on the effectiveness of the political decision-making mechanisms. Moreover, social demand for government goods is only significant

when the preferences of consumers are reasonably exogenous to the political process and citizens as consumers are sufficiently well informed to voice their preferences for various items of public expenditure (Hewitt, 1991b).

It is difficult to estimate the impact of military expenditure on individual utility. The relation between military expenditure and defense benefits is a matter open to discussion. The biggest points of disagreement concern the danger of invasion, the usefulness of military expenditure in preventing invasion, the defense value of optional systems of arms, and the degree to which military expenditure promotes other national objectives. Moreover, the public has very little information about the level and composition of public military expenditure. In view of this severe lack of information, it is by no means clear that the popular perception indicated by public demand is relevant in determining the optimum level of military expenditure (Hewitt, 1991b). One way to relate military expenditures to individual preferences would be to approve a special withholding tax, like the Social

Security tax, designed to finance defense spending (Gold, 1981).

A public choice framework

The complex political economy of a government determining the amount of resources to allocate to defense can be examined with the aid of Hewitt's model (Hewitt, 1993), in which political leaders maximize their own utility within a public choice framework. The leaders' utility takes into account the preferences of the citizens to varying degrees, depending upon the political institutions of each country. The leadership faces economy-wide budget constraint, foreign financial constraint, and a revenue constraint. The leadership of the country has to make two budgetary choices: (a) the size of the budget and therefore the ratio of private versus public use of resources in the economy; and (b) the mix of government expenditures between the military and other uses. The two decisions are simultaneous and interrelated.

The solution to this model is a system of simultaneous equations. In the first equation the ratio of military expenditures to GDP is the dependent variable and the explanatory variables are the ratio of central government expenditure to GDP, GDP, population, the level of foreign financing, geographic variables and political variables, including the existence of war and the type of government. Central government expenditures and the financial variables are expected to have a positive effect on military expenditures, since they increase the overall availability of resources. The impact of GDP and population is uncertain since offsetting tendencies exist. Because of the public good nature of defense, one could expect the ratio of military expenditures to GDP to fall as GDP and population rise. However, larger countries are more apt to be major regional or global military powers, so a positive association could exist. The geographic variables are included as indicators of cost factors of defending a nation. The political variables are included as rough approximations of political institutions in different countries. Obviously the presence of war will increase the demand for military expenditures. Finally, it is hypothesized that a country run by a military government will place greater emphasis on military security.

In the second equation the ratio of central government expenditure to GDP is the dependent variable, whose value is determined by the ratio of military expenditures to GDP, a development index, and the availability of external financing. Military expenditures are expected to have a positive influence on central government expenditure. The development index is meant to be a proxy for the ability of the government to raise revenues and its coefficient is therefore expected to be positive. Availability of foreign finance is expected to have a positive effect on government spending for essentially the same reasons.

Hewitt found that financial variables do explain variations in the level of military expenditure across time and across countries. In the first equation the elasticity of military expenditures with respect to central government expenditure is positive and significant, though much less than unity. This implies that increases or decreases in the share of resources allocated to government leads to a less than proportional change in military spending.

In the second equation, increased military spending in most cases leads to higher central government expenditure. The coefficient on population is also positive. The elasticity of military spending with respect to per capita income is less than unity. As per capita income increases, military spending also increases, but by a lower percentage. The net flow of public and publicly guaranteed foreign financing has a positive and significant coefficient in the central government expenditure equation. Thus, this variable is still found to have an indirect positive effect on the military expenditure to GDP ratio.

With regard to the effect of the political variables, the benchmark is a democratic government not engaged in conflict. The most significant coefficients are associated with international and civil war. Next in order of importance are monarchies, other forms of government and military governments. The leadership of non-democratic countries tends to prefer larger military expenditures than does the population as a whole. The policies of countries ruled by democracies reflect the more closely the preferences of the population at large, while with other regimes policies are more likely to reflect the preferences of the leadership. Among the geographic variables the strongest result is that a larger coastline induces greater military spending. The same holds for land borders, but the results are slightly weaker. The effect of land area on military expenditure is uncertain.

According to Hewitt, this model explains 55% of the variation of the ratio of military expenditure to GDP, and military expenditures rise nearly in proportion to GDP. Since 45% of the variation is left unexplained, country specific historical and political circumstances no doubt exert considerable influence. Otherwise it is difficult to explain the large inter-country differences observed in the levels of military expenditure, once these are normalized by GDP, population or territory (table 5).

The economic situation does not provide a simple explanation of the dynamics of military expenditures (see figure 1). In real terms, defense spending within Latin America and the Caribbean grew at an annual average of 3.7% per annum from 1972 to 1998, which was slightly above the rate of increase of the region's GDP. The correlation coefficient between military expenditures and GDP for this period was 0.854. As

the graph shows, GDP growth increased steadily, while defense spending does not show a constant pattern. Three sub periods can be identified throughout these years.

From 1972 to 1980 both indexes show an increase, although military expenditures grew 8.6% and GDP only 5.5%. For the 1981 to 1990 period, the GDP index shows zero growth from 1980 to 1984, while the defense index increased by 2%. From 1985 to 1990, when *de facto* regimes were replaced by democratic ones in most countries of the region, defense spending decreased by 1.5%, while GDP grew 1.7% annually. Finally, from 1991 to 1998, GDP maintained the previous growth pattern, while defense expenditures started to grow again. From 1990 to 1998 the annual average growth rate of defense spending was 4.7%, while GDP growth was 3.6%. During the last two years of this period, military expenditures have grown much faster than regional GDP.

Table 5. Indicators of public military expenditure and size of armed forces, for selected Latin American and Caribbean countries 1997-1998 ^a

Countries	Per capita public military expenditure, 1998 (Dollars)	Size of armed forces, 1997	
		Military personnel per 1 000 inhabitants	Military personnel per 1 000 km ²
Argentina	112.2	2.0	2.6
Bolivia	19.1	4.4	3.0
Brazil	66.7	1.9	3.7
Chile	151.2	6.4	12.4
Colombia	64.1	3.6	12.8
Cuba	...	5.4	52.4
Ecuador	28.6	4.8	20.3
El Salvador	13.6	4.7	135.2
Guatemala	12.2	3.9	37.6
Jamaica	8.7	0.4	30.0
Mexico	16.3	1.9	8.9
Paraguay	27.3	3.9	5.0
Peru	55.7	5.1	9.7
Dominican Republic	9.5	3.1	50.3
Uruguay	104.4	8.0	14.5
Venezuela	88.5	2.5	6.1
Total average	51.9	3.9	22.0
Weighted average	57.0	2.7	6.2

Source: ECLAC calculations, on the basis of statistics of the International Institute for Strategic Studies, 1998.

^a Preliminary figures.

Source: ECLAC estimates based on IMF and SIPRI statistics.

Actors

Those who influence the allocation of PME and define its size and content generally use other types of criteria in addition to economic ones. Consequently, the direct economic impact of such expenditure, as well as the positive and negative externalities that it generates, do not explain defense expenditure decisions by themselves. Demands for increased military budgets occur for any of a number of reasons: national prestige, pressure from armed public employees, the personal eagerness of decision-makers who want to go down in history as “modernizers” of the armed forces, or receipt of tempting offers from arms suppliers. Self-interest influences legislators, military bureaucrats, think tanks on military matters, and lobbyists and corporate leaders. The corporative interest of the military sector and the personal motivations of those responsible for making decisions can be of decisive importance.

From the point of view of strategic behavior, decision-makers’ expectations may result in regional or subregional actions and reactions, which give rise to purely reactive military expenditure. Expectations can also result in opposite effects: for example, a moratorium on the purchase or sale of arms - at the regional, subregional or bilateral level - would bring about a reduction in military expenditure.

Interactive decision theory concerns the behavior of decision-makers whose decisions affects each other. One of the areas where game theory finds the most applications is that of tactical and strategic military problems. It cannot be assumed that the resources and preferences of individuals (or of military institutions) are known to competitors. It is therefore necessary to include considerations about personal beliefs with regard to the status of competitors, as well as about the learning process that takes place over time.

Beginning in 1965, research sponsored by the United States Arms Control and Disarmament Agency has focused on the study of infinitely repeated games with incomplete information. These include strategic equilibrium, dynamic games played with some kind of stationary time structure, stochastic games, repeated games with or without complete information, the Prisoner's Dilemma, the axiomatic approach, where one does not define a solution directly, but rather writes down a set of conditions to be satisfied, to see where they lead, games with asymmetric information, games with many players, and situations of bounded rationality, where not all alternatives can be considered by the players .

Concern now turns increasingly on the needs for and methods of collaboration among allies, for example on how to promote the viability of the alliance networks so arduously built up over the Cold War era, how to share resource allocation burdens and strategic decisions in an era of increased interdependence, and how to harmonize security interests with the rising interdependencies which spring from trade growth, resource scarcities, and shifts in the technological basis of national power (McGuire, 1998).

Technological developments

Demands for a larger military budget can also rise from the fact that technological advances impose minimum levels of military expenditure if a country is not to "lag behind" in the arms race. The technological pressure for increases in military expenditure is constant and seems to become ever more acute. Technological change raises other issues in regard to defense. In perhaps no other sphere of human activity is there such a high rate of creation of new technologies designed either to retain strategic superiority or not to lose ground to rivals (Pivetti, 1992). Equipment obsolescence is less predictable in the military than in other sectors. As in the health sector, there exists the possibility of an increasing-cost trap where supply considerations are paramount.

The cost of a total attack with survivors or of a total defense with survivors has increased to an extraordinary extent for technological reasons, so that it would be very difficult for the developing countries to bring their military technology up to the level of the industrialized countries. However, according to the CIA's National Intelligence Estimate for 1999, any country, regardless of its missile development experience, could field an intercontinental ballistic

missile (ICBM) by the year 2015. The missiles could be produced domestically or purchased in international markets.¹⁰

Although it seems odd, cooperative solutions are increasingly important for military lines of production. Transnational procurement of national defense items is increasingly common. For the defense industry, domestic markets have shrunk with the end of the Cold War, resulting in serious excess production capacity. Exports provided a solution in the past for excess capacity, but demand for weapons has also fallen in the developing world, so total sales are stagnant. But the defense industry is not governed by normal, competitive forces: plants that would be otherwise forced to close, either by bankruptcy or by post-merger consolidation, are kept open by aggressive lobbying, circumventing the market mechanism. The problems for traditional defense companies are compounded by the fact that technology is altering the fundamental nature of their business. They increasingly find it necessary to incorporate into their products off-the-shelf components developed for purely commercial use, especially in information technology and computing. This raises the prospect of the emergence of a new set of commercially orientated, high-technology providers of next-generation military equipment.

Arms suppliers

The policies of arms suppliers are also important in determining the level and composition of public military expenditure. In the period from 1992 to 1995, total arms exports to Latin America reached US\$ 860 million, of which 30% were supplied by firms in the United States and 25% by firms in the four main European export countries (Lumpe, 1998). Restrictions on the sale of United States war material to the region were lifted in 1997. One South American country was designated “principal non-NATO ally” by the United States; the same country then asked to be admitted to NATO, but this petition was rejected. Thus far, exporting countries have often set the rules-of-the-game, either by providing sales on especially favorable terms or by imposing selective or blanket embargoes. Importing countries should set their own guidelines for arms purchases, which could serve as a containment exercise.

Military assistance normally leads to an increase in PME, even when it is provided at no cost to the recipient. Public external credit, or external credit with public guarantees, also encourages military spending, by increasing the resources available to governments.

In Europe, defense contractors must seek economies of scale by shared development. Otherwise, they will be obliged to rely increasingly on the United States for high technology weapons. Six European governments (France, Germany, Italy, Sweden, Spain and the United Kingdom) have put pressure on aerospace and defense companies to unite into a pan-European group that would include missiles and helicopters, and perhaps other weapons system, in addition to aircraft.¹¹

Significant results are yet to come, however. One of Europe’s most ambitious collaborative projects, the Horizon, a three-nation naval frigate project, collapsed after the United Kingdom withdrew from it.¹² On the other hand, in December 1994, four Nordic countries agreed to form up to 20 working groups to examine different procurement projects ranging from submarines to ammunition. This common procurement package could cover up to 80 helicopters over the next 10 years.¹³ Interoperability is a significant issue for NATO. Common standards and designs for national forces must be put in place so country networks and weapons systems can operate together.

International donors and international financial institutions cannot ignore the fungible nature of such financing, which can be directed toward military expenditures. A case can be made for making such loans conditional on restricting defense spending (Deger and Sen, 1992).

Design, management, and evaluation of defense policies

Defense policies may be viewed as part of a principal-agent relationship: in general, it is a privileged form of public expenditure which is not discussed openly, in contrast with traditional public finance, and its effects are often observed only in the long term.

Nor is defense managed in a transparent manner, since there is no public discussion regarding its efficiency and efficacy, or least no discussion comparable to that which is possible for other types of public expenditure. Nor is there discussion of the impact of defense spending on social well being, both directly and relative to other public expenditure.

Design of defense policies

It is worth noting that the allocation of military expenditure in industrialized countries is often judged to be inappropriate, for reasons of both supply and demand, and the same is no doubt true for developing countries, where even less is known about the defense budget.

In industrialized countries, it is quite normal that there should be legislative debate about defense matters.¹⁴ In the United States, the budgetary process of Congress is divided into two parts, the first granting technical authorization to carry out projects, and the second allocating the funds required for approved projects. The whole process takes about nine months and favors high-level civilian management of defense.

There is a dearth of civilian experts on military expenditures in Latin America and the Caribbean, a fact that allows the military to dismiss criticisms as unfounded. The design of public policy for defense is thus made difficult, and the difficulties are often compounded by language barriers. In the Latin American countries, legislative analysis of the military budget is rare, for this requires agreement between government and the military establishment. However, a Application of economic analysis to the management of military spending could be beneficial both for fiscal and military leadership. This requires the extension of economic methods into decisions as to the size, equipment, deployment and support of military forces, all of which would inject defense economics into military planning. This would require: (1) new, comprehensive, system-wide definitions of costs and benefits; (2) quantification of benefits and costs and reduction thereof into real values; (3) a search for - and comparison between - alternative programs/systems to achieve measurable goals; (4) calculation of cost minimizing force compositions, based upon trade-offs among components with (5) multi-year decisions based on present values calculations; and (6) a growing appreciation of adversarial reaction as an active component in defense analysis (McGuire, 1998).

The management of military expenditures could benefit from the general application of modern methods such as electronic data processing, outsourcing, licensing, and the use of concessions. In other types of public expenditures, these techniques have resulted in increased specialization and efficiency gains. Similar savings are expected for military expenditures.

recent trend toward an analysis of military expenditures on their own merits is evident (IISS, 1998). Some countries have established floor or minimum levels of PME based on income from sales of non-renewable natural resources. In Chile, for example, the armed forces are guaranteed, by a constitutional-level law, 10% of the sales of the Chilean Copper Corporation (CODELCO), while Ecuador reconfirmed, in 1995, that 15% of its petroleum income will be allocated to the military for another 15 years (SIPRI, 1998).

Management of military expenditure

Defense microeconomics. Microeconomic analysis of military expenditures was furthered by techniques developed by The Rand Corporation in the United States. Secretary of Defense Robert McNamara put these techniques into practice during the early 1960s, especially with regard to the appropriate level of defense spending (how much is enough?), its opportunity cost (what are its direct and indirect economic impacts?), and its cost-effectiveness as a system of acquiring arms (what is its effect per monetary unit of expenditure?).

Government procurement of military supplies is particularly opaque. There is widespread concern

about corruption in imports of military and military-related equipment. The same is true for domestic military procurement. There is a pressing need to subject the financing and acquisition of military equipment to standard regulations (Navarro Meza, 1997). There is, in addition, a need to regulate the use of military assets, for these are typically subjected to more liberal and less transparent rules than those applicable to other public assets.

With regard to state-owned military enterprises some general regulations are necessary. Governments ought to specify clearly their productive activities, as well as their investment policy. The accountability of their managers should be established in performance agreements or management contracts. At the same time, alliances with the private sector should be considered, or even the privatization of some firms. Spain, for example, is privatizing the government-owned electronics firm INDRA, which derives approximately 40% of its revenues from military sales.¹⁵

Private management techniques. Several industrialized countries have put private management techniques into practice, although specific modalities for the military sector are often debated. There is widespread agreement on the desirability of contracting out the production of goods and services which are not vital to the defense function (See box 1).

Box 1. Some Examples of Procurement Reforms

NATO

NATO is considering an overhaul of the alliance's sprawling arms planning, logistics, and research work. The result would be the creation of a single, high-level policy-making department at NATO, responsible for joint technology and armaments efforts. The new body would advise NATO's decision-makers on common arms projects, cross-border equipment interoperability and other key post Cold War issues. It is far from clear whether this new committee, once formed, it will be given decision-making authority.

United States

The Pentagon Comptroller proposed that statistical information on weapons be of sufficient quality to stand up to an audit.

Federal acquisition rules are being revised to ensure competition for government service contracts involving more than one company. The Defense Department will select contractors based, in part, on how well the companies performed on past government jobs.

In the Pentagon, the Acquisitions Chief is vested with responsibility and authority for setting the acquisition priorities across all services

The Pentagon has proposed changes to the rules governing commercial firms' management of billions of dollars of government-furnished equipment. Contractors would take ownership of special tooling and testing equipment worth less than US\$ 5,000; all low value items would no longer require individual records, while items costing US\$ 1 million still might require detailed record keeping.

The Defense Department will open more than 200,000 civilian jobs to competition during the next six years. The Marine Corps will allow private companies to compete for nearly half of its 12,000 civilian jobs by 2002. The privatization of the Defense Department's vehicle shipping service for civilian and military personnel has resulted in more vehicles arriving on time.

The Air Force acquisition section has modified the service's procurement processes to improve relations with industry contractors. The first round of reforms resulted in US\$ 30 billion of procurement savings. The new reforms will cut acquisition costs, shorten delivery schedules and lead to acquisitions and product support services that are more responsive to Air Force needs. The same branch has issued requests for private proposals for two depot maintenance workloads: one for maintenance of KC-135 Stratotanker and a second for avionics components repair.

United Kingdom

Procurement strategy is shifting away from an adherence to competitive procurement, clearing the way for the establishment of a large, cross border prime defense contractor that will have a virtual monopoly in Europe. Supply management is expected to replace competition as the primary tool for controlling costs and ensuring quality.

The Minister of Defence has awarded 21 Private Finance Initiative contracts in an effort to attract private cash for public projects. Only contracting out combat-related tasks remains controversial within the armed services.

During the eighties, warship refit and repair was taken by private contractors, which operated the Royal Dockyards, still under government ownership. In early 1997, the two largest naval dockyards were acquired by their operators. In the military aircraft maintenance field the privatization of support services in an increasingly common feature.

New Zealand

The Defense Force intends to focus on leasing a wide spectrum of military equipment, after having reached an agreement with the United States last year. An agreement to lease 28 F-16 fighters for a combined total of ten years was recently reached. At the end of the period New Zealand will have the option to buy the aircraft for US\$ 287 million.

Canada

The military's research and science branch will forge closer links with Canadian defense firms to develop new products and win foreign contracts. But plans to have private industry take over more of the military's secondary support roles in areas such as maintenance have all but stalled.

Europe

European governments are looking to the commercial sector to share and, in some cases, even own and operate tomorrow's military space assets. The concept of using commercial space services to complement military-owned systems is gaining momentum also in the United States.

Source: *Defense News*, various numbers.

Employment. Salaries and retirement payments represent a substantially higher share of military expenditures in Latin America and the Caribbean than in developed countries. Despite its importance, human resources management in the military public sector is still *terra incognita* for outsiders. Military personnel are public employees, but their careers follow rigid rules. Civilian literature on this subject does not exist in Latin America, where policymakers tend to rely on military advice. Nevertheless, personnel management within the armed forces ought to be reviewed. Such a review should include an examination of the possibility of changing the provisions for social security, increasing the retirement age and reducing the number of personnel.

Institutional aspects. In addition to the general problems displayed by the fiscal institutions of the region -including their insufficient political weight, coverage and flexibility - there are others more specific to military expenditure, such as lack of transparency, vague objectives, inefficient arrangements for distributing resources among the different branches, and weaknesses in their functional and staff organization. The predominant institutional framework in the region is that of a ministry of defense. Brazil is the only country in South America which, instead of a single ministry, has three military ministries, established during the military governments which ruled from 1964 to 1985. The current government plans to create a civilian-led Ministry of Defense. In general, existing institutions have been unable to prevent frequent duplication of efforts in military branches that are complementary to each other. The military services should be reorganized to improve their ability to carry out joint operations.

The cutback of military expenditures. Reduction of military expenditure raises specific problems. Changes take time and there are adjustment costs. Transition to a lower level of military spending is often made difficult by the "lumpiness" of multiyear investment in weapons systems.

There may be serious redistributive consequences for those who depend on military or related activities for income. The ease with which a developing economy will absorb the labor force displaced by a reduced military sector depends on such factors as the number of persons displaced and their rate of displacement, their skills, the availability of work and the relation between skills required and the skills of the

unemployed, the rate of job creation, and the effectiveness and coverage of retraining programs. Reductions in military expenditure and the discharge of military personnel have been blamed for the emergence of groups of jobless individuals who engage in unlawful actions and thus increase the insecurity of the population. With regard to military personnel themselves, their transfer to productive activities is not a simple matter and at times is even be impossible. The experience of the former Soviet Union seems to show that there are only limited possibilities for the production of civilian goods by relatively sophisticated military factories (Bayoumi, Hewitt and Symansky, 1993).

Evaluation

Public expenditure in general is not the subject of independent professional evaluation in Latin America and the Caribbean. Military expenditure is no exception to this rule, and it also has special feature of its own. Some argue that it is necessary to keep all information and analysis of military expenditures under the strict control of the military.

Military and non-military expenditures. As with any public expenditure, the marginal social benefit of military expenditure should be estimated and compared with other government expenditures, especially social and economic outlays. In this sense, it would be interesting, for example, to estimate the net benefits which countries like Costa Rica may have achieved through their low military expenditure. However, the methodology required for this is not yet available.

Military spending may well crowd out social and economic expenditures. Available data unfortunately are not adequate for the direct study of military spending dynamics vis a vis that of social and economic spending. Many social expenditures have been decentralized, which is not the case of military expenditures; therefore, they are not comparable at the central government level, which is the only level for which data are usually published.

Keeping this caveat in mind, we note that the proportion of military expenditure in central government expenditure has increased compared with that on

education (from 78% in 1980-1989 to 93% in 1990-1995) but has gone down compared with expenditure on health (from 162% in the 1980s to 116% in the first half of the 1990s). In 1990-1995, the central governments of the countries of the region spent an (unweighted) average of one dollar on defense for every 1.1 dollar on education and every 0.9 dollar on health. These ratios vary significantly from one country to another, since in some countries military expenditure exceeds health expenditure or that on education, and in others it exceeds both of them.

Efficacy and efficiency. Before allocating funds for military expenditure, policymakers ought to question their efficacy (will this expenditure achieved the desired objective?) and their efficiency (could the same effect be achieved with fewer resources?).

Any evaluation of military expenditure should consider its structure, that is, the share accounted for by personnel, equipment, infrastructure and other expenditures. Personnel-related expenditures were 39.3% of total military expenditures in the United States and 42.2% in the United Kingdom during the 1990-1994 period, while in Argentina and Brazil they exceeded 80% of expenditures in 1996 (IISS, 1998).¹⁶ The R&D component of military expenditure amounted to 8% both in the United States and the United Kingdom by the mid-1980s and was much lower in Latin America.

The structure of military budgets in Latin America and the Caribbean makes it difficult to increase efficiency. Personnel expenditures represent the bulk of total spending, and these cannot easily be decreased. In fact, there is pressure to increase them, while the opposite happens with investment and operational expenditures (Soto, Riveros and Giha, forthcoming). Additional rigidity arises from the practice of earmarking expenditures.

Military expenditure can also be evaluated by calculating the ratio of operative or combat personnel to administrative or logistic personnel. Thus it is possible to determine how much a country deviates from international parameters. A case study for Colombia found the ratio to be 1:8 in comparison to an international standard of 1:3 (Soto, Riveros and Giha, forthcoming). This calculation could be refined if equipment quality were taken into account.

But a thorough evaluation of military spending is impossible without appropriate indicators. These should be available from the very beginning of the public

policy cycle, that is, at the design stage. As a first step in this direction, military expenditures could be classified in the same manner as other public expenditure: compensation of employees, use of goods and services, consumption of fixed capital, property expenses, subsidies, grants, social benefits and other expenses.¹⁷

Government reform and reform of defense

The modernization of the design, management and evaluation of defense spending is part of a comprehensive process of government reform. In fact, one reform can further the other.

As the Deputy Defense Minister for Policy of South Korea recently stated, "Military reform and government reform are in the same vein. Past efforts at reform left implementation to the concerned offices and were met with much resistance. However, today we have national and public consensus. Government-level reforms have created a positive atmosphere that will facilitate the Minister of Defense's Program".¹⁸

It is important that military expenditures become a regular part of public spending, subject to public scrutiny and to formal procedures designed to increase their efficiency and efficacy.

Endnotes

¹ For the same year, the NATO figure was US\$ 552; ranging from US\$ 361 for the US and US\$ 777 for Norway, to US\$ 96 for Turkey. Source: NATO Press Release, December 17, 1996.

² Argentina, Brazil and Chile have published "Defense Books".

³ Reported in "El Mercurio", August 9, 1999

⁴ According to a survey of the world's largest defense companies, defense contractors in the United States spent 31% more on R&D in 1997 than they did in 1996. *Defense News*, July 20, 1998.

⁵ *Defense News*, March 5, 1999

⁶ The People's Liberation Army from China owns a commercial empire worth US\$ 6.5 billion, with annual profits one tenth that. *The Economist*, August 5, 1999. Central America's armed forces have taken over banks, hotels, funeral homes, radio stations,

advertising agencies, supermarkets and stores through their pension funds. *The Economist*, June 20, 1999.

⁷ *Jane's Defense Weekly*, August 8, 1999.

⁸ That same year the armed forces of NATO reached 4.7 million. NATO Press Release, December 17, 1996.

⁹ Forecast International, reported in *Latin Trade*, September 1, 1998.

¹⁰ *Jane's Defense Weekly*, May 5, 1999.

¹¹ *Financial Times*, November 7, 1998.

¹² *Jane's Defense Weekly*, May 5, 1999.

¹³ *Financial Times*, July 8, 1998.

¹⁴ See, for example, United States Congress, 1997a and 1997b. These two studies openly and sometimes critically analyze the proposals of the Department of Defense, proposing alternative courses of action to make better use of fiscal resources.

¹⁵ *Defense News*, May 10, 1999.

¹⁶ NATO Press Release, December 17, 1996.

¹⁷ See the new *Manual on Government Finance Statistics* of the IMF, which will replace the 1986 edition.

¹⁸ Interview in *Jane's Defense Weekly*, June 30, 1999.

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PUBLIC SOCIAL EXPENDITURE ANALYSIS

By Albrecht Horn*

Public social expenditure levels and impact assessment

Public expenditure analysis

Public expenditure analysis covers both intersectoral and intrasectoral allocations and impact assessment. The macroeconomic framework provides the basis for the aggregate level of spending and the analysis of the functional and economic composition of expenditures.

The analysis has to focus on the level and composition of public expenditures, their impact on specific outcomes, the distribution of benefits and the options for targeting (Pradhan, 1996). The aggregate level of spending has to be consistent with the macroeconomic framework. The inter- and intrasectoral allocation should scale to maximize social welfare. Allocation decisions have to be based upon the identification and assessment of the needs of government interventions related to specific market failures, the consideration of the public-private rationales and agreed social objectives, such as distributive justice. The impact of the level and composition of spending on specifically defined outcomes has to be measured and expenditure-outcome combinations have to be assessed. This should be supplemented by the analysis of the benefit distribution and the examination of the options for better targeting.

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Classification of Public Social Expenditures

The functional classification in the International Monetary Fund (IMF), *Government Financial Statistics* (IMF) (various) covers, under "Social Services", public expenditures in the health sector, education sector, social security, welfare, water supply and sanitation. These expenditures are allocated to the different levels of government, central, state or province and local. The objective of public social expenditures is to improve society's well being by the collective provision of goods and services.

The United Nations System of National Accounts defines social benefits as current transfers received by households intended to provide for the needs that arise

from certain events or circumstances. The OECD definition is similar:

"Social expenditures is the provision by public (and private) institutions of benefits to, and financial contributions targeted at households and individuals in order to provide support during circumstances which adversely affect their welfare, provided that the provision of benefits and financial contributions constitute neither a direct payment for particular goods or services nor an individual contract or transfer. Such benefits can be cash transfers or can be direct (in kind) provision of goods or services" (OECD, 1996).

Social expenditures can, following decisions on the balance between public and private financing and provision of social services, be broadly divided into public social expenditures and private social expenditures. A further classification can be carried out with regard to specific social policy areas such as education, health, employment promotion, family benefits, housing benefits, sickness benefits, pension benefits, etc. The relevant statistics often refer to gross levels of public social spending for different levels of government. The data do not indicate net outlays because they do not take account of the effects of different tax treatments of social expenditure categories. The calculation of "net public social expenditures" must take account of the method of benefit payment, the tax treatment and the form of transfers. The level of indirect taxes determines the amount of consumption financed from net transfers.

For the analysis of public social expenditure impact on outcomes, further specific classifications are needed.

The broad classification into health, education, welfare/social security and water supply/sanitation is not adequate. For the impact analysis the functional classification of health and education expenditures needs to be subdivided into expenditure by programmes, such as general administration, public health, clinical services, and tertiary care, and pre-primary education, primary education, secondary general education, secondary vocational/technical education, and higher university education. These

* United Nations Department of Economic and Social Affairs. The views expressed in this paper are personal, and should not be taken to represent the views of the United Nations or any of its subsidiary organizations.

different subcategories of public social expenditures within specific sectors can then be related to selected outcomes in each sector such as mortality rates, life expectancy at birth, incidence of diseases, gross school enrolment, net school enrolment, completion rate, etc.

Benefit incidence analysis, the distribution of benefits to certain groups such as different income group, is based on household surveys estimating the average use of public social services. Related public social expenditures are taken as a proxy for benefits received. This leads to comparisons of well-being before and after government intervention. Such comparisons require data on the use of public social services by different income groups, the costs incurred, the valuation of risk reduction, the assessment of health and education outcomes, etc.

Trends and impact of public social expenditures

The analysis of public social expenditures impact includes:

- the determination of the level, composition and trends of expenditures (magnitudes, ratios, time series);
- social impact analysis—assessment of the impact of public social spending on defined sectoral outcomes; and
- the social valuation of specific expenditure-outcome combinations.

Health expenditures. The rationale for public health expenditures as a form of government intervention is the nature of the underlying market failure. Public financed services include public health, basic clinical care and specialized tertiary care. Public health expenditures constitute a set of government interventions that provide specific public services. Market failures in the health sector often relate to information asymmetries concerning the outcome of interventions between providers and consumers. Moral hazard creates problems for the functioning of insurance markets. Governments have to choose adequate interventions in the form of public financing

and public provision, public financing and private provision or regulated private financing and provision.

The decisions include intrasectoral allocation, the determination of specific expenditure levels, the determination of identifiable health outcomes and the cost-benefit evaluation of expenditure outcome combinations. Specific health outcomes related to public health expenditures are, for instance, infant and maternal mortality rates, incidence of disease, resurgence of preventable disease, life expectancy, etc. The relation between the level and intrasectoral allocations of public health spending and specific health outcomes is problematic due to the impact of other factors. Hammer (1995) developed an analytical framework to measure the impact of health expenditures on health outcomes. The principal findings were:

- Public health expenditures should be allocated to such services that the private sector cannot be expected to provide (preventive care);
- The public good characteristics of preventive services make them a focus for public health expenditures with the greatest effects on indicators/outcomes such as infant and maternal mortality; and
- Clinical services are often more effectively rendered by the private sector.

Even given an established relationship between public health expenditures and specific health indicators/outcomes, the valuation of the outcomes poses formidable problems. The so-called “human capital approach” of valuation uses foregone earnings on account of death or illness as the appropriate value. This requires the determination of the impact of diseases on output/productivity and its valuation. The so-called “willingness to pay” approach provides an alternative. The estimates of the willingness to pay for the reduced risk of mortality or morbidity are based on revealed preferences from observed behaviour and contingent valuation studies. Cost-effectiveness criteria are used to select programmes that minimize the costs of meeting a particular outcome. In this regard, the World Bank has identified essential packages of services, including public health and clinical services. However, evaluations reveal that actual allocations differ from recommended patterns (table 1).

Table 1. Proposed allocation (dollar per capita)

Component	Low-income countries	Middle-income countries	All developing countries	Actual allocation all developing countries
Public health	4	7	5	1 - 2
Essential clinical services (minimum)	8	15	10	4 - 6
<u>Total</u> : Public health & clinical services	12	22	15	5 - 7
Discretionary clinical services	6	40	6	13 - 15

Source: The World Bank (1993) and Pradhan (1995).

Cost-effectiveness analysis in terms of minimizing the costs of meeting defined outcomes needs to be supplemented by the assessment of the envisaged outcomes related to broader welfare objectives and the appropriateness of public provision. Relevant analysis undertaken in above-mentioned studies has led to some general conclusions:

- Governments in developing countries spend relatively too much on hospital services with low-cost effectiveness, and on discretionary clinical services and tertiary care.
- Insufficient amounts are spent on public health and basic clinical services. Public health expenditures should be concentrated on financing these programmes. Reallocation towards such programmes will be efficient and equitable, thus reducing mortality and morbidity rates.

Education Expenditures. Education markets are prone to market failures thus justifying government intervention and related public education expenditures. Positive externalities related to education are another reason for public spending in this sector. This seems especially true for primary education. The subprogrammes within the education sector can be divided into primary education (basic literacy and numeracy), secondary education and higher, or tertiary, education.

The allocation of public expenditures across programmes indicates the relative focus (table 2). The allocation is also affected by underlying public-private roles. The impact on specific education outcomes and indicators, such as gross enrolment by level of education and by different socio-economic groups (completion ratios, literacy ratios and qualitative criteria) needs to be evaluated. An additional dimension is the determination of the distribution of benefits.

Principal government objectives in this sector are to provide greater access to and better quality of basic education. The assessment of the impact of public education expenditures on education outcomes has to take into account the intrasectoral allocation as well as the role of the private sector at different levels of education. The public-private mix in the education sector varies widely across countries.

While the share of the private sector in primary education is roughly the same in developed and developing countries, the share in secondary education is higher in developing countries (table 3). Private schools often perform better and are more efficient relative to public schools. This is a result of different management performance rather than of the form of financing. Government financing of education has to take this into account. Government financing needs to supplement rather than substitute for the private provision of education.

Table 2. Public current expenditures on education by level, 1993 (percentages)

Region	Primary	Secondary	Tertiary
Sub-Saharan Africa (22)	41.3	30.5	14.8
East Asia & Pacific (4)	49.3	26.8	15.9
Europe & Central Asia (5)	39.4	28.5	18.4
Latin America and Caribbean (11)	36.0	41.5	16.1
Middle East & North Africa	41.5	30.4	13.9
South Asia	30.7	39.0	20.6

(Note: Unweighted averages. Figures in parenthesis refer to number of countries in the regional sample.)

Source: UNESCO Database, 1994.

Another dimension is the valuation of specific public education expenditure levels and education outcomes. The benefits of education are often measured by the stream of income related to different education levels. These evaluations are based upon age-earning profiles by level of education which serve to calculate the discount rate that equates the stream of benefits to a stream of costs at a given time or the rate of return. The benefit stream is measured by the earning differentials of different education levels. The stream of costs consists of the foregone earnings. To turn private rates of return into social rates of return the additional cost of public subsidies have to be added. Calculations based on this method have been carried out (table 4).

Primary education shows the highest social benefits. Private returns are higher than social returns because of public subsidization of education. The degree of public subsidization increases with the level of education implying a regressive impact. Private and social returns diminish with the level of per capita income.

Recent Studies. The analysis of the impact of public social spending is often hampered by methodological difficulties and the lack of adequate data. A recent study by the IMF compiled a sample for 118 developing and transition countries to evaluate the relationship between public social spending and socio-economic indicators (Gupta, Clements and Tiongson, 1998). The analysis excludes private social spending and its impact. This has the potential to distort relationships between public social spending and specific outcomes, since the outcomes do not separate the impact of public and private spending.

Public expenditures on education and health are an essential part of public social spending because of their positive effects on the formation of human capital, which in turn contributes to economic growth, equity and the reduction of poverty. The effects depend not only on the level of spending but also on the intrasectoral allocation.

General patterns. Public expenditures on education average around four per cent of GDP and 14 per cent of total government spending (figure 1). There is little variation across regions. Public expenditures on health averaged about 2 per cent of GDP and 7 per cent of total government expenditures with greater variations between regions. On average, public expenditures on education and health have been increasing as a share of GDP and total government expenditures. Real per capita spending rose by 0.7 per cent on education and

1.3 per cent on health, respectively. In transition economies public education and health expenditures as

shares of GDP declined.

Table 3. Relative Role of the Private Sector in Education (per cent) 1995

Advanced industrial societies	Private primary	Private secondary
Australia	20	26
Belgium	51	62
Denmark	7	6
England	22	16
France	15	21
Germany	2	9
Italy	8	7
Japan	1	15
The Netherlands	69	72
New Zealand	10	12
Sweden	1	2
United States	10	9
Median	10	13.5
Mean	18	21.4
<u>Developing countries</u>	<u>Private primary</u>	<u>Private secondary</u>
Kenya	1	49
Lesotho	100	89
Sudan	2	13
Cameroon	43	57
Chad	10	6
Liberia	35	43
Niger	5	14
Algeria	1	1
Iran	8	17
Jordan	30	7
Morocco	5	8
Saudi Arabia	3	2
Syria	5	6
Argentina	17	45
Bolivia	9	24
Brazil	13	25
Chile	18	23
Colombia	15	38
Costa Rica	4	6
Ecuador	17	30
El Salvador	6	47
Guatemala	14	43
Haiti	42	76
Honduras	5	51
Jamaica	5	76
Mexico	6	25
Panama	5	14
Paraguay	13	37
Peru	13	37
Venezuela	13	17
India	25	52
Indonesia	13	60
The Philippines	5	38
Singapore	11	32
Thailand	11	32
Median	11	27.5
Mean	16.1	31.3

Source: James (1996).

Table 4. Returns to investment in education (regional averages; per cent)

Region	Social			Private		
	Primary	Secondary	Tertiary	Primary	Secondary	Tertiary
Sub-Saharan Africa	24.3	18.2	11.2	41.3	26.6	27.8
Asia	19.9	13.3	11.7	39.0	18.9	19.9
Europe/Middle East/ North Africa	15.5	11.2	10.6	17.4	15.9	21.7
Latin America/ Caribbean	17.9	12.8	12.3	26.2	16.8	19.7

Source: Psacharapoulos, "Return to Investment in Education" World Bank, Washington, 1995.

Impact of public social spending. The Copenhagen Social Summit advocated restructuring public expenditures in favour of social expenditures and within social expenditures to those for basic social services such as basic education, basic health care, sanitation and nutrition. The examination of the relationship requires the determination of expenditure levels, the intrasectoral allocation and the specific sectoral indicators/outcomes. Methodological issues concern the definition of basic social services, the classification of public expenditures in accordance with basic social services and at different levels of government (Mehrotra, 1996).

Social expenditure levels in general and the intersectoral allocation to basic social services are clearly linked to key sectoral outcomes. Public expenditures on basic social services benefit especially the lower income groups due to their lack of income to purchase health and education services. Investments in

primary health care, public health, primary education and sanitation carry high positive externalities and justify government intervention to provide the services.

Table 5 relates public health expenditures to a health outcome, namely the Under-Five Mortality Rate (U5MR) and public education expenditures to female illiteracy rates. The analysis of the four low-achieving countries Tanzania, Guinea, the Philippines and Nepal, concerning the share of public expenditures on basic social services in total public expenditures shows relative low shares of 13.2 per cent, 14.1 per cent, 13.3 per cent and 8.5 per cent respectively. Contributing factors are the low level of aggregate public expenditures, the relative low share of social expenditures in total public expenditures, and the low share of expenditure on basic social services in total public social expenditures.

Table 5. Relationship between social spending and social outcomes

Low Achievers	Health Expenditure/ GDP ratio		U5MR 1992 (per 1000)	Education Expenditures/ GDP ratio		Female illiteracy 1990 (per cent)
	1975-85	1986-91		1975-85	1986-91	
Nepal	0.7	0.9	128	1.6	2.1	87
The Philippines	0.6	0.8	60	2.0	2.9	--
Tanzania	1.7	2.0	176	3.5	2.7	--
Guinea	--	0.6	230	--	1.8	--
High Achievers						
Malaysia	1.1	1.5	19	5.7	5.6	30
Sri Lanka	1.2	1.6	19	2.3	2.6	16
Mauritius	2.3	2.0	24	2.6	3.3	--
Botswana	1.6	1.8	58	6.0	6.3	35

Source: Gupta, et al (1998)

Figure 1

|

Relative high aggregate levels of public spending are thus no automatic guarantee for positive social sector outcomes. The intersectoral as well as the intrasectoral allocation and the efficient use of allocated expenditures also impact on specific social sector indicators. In the intersectoral allocation the level of foreign debt and of military expenditures are decisive factors (table 6).

Table 6. Sectoral public expenditure shares (1992, percentages)

	Health	Education Services	Military Security services	General public	Social	Housing	Economic
Nepal	4.0	13.8	5.7	----	----	----	49.0
The Philippines	5.9	21.5	16.9	13.9	3.8	2.4	38.3
Tanzania	9.3	12.6	10.2	27.0	----	----	35.8
Guinea	4.4	14.2	8.8	----	----	----	----

Source: Gupta, et al (1998).

The respective public health and education expenditure to GDP ratios as well as the public health and education expenditure to total government expenditure ratios slightly increased. The intrasectoral allocations,

especially the share of expenditures for basic public services, is relatively low. The trends are as follows (table 7).

Table 7. Trends in basic health and education expenditures

	Public Expenditure/ GDP ratio	Public Health Expenditure/ GDP ratio	Basic health expenditures/ total public health expenditure
The Philippines	low/increasing	low	low/increasing
Nepal	low/increasing	low	high/increasing
Tanzania	high/increasing	low	high
Guinea	low	low	high

	Public Expenditure/ GDP ratio	Education Expenditure/ GDP ratio	Basic educ.expenditures/ total public education expenditure ratio
The Philippines	low/increasing	low	high/increasing
Nepal	low/increasing	low	low/increasing
Tanzania	high/increasing	low	low/increasing
Guinea	low	low	low

Source: Gupta, et al. (1998).

The trends indicate imbalances in inter- and intrasectoral allocations. The allocations for basic social services are relatively low. This negatively affects social sector outcomes. The mobilizing of adequate resources requires appropriate taxation levels (to ensure adequate revenue levels) and restructuring of

inter- and intrasectoral allocations. These processes have to be guided by clearly-defined or envisaged social sector outcomes and have to be based on the indicated impact of intrasectoral allocations in favour of expenditures on basic social services.

Public social expenditure incidence

Conceptual and methodological issues

Several tax and transfer incidence studies have been undertaken. There are conceptual and methodological issues in this area. Public expenditure benefit incidence analysis is rather complicated. This relates to the measurement of the distribution of benefits to different socio-economic groups, households and individuals as well as the valuation of the benefits. There are rather sophisticated procedures to place individual valuations on public goods. The pricing of public goods, due to the absence of market mechanisms, is more difficult. The most common approach is to assume that incidence is proportional to income and that total benefits equal total costs. This proportionality assumption is in effect equivalent to treating benefit incidence as unmeasurable and to ignore the impact of public good distribution on income distribution. Recent studies (van de Walle, 1995) indicate the problems with the distributional outcomes of public spending, such as:

- Distributional outcomes which reveal levels of inequality and poverty unacceptable to prevailing social norms; and
- Lack of alternative policy instruments such as tax systems to be used for redistributive purposes. This increases the redistributive role of public spending.

The approach to measuring and designing the distribution of benefits related to public expenditures comprises the determination of the welfare objective and the measurement of the existing distribution of benefits.

Welfare objective. The welfare objective constitutes the yardstick for any measurement. Poverty reduction is often cited as a welfare objective. There is the need, in order to clarify the effects of public spending on poverty reduction, to determine the poverty measurement. Different concepts such as utility, income and capabilities are used. The utility-based approach to poverty measurement reflects individual preferences while the capabilities-related approach stresses the lack of certain basic capabilities such as health and education, as indicators of specific capabilities. Most often however, the policy objective formulated is the reduction of poverty.

Benefit incidence. The measurement and valuation of benefits arising from public expenditures and their

pricing pose formidable problems. Prices can not be determined by marginal valuation. Different individual/household characteristics and quantity restraints lead to different welfare gains. Methodologically, benefit incidence studies rank individuals or households by some welfare indicators such as per capita household income or expenditures. The cost of the provision of the public good are attributed based on information about its utilization. The "pre-intervention" position of individuals/households does not yet include the monetary value of benefits from public spending. The attribution of benefits is based on the costs which may not fully reflect the benefits received.

Behavioural approach. The impact evaluation of public spending requires comparing situations before and after the occurrence of specific spending policies. Public spending policies affect the economic behaviour of beneficiaries. Estimation-based techniques attempt to capture key behaviour responses. The evaluation is often based on the beneficiaries' own valuation of benefits, as one form of attributing benefits from public spending. Health and education outcomes are often set as objectives to guide public spending policies concerning the level, composition, distribution, pricing and utilization of such public spending. There are increasing efforts to incorporate behavioural approaches in benefit incidence evaluation, especially related to pre- and post intervention comparisons. This leads to better measures of the benefit distribution impact on welfare.

Results of benefit incidence evaluations

Some benefit incidence studies have examined total public spending on specific sectors such as education, health and transfers. Distinctions have to be made between the distribution of benefits in absolute terms (monetary amounts) and benefits expressed as a percentage of the welfare indicator such as per capita income or consumption.

Public health expenditures. Studies have usually relied on household budget surveys in order to identify access to different public services by households belonging to different income groups and to attribute benefits derived from public health spending (Jimenez, 1995).

Method. The question to be answered is who benefits from public spending? How does the receipt of benefits vary across groups with different levels of well-being? The steps are:

- ranking of households by income or

- consumption;
- estimation of the relative use of the public service by each income group;
- cost of the public service to be used as a proxy for the received benefits; and
- comparison of the level of well-being before and after the government intervention for different groups.

Jimenez indicates the following incidence of public health spending (table 8).

Public education expenditures. The methodology used in relevant studies is the same as the one described for public health expenditures. The allocation of benefits to lower-income groups depends on the relative costs of

different types of services, the distribution of benefits and the conditions for access (table 9, 10).

The majority of education and health services in developing countries are provided by central governments. These services are heavily subsidized, provided free or almost free. The differentiation of prices by type of services and by consumers are more efficient and equitable than low and uniform prices.

The implication is to increase prices for services such as higher education used by the higher income groups and publicly finance basic education services. Another essential feature is categorical targeting and means-testing.

**Table 8. Benefits of public health spending to income groups
(Percentage received by income groups)**

Country	Lower 40 per cent	Middle 40 per cent	Higher 20 per cent
Argentina	69	27	4
Chile	51	47	2
Colombia	42	40	18
Costa Rica	49	38	13
Dominican Republic	57	44	9
Uruguay	64	25	11
Indonesia	19	36	45
Iran	51	37	12
Malaysia	47	37	16
The Philippines	27	33	40
Sri Lanka	48	39	13

Source: Jimenez (1995).

Table 9. Benefit incidence of various public education expenditures (impact on equality)

	Argentina	Costa Rica	Chile	Uruguay
All education	+	+	+	+
Basic education	+	+	+	+
Secondary education	+	+	+	+
Higher education	-	-	-	-

+ = contributes to equality (lower gini-coefficient)

- = contributes to inequality

Source: Jimenez (1995).

Table 10. Benefit distribution to income groups of public education expenditures (Percentage)

<u>All education</u>	<u>Lower 40 per cent</u>	<u>Middle 40 per cent</u>	<u>Upper 20 per cent</u>
Argentina	48	35	17
Chile	48	34	18
Colombia	40	39	21
Costa Rica	42	38	20
Dominican Republic	34	43	33
Uruguay	52	34	14
Indonesia	46	25	31
Malaysia	41	41	18

<u>Higher education</u>	<u>Lower 40 per cent</u>	<u>Middle 40 per cent</u>	<u>Upper 20 per cent</u>
Argentina	17	45	38
Chile	12	34	54
Colombia	6	35	59
Costa Rica	17	41	42
Dominican Republic	2	22	76
Uruguay	14	52	34
Indonesia	7	10	83
Malaysia	10	38	52

Source: Jimenez (1995).

<u>Public social expenditure benefit incidence in Africa</u>	<u>clinics (primary level), district level hospitals (secondary level) and specialty hospitals (tertiary level).</u>
<p>A recent study examined the benefit incidence of social spending in Africa (Castro-Lead et al, 1999). The benefit incidence is based upon three steps.</p> <ul style="list-style-type: none"> • Estimation of the unit costs per person of a social service; • Allocation of unit costs to households/individuals; • Aggregation of households/individuals into sub-groups and comparison among different groups. <p><i>Public health expenditures.</i> In Africa, with the exception of South Africa, governments (public facilities) provide more than two-thirds of medical care. The patterns of response to illness exhibit the following features:</p> <ul style="list-style-type: none"> • Low-income groups are more inclined to self treat and are less likely to seek private modern care. • Higher income groups rely heavily on publicly provided services. <p>The public health systems are three-tiered with basic</p>	<p>Public health expenditures are generally concentrated at the tertiary level. Financing is based on general revenues, while cost recovery, in the form of fees represent a small part of the costs. The study combined units of health care delivery with data on the use of publicly-funded health facilities to estimate the benefit incidence of government spending on health (table 11).</p> <p>Public health spending is not well distributed to the low-income groups. Health spending is reasonably progressive. The cause of the unequitable distribution is the specific allocation to different levels of services and the relative use of these services.</p> <p><i>Public education spending.</i> Education attracts government expenditures in Africa mainly because of expected positive externalities and equity considerations. Investment in human capital is also being considered as an essential factor in stimulating growth and productivity. Formal education includes primary school, secondary school and university education. The government is the main provider of education in the included African countries. The size</p>

Table 11. Benefit incidence of public spending on health for the poorest and richest quintiles in selected African countries (per cent)

Country/year	Primary facilities		Hospital outpatient		All health		Total subsidy as share of household expenditures	
	Poorest	Richest	Poorest	Richest	Poorest	Richest	Poorest	Richest
Côte d'Ivoire, 1995	14	22	8	39	11	32	2.0	1.3
Ghana, 1992	10	31	13	35	12	33	3.5	2.3
Guinea, 1994	10	36	1	55	4	48	--	--
Kenya, 1992	22	14	13	26	14	24	6.0	1.1
Madagascar, 1993	10	29	14	30	12	30	4.5	0.5
South Africa, 1994	18	10	15	17	16	17	28.2	1.5
Tanzania, 1992/93	18	21	11	37	17	29	--	--

Source: Castro-Lead et al (1999).

of the private education sector varies. Public education is financed by both governments and households. The allocation of public funds to different levels of education varies also.

The unit costs for education are computed as net recurrent spending per student (total government recurrent spending less cost recovery). These costs are differentiated between different levels of education. The unit cost data are combined with information on the use of publicly subsidized education from household surveys to estimate the benefit incidence of government education spending (table 12).

Conclusion

Public education spending is generally progressive but poorly targeted. Public education spending is, however, more equally distributed than household income or expenditure. The unit costs differ substantially between levels of education.

Low-income groups gain more from public spending at the primary level, typically one-fifth, compared with one-tenth of the spending at the secondary level and almost nothing from spending at the tertiary level. Better targeted public spending on health and education has thus to be accompanied by better access to services by low-income groups. Fees should be applied to services where total demand for public and private services is price inelastic.

Targeting of public social expenditures

Benefit incidence studies provide information for restructuring public spending in order to improve the distribution of benefits. This requires identifying the envisaged benefit distribution related to specific target groups such as low-income groups. Improved targeting of public expenditure benefits also has to take into account the political economy considerations, such as interest group politics, and the administrative feasibility. Specific targeting can complement broad targeting and regulation of access to public services. Means testing can be used to identify the target groups. Universal provision and specific targeting options have to be assessed in order to determine the relative impact on benefit distribution. Participation in economic growth and access to basic social services can improve living standards for low-income groups. This can be supplemented by targeted public expenditures. Attempts to identify, for instance, the poor as a target group and to target benefits towards them can serve important redistributive and safety-net roles. The political value judgment that targeting should improve the benefit distribution of public spending in favour of low-income groups forms the basis upon which to consider the magnitude and form of targeting in different social sectors.

**Table 12. Benefit incidence of public spending on education in selected African countries
(per cent)**

Quintile shares of total spending

Country/year	Primary		Secondary		Tertiary		Total		Total subsidy as share of household expenditures	
	Poorest	Richest	Poorest	Richest	Poorest	Richest	Poorest	Richest	Poorest	Richest
Côte d'Ivoire, 1995	19	14	7	37	12	71	13	35	12.5	4.6
Ghana, 1992	22	14	15	19	6	45	16	21	13.4	3.1
Guinea, 1994	11	21	4	39	1	65	5	44	--	--
Kenya, 1992	22	15	7	30	2	44	17	21	27.8	1.9
Malawi, 1994	20	16	9	40	1	59	16	25	2.3	1.4
Madagascar, 1993	17	14	2	41	0	89	8	41	7.2	3.4
South Africa, 1994	19	28	11	39	6	47	14	35	42.1	5.1
Tanzania, 1993/94	20	19	8	34	0	100	14	37	--	--
Uganda, 1992	19	18	4	49	6	47	13	32	4.3	1.5

Source: Castro-Lead et al, (1999).

The objective of an improved benefit distribution has to be weighed against the associated costs for administering targeted programmes (Grosh, 1994). The costs of targeted schemes are usually higher than those of universal schemes, due to the costs of exclusion screening. Another factor to be considered in cases of targeted transfers is the behavioural response of the beneficiary. These behavioural responses affect actual outcomes. The impact assessment of targeted public social spending often requires the assessment of the counterfactual, a comparison of effects of a targeted scheme with alternative uses of the same resources.

Costs and benefits of targeted social expenditure programmes depend essentially upon the correct identification of the target group (poor, women, unemployed, etc.), the formulation of benefit distribution objectives, and the selection of the magnitude and form of targeting (design). In specific cases self-selection by the low-income groups has minimized costs and assured well-targeted benefit incidence.

The incidence studies¹ of the benefit distribution of public health and public education spending have indicated that allocations toward basic health care and primary education benefits low-income groups. Benefits per head account for a higher proportion of

their income or expenditures because of larger family size and the tendency of higher-income groups to use private health and education services. Another targeting effect results from intrasectoral allocations. A general increase of social sector expenditures can be combined with intrasectoral restructuring to improve benefit distribution. There are negative effects for the low-income groups which result from allocations to education and health care above primary levels. There are some successful examples of specific targeting programmes in the education and health sector. Such programmes are mostly focused on public employment schemes, cash transfers and family allowances. There is a need to examine specific targeting programmes in the health and education sector which go beyond the targeting of public expenditures toward different types of services in these sectors.

The impact assessment and the benefit incidence evaluation of public spending requires further refinement of the applied methodologies and the collection of adequate data. The relative scarcity of public funds necessitates such evaluations in order to achieve the maximum welfare effect with the given amount of public funds. The distributional impact of public spending needs careful analysis in order to improve public policies.

Endnote

¹ Specific targeted programmes, their costs and effects on specific target groups, in areas such as public education expenditures, public health expenditures, family allowances, food subsidies, public employment schemes are reviewed in: Van de Walle, Nead, 1995

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NEW METHODS OF PUBLIC EXPENDITURE CONTROLS

By Suresh Shende*

Introduction

There is a growing realization in the international community of the slow economic growth in most developing countries and countries in transition from centrally planned economy to a free-market economy (transitional economy countries) and of the related negative global implications. It is necessary that international organizations should promote and implement action-oriented responses aimed at enabling these countries to enhance financial resources mobilization capabilities and their efficient, effective and rational utilization to reduce inequalities in incomes and wealth as also achieve sustainable economic development with social justice.

Over a third of the population of developing countries, or about 1 billion people, is considered to be living below the "poverty line," according to the yardstick currently applied, namely, annual per capita consumption of less than US\$ 370. These are the "forgotten people" in the development process, having received little or practically no benefits from the economic growth over the past decades. The extremely difficult living conditions of the poor coupled with low life expectancies, malnutrition and high levels of illiteracy can be attributed, to a large extent, to gross public financial mismanagement and imperfect macroeconomic policies. The most effective means of reducing poverty and inequalities is the adoption of national development strategies which encourage sustainable economic development with social justice which increase income-earning opportunities with better access to the education, health and family planning services to the under-privileged sections of the population.

The utilization of public financial resources to improve education and health of the poor has proven to be an investment that benefits the economy as a whole, since a healthy and educated work-force means higher productivity and rapid economic growth. Generally, the market-oriented reforms and prudently implemented privatization programmes in the post cold war era were intended to yield increased foreign direct investment, streamlined public sectors and reduced inflation with a

•Enhanced resource mobilization:

view to bringing about a significant level of stability and economic prosperity. However, in many developing and transitional economy countries, reforms have been marred by "crony capitalism" and nepotism without a concomitant commitment to social justice, stability of national currency, competitive markets and establishment of democratic institutions and practices, resulting in unbridled mercantilism with vast sections of population being denied the opportunities and benefits of economic growth. In many cases, dishonestly implemented privatizations have resulted in public monopolies being replaced by private monopolies. The populist opposition has emerged in protest against the free market reforms which are perceived simply as a subterfuge for further enriching the "haves" at the cost of "have-nots." Improperly implemented free-market reforms have, at times, given rise to populist opposition to structural adjustment programmes backed by important international financial organizations, which, while often necessary, are looked upon with suspicion, as harmful and prejudicial to the interests of the poor.

In this context, it would be necessary for developing and transitional economy countries to grapple with the problems of mobilization of financial resources from both domestic and foreign sources, while at the same time, ensuring that those resources are utilized in the most efficient and productive way to benefit all classes of the population, especially the poor, and that the public financial operations are reliably and scrupulously accounted for to inspire the confidence of taxpayers, foreign donors and investors. To that end, the governments of developing and transitional economy countries, with the active assistance and participation of international financial organizations, should seek to strengthen their capacities in the following areas, namely:

□Enhanced mobilization of domestic financial

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- resources;
- Enhanced mobilization of government revenues;
- Enhanced mobilization of private (business and personal) savings;
- Enhanced mobilization of private foreign investment;
- Improved government financial management (public expenditure planning, budgeting, performance evaluation and accountability);
- Public enterprise reform and private sector development.

This paper will examine the various constituents of public financial management with an accent on public expenditure policies, implementation and controls, and the role and impact of Supreme Audit Institutions in this behalf.

Public financial management

Developing and transitional economy countries have a special responsibility to organize an effective financial management system for implementation of policies with a view to promoting national economic, social and developmental goals. Public financial management constitutes all or part of the processes and functions of planning and programming budgeting, budget execution and accounting, auditing and evaluation. All these activities are aimed at ensuring that, to the maximum practical extent, the government's financial resources are utilized efficiently, effectively and rationally to yield optimum results, in accordance with law, and with transparency and accountability to the legislature and the population at large.

The Group of Experts on the United Nations Programme on Public Administration and Finance in their Report on the Twelfth Meeting (A/50/525-E/1995/122, paras. 113-114) observed:

"In many countries, financial management capabilities have been eroded by the pursuit of financial populism, ineffective and distorted budgetary mechanisms and the breakdown of the existing financial management institutions....A central concern for all countries is how to harmonize methods of strategic management and control of aggregate financial variables with processes for changing expenditure priorities and enabling effective and innovative management of service delivery institutions."

Public financial management reform incorporates the following components:

- use of structured planning and programming as a means of evaluating and selecting ways of achieving desired objectives;
- determination of resource allocation within the framework of a unified budget;
- integration of budgeting and accounting;
- use of accounting principles which match service delivery with service costs;
- encouragement of financial accountability;
- measurement of outputs and inputs; and
- preparation of consolidated reports.

In most developing and transitional economy countries, there are serious constraints in the form of limited buoyancy of revenue mobilizations. As a result, the financial resources obtained through domestic or foreign sources, as loans or grants, need to be used rationally if development goals or planned fiscal adjustments are to be achieved. For effective mobilization of tax revenues, widening of the tax base ensures, to a large extent, realization of full tax revenue potential of the economy, through legislative and administrative means. The legislative steps include, exhaustive definition of income or basis of charge, plugging of loopholes to thwart attempts at tax avoidance and legislative amendments to overcome adverse judicial decisions to bring out clearly the legislative intent, sometimes even with retrospective effect for recoupment of lost revenue of preceding years. Administrative measures include reforming the institutional framework, ensuring efficient and effective tax administration, and strengthening the capacities of tax and customs administrators to combat tax evasion, achieve an optimum tax effort level and establish an appropriate tax structure.

In view of persistent budget deficits due to stagnant tax revenues, a number of developing and transitional economy countries are re-examining their expenditure priorities with the dual aim of curtailing and controlling their budget deficits and ensuring that the available financial resources are put to the most effective use. Reduction in the overall budget deficit is often achieved by expenditure containment measures rather than attempts to increase the revenue receipts. Since in the short-term, the possibility of substantial increases in revenue is limited, more emphasis needs to be placed on controlling expenditure growth since the expenditure base is ordinarily larger than the revenue base.

The basic problem faced by most developing and transitional economy countries is the need to provide the necessary social and economic infrastructure to meet the growing aspirations of the population, the expenditure for which is not commensurate with the almost stagnant nature of the revenue receipts due to a

variety of reasons, mainly, rampant and unchecked tax evasion in collusion with the corrupt elements of the revenue administration and absence of voluntary compliance thereby raising the cost of collection. In addition, the following adverse factors accentuate the position of budget deficits, namely:

- Most developing and transitional economy countries suffer from an excessive financial burden caused by a bloated bureaucracy with its demands for additional emoluments, facilities and privileges, and post-retirement benefits, which are further aggravated by inflationary pressures. Most public administrations in these countries are not models of probity or moral uprightness resulting in distortions in composition of public expenditure by inducing the corrupt officials to choose government expenditure less on the basis of public welfare than on the opportunity they provide for demanding bribes.
- Budget deficits are often being met by resorting to the public debt, thereby causing crowding out of private sector investment. In the absence of buoyancy of tax revenues, the growth of public debt results in an increasing interest burden which may, at times, absorb most of the tax revenues. This can lead to the alarming situation where normal current expenditure for running the basic governmental administrative apparatus may have to be met out of public debt, if not by printing additional currency, leading to inflation. Steuerle and Kawai (1996, ch. 5-7) have noted that in some countries, the interest on public debt and other hard-to-reduce spending, such as entitlements, accounted for three-fourths of total spending.
 - Most of these countries have legitimate apprehensions about armed external aggression and loss of their territorial integrity, leading to abnormal and uneconomic defense expenditure of large magnitude which may divert much-needed financial resources away from developmental objectives and priorities. It is not uncommon to see such defense expenditure financed by external or internal debt eroding scarce foreign exchange resources and increasing the interest burden.
 - Most of these countries have interest groups which demand special privileges or benefits, generally known as subsidies, which may take many

forms, such as, supply of electric power at free or concessional rates to the agricultural sector, irrespective of recipients' capacity to pay at least the marginal cost of power, or supply of fertilizers, pesticides and other agricultural inputs at free or concessional rates. There are indications that the size of government has a sizeable bearing on subsidies, with each percentage point increase in government spending to GDP ratio leading to about a 0.4% increase in the ratio of subsidies to GDP. The evidence also show that government subsidies are comparatively higher in countries with high ratios of government interest expenditure to GDP, large manufacturing sectors, large external current account deficits and a low degree of urbanization. Moreover, subsidies are generally predicted to increase with government expenditure (net of interest) and are affected by a host of other variable factors. To the extent the grant of subsidies to the under-privileged sections of the population is based on moral or equitable considerations, it is difficult to contest such claims but the economic cost of subsidies has to be reckoned when dealing with the question of budget deficits.

Role and size of government

In performing its economic role, the governments use many policy instruments, and thereby allocate resources, redistribute income and influence levels of economic activity. The normative role of government determines the guidelines, principles or norms for welfare-enhancing public sector intervention in the economy and may differ from its actual or positive role due to differences between the interests of the governed and those who govern, to mistakes and misconceptions on the part of policy-makers, to inadequate control of policy-makers over policy instruments and to the residual effects of past decisions. According to Tanzi (1997), apart from historical developments, the factors which determine the role of government are the following:

- Social attitudes, which may be determined by cultural heritage or religion;
- The level of economic development, which, depending upon the sophistication of the market and of private institutions, may call for more or less state intervention;
- The degree of openness of the economy;
- Technological developments, which may create or

destroy natural monopolies or may create or increase the need to regulate certain new activities, such as financial markets, communication, or transportation; and

- The quality of the public administration, which may impose limits on the scope of effective governmental intervention.

Unfortunately, the developing and transitional economy countries which seem to have the greatest need for an expanded public sector are often the least prepared. In these circumstances, when policy makers attempt to pursue an ambitious public sector role, as they often do, the results tend to be disappointing. While the evidence presently available points to a greater need for governmental action in developing countries as compared to industrialized countries, it is the latter which exhibit a much larger role for the government, when that role is measured by levels of taxation and public spending. On average, the level of taxation and of public spending, measured as a share of GDP, is at least twice as large in industrial countries as in countries, total public spending has exceeded 50% of GDP and for some even 60% of GDP. For the centrally planned states of Eastern Europe, this percentage was even higher.

The Secretary-General of the United Nations in his Report A/52/428 to the 52nd Session of the General Assembly stated the new catalytic role of the government as under:

“The government’s activities can be redefined and reduced in scope as it withdraws from the direct provision of services and manufacture. Experience has shown that governments can continue to play a vital role in creating an effective legal and regulatory framework in which the private sector is enabled to operate. As those in countries moving towards a market economy keep pointing out, the private sector cannot develop fully unless the government institutes a legal framework that guarantees and protects private property, governs business relationships and enforces the commitments involved in business contracts...”

A large share of production is carried out by state-

developing countries. This can be explained by the latter countries’ difficulties in raising tax revenue. According to Tanzi (1995), governments that cannot raise a desired level of tax revenue often do not scale down their role in the economy, but pursue that role through non-fiscal instruments, such as, quasi-fiscal activities and quasi-fiscal regulations. These activities are not connected with the budget but can have effects broadly similar to those of fiscal actions.

A quantitative impression of what a minimalist state might imply in terms of public spending is provided for the 1870 - 1913 period (table 1). Government expenditure, as a share of GDP, was much lower a century ago than in later years, in societies that were quite advanced and sophisticated. But the state did not extensively engage in activities such as higher education, health services, social security and public welfare. The level of expenditure needed for an extended role of the public sector among industrial countries today is considerably higher; for some

owned enterprises and traditionally, governments provide a large share of education, health services, road construction and maintenance as also run essentially commercial enterprises selling goods and services.

This type of non-financial government activity accounted for a weighted average of 4.9% of GDP in 8 industrial countries during 1978 - 1991 period while for 40 developing countries, the average was 10.7%. There was considerable variation even amongst industrialized countries with 18.2% for Portugal and 1.2% for the United States. Many government activities can, in principle, be carried out by the private sector, and in recent years there has been a strong movement towards privatizing government enterprises. In the United Kingdom, for instance, the share of government production fell from 6.6% in 1982 to 1.9% in 1991. Changes during the 1990s in Eastern Europe has strengthened the movement towards wholesale privatization. These trends reflect the view that privatization yields efficiency and welfare gains (Huizinga and Nielsen, 1997). Several studies have shown that state-owned enterprises perform substantially worse than similar private firms (Boardman and Vining, 1989).

Table 1. Government expenditures as share of GDP

	Late 19 th Century About 1870 <u>1/</u>	Pre World War I About 1913 <u>1/</u>	Post World War I About 1920 <u>1/</u>	Pre World War II About 1937 <u>1/</u>	Post World War II 1960	1980	1990
Austria	...	...	14.7	15.2	35.7	48.1	48.6
Belgium	...	...	...	21.8	30.3	58.6	55.5
Canada	...	...	13.3	18.6	28.6	38.8	45.8
France	12.6	17.0	27.6	29.0	34.6	46.1	49.8
Germany	10.0	14.8	25.0	42.2	32.4	47.9	45.7
Italy	11.9	11.1	22.5	24.5	30.1	41.9	53.2
Japan	8.8	8.3	14.8	25.4	17.5	32.0	31.7
The Netherlands	9.1	9.0	13.5	19.0	33.7	55.2	54.0
Norway	3.7	8.3	13.7	...	29.9	37.5	53.8
Spain	...	8.3	9.3	18.4	18.8	32.2	41.8
Sweden	5.7	6.3	8.1	10.4	31.0	60.1	59.1
Switzerland	...	2.7	4.6	6.1	17.2	32.8	30.7
United Kingdom	9.4	12.7	26.2	30.0	32.2	43.0	39.9
United States	3.9	1.8	7.0	8.6	27.0	31.8	33.3
Average	8.3	9.1	15.4	18.3 <u>2/</u>	28.5	43.3	45.9
Australia	...	...	...	...	21.2	31.6	34.5
Ireland	...	...	...	...	28.0	48.9	41.0
New Zealand <u>3/</u>	...	...	...	...	26.9	38.1	44.0
Average	8.3	9.1	15.4	20.7	27.9	42.6	44.8

Sources: European Commission, *Tables on General Government Data*, 1995; OECD Economic Outlook, 1994 and 1995; Vito Tanzi and Domenico Fanizza, "Fiscal Deficit and Public Debt in Industrial Countries, 1970-94," WP/95/49, May 1995; B.R. Mitchell, "International Historical Statistics," (various issues); Acha Hernandez, "Datos Basicos para la Historia de Financiera de Espana," 1976; Bureau of Census, "Historical Statistics of the U.S.A.," 1975; IMF, *Government Finance Statistics*; IMF, *World Economic Outlook*. Table reproduced from Vito Tanzi and Ludger Schuknecht, "The Growth of Government and the Reform of the State," (IMF Working Paper, forthcoming).

1/ Or nearest available year after 1870, before 1913, after 1920 and before 1937.

2/ Average computed without Germany, Japan, and Spain (all undergoing war or war preparations at this time).

3/ GFS data, data available for 1960 is 1970.

There are a range of productive activities which can be performed either by the government or the private sector. The activities differ in relative efficiency with which the government and the private sector can carry them out. Some activities tend to yield more output for given inputs when carried out by government, and vice versa. The comparative advantage the private sector has in carrying out certain activities depends, among other things, upon production externalities, if any, the public goods nature of the output, the feasibility of contracts in the private sector and the market structure that prevails in the private sector scenario¹. The

government can alter the range of its activities by privatizations or instead by take-overs. Private production also differs from public production in that it is subject to a distorting investment tax. Further, government has access to saving taxation and some taxation of private profits. In this background, the government jointly sets the range of state production activities, physical investment in these activities and tax policy. The optimal range of government activities is shown to depend upon the relative efficiency (or wastefulness) of government production as well as on the distortions created by the investment tax.

Presently, many economists and political scientists are redefining the role of the state in a world where technological advances have made major strides and countries' economies are getting closely integrated. In this new globalized world, the state will have to play a more significant and intelligent regulatory role; the private sector will have to carry a greater burden in areas that have traditionally been the responsibility of governments, such as the provision of infrastructure and of services provided by public utilities, and in areas such as pensions, education and health. According to Tanzi (1997), globalization and tax competition are likely to reduce the scope for redistributive policies by reducing the resources available to national governments. At the same time, the role of national government in regulating activities will increase, involving a major change in government's role. However, the governments cannot abdicate the role of distribution of income which will become more difficult due to globalization and tax competition.

Budgetary reforms

Budgeting ideally involves:

- The appraisal of governmental activities in terms of their contribution to national objectives;
- The projection of governmental activities over an adequate time period;
- The determination of how these objectives can be attained with minimum resources;
- The revision of the budget, in the light of changing circumstances.

The scope of a government budget should not be limited to a statement of all receipts and expenditures of government but should reflect the overall concerns of development. In order to give a comprehensive picture of government strategy, a central government should cover consolidated transactions of all the levels of government and of government entities. Also, to ensure consistency and balance in the mobilization and use of real resources, the main budget should be accompanied by budgets for foreign exchange, credit, manpower and other real and material resources. Multi-year budgeting stimulates the formulation and pursuance of long-term and consistent policies for the mobilization of resources. It brings into focus issues of demand management and real resource balance and enables coordinated and uninterrupted implementation of long-term projects.

Numerous countries have adopted the planning-programming-budgeting system, which specifies

programme objectives in quantitative terms, measures benefits and evaluates the cost of each programme in the light of expected results and the results actually achieved. Programme budgeting is an effective management tool in developing and transitional economy countries which must take into account uncertainties of both external and internal origins. To avoid major economic collapses and setbacks, such countries may have to establish reserves of foreign exchange and other material resources; they may have to exert substantially greater control over income distributions and national flow of funds. Increasing external vulnerability exerts a strong influence on budgeting. Dealing with uncertainties calls for considerable innovation and flexibility in budget policies and techniques. Success in the preparation of comprehensive budgets in the formulation of sound budget policies and in the monitoring of budget implementation depends upon the availability of required data and information. Measures must be implemented for improving the collection and compilation of needed data.

In the monitoring of the development process, agencies and officials responsible for budgets and programmes need continuous information on the structure of the economy, the mobilization and use of resources and their costs, the outputs generated and the contribution of outputs to national objectives and goals. Moreover, the data is required on the financial aspects of transactions as also on their economic and physical aspects and performance. In order to achieve consistency and allocative efficiency in the management of programmes and projects, such data is needed at the national, sectoral, programme and project levels. Many developing and transitional economy countries may find it difficult to generate such information because of weakness in their accounting systems. The reforms needed in these systems should include the reconciliation of budget and accounting structures, training of accountants, decentralization of accounting responsibilities, proper record-keeping and production of timely and accurate data.

The scope of public accounting systems may need to be extended to define and introduce new accounting concepts and to establish multiple accounting structures to generate the various kinds of data required to manage public affairs and measure the cost, performance and productivity of government programmes and projects. The strengthening of accounting can improve project management and throw considerable light on the efficient use of resources and on optimal resource mixes. In most countries, there is an absence of liaison among the planning, budgeting, accounting and audit agencies. If accounting is to serve the overall needs of

financial management, coordination among these agencies must be ensured.

The number of different institutions involved in financial management makes cooperation a necessity. Often, however, there are serious deficiencies in many areas, and organizations attempt to go their own way. Inability to carry out economic analysis or forecasting results in an inability to anticipate shocks and deviations. External borrowing may be subject to little control. Budget coverage is often restricted, as earmarked or special funds evade budgetary discipline. Deteriorating accounting and financial information systems prevent adequate knowledge of the financial situation. Faced with resource constraints and intermittent uncertainties, the Ministry of Finance may be unable to rely on information, projections or basic institutional controls and may resort to short-term expenditure controls and repetitive budgeting to cope with recurrent crises to maintain financial viability. Cycles of boom or bust budgeting reflect an inability to maintain policies in good times and cope with periodic and severe downturns. The concentration of reform efforts at the centre ignores the need to improve capacity in the system as a whole, and throughout the institutions managing public finances, particularly the programme units.

This situation may not be prevalent in all countries and several have improved and maintained their standards through such reforms as public investment planning, project data banks, integrated financial management systems and programme budgeting. In many countries the problems persist and have been resistant to change. Is it possible for these countries to strengthen financial management capacity so that the governments may use their institutions and processes to establish and pursue national objectives, to promote favorable economic conditions, to manage its diverse activities, to respond to the demands of citizens and groups, to assess past performance, and to plan for the future?

Public expenditure management and controls

The Report of the Secretary-General to the Commission on Sustainable Development (E/CN.17/1997/2/Add.23 dated 22 January 1997) observed as that:

“43. With respect to domestic resource mobilization for sustainable development, it may be necessary to consider a wider range of instruments and mechanisms, and *to discuss*

reforms in such areas as public expenditures (subsidies, military spending, and unproductive public expenditures). Furthermore, policy guidance is needed on how to redirect financial resources through macro-economic and structural reforms. In addition, it will become increasingly important to discuss how greater private-sector participation in the financing of sustainable development can be achieved.” (Emphasis supplied)

Annual budget deficits and cumulated government debt have grown substantially in many developed countries over the last 20 years and most of them have adopted policies to regain budget balance. The present problem of budget deficits and public debt has arisen because the growth in government spending has exceeded the growth in revenues. Although the average ratio of tax revenues to GDP in industrialized countries increased from 28% in 1960 to 44% in 1994, the corresponding ratio for government expenditure to GDP rose from 28% to 50%. Given the high levels to which taxes have risen and the danger of stifling growth by raising taxes further, apart from adverse political fallout therefrom, it is reasonable to suppose that reducing government spending offers the best means, if not the only means, of eliminating the fiscal imbalances (McDermott and Westcott, 1997).

In order to establish the relationship and dynamics between deficit reduction and economic growth, a study was carried out regarding determined action to reduce the budget deficit or, in economic terms “fiscal consolidation” which is defined as one that meets two criteria, namely:

- the ratio of the “structural primary balance” to potential GDP at full employment (called “fiscal impulse”) improved or, the deficit fell by 1.5% points over a two-year period. The structural primary balance means fiscal balance (fiscal deficit/surplus) less interest payments and the part of the recorded balance resulting from the phase of business cycle; and.
- the ratio did not deteriorate in either of two years.

(This technical definition only means that over the two-year period, after accounting for interest payments and the effects of business cycle, the deficit fell because government spent less or taxed more). No fewer than 74 episodes were found to meet this two-year criterion for fiscal consolidation in the 20 countries during 1970 - 1995.

The composition of fiscal consolidation is also important. The episodes of fiscal consolidation for which sufficient data exist were divided into two categories: those in which the deficit was cut mainly (at least 60%) through revenue increases, and those in which it was reduced mainly (at least 60%) through expenditure cuts. Of the 17 cases in which most of the adjustment took the form of expenditure reductions, just under half were successful, while among the 37 cases where the consolidation was achieved mainly by raising taxes, less than one out of six had successful outcomes. The message is reinforced by the fact that the average structurally adjusted expenditure cut in the successful episode was 3.7% of GDP, while in the unsuccessful cases it was only 2.1%. Government employment, the government wage bill, and government consumption were cut in the successful cases, but remained constant or increased in the unsuccessful ones. Social security payments and transfers were kept in check in the successful episodes, but expanded as a share of GDP in the unsuccessful cases. Fiscal consolidations that concentrate on the expenditure side, and especially on reducing transfers and government wages, is more likely than tax increases to succeed in lowering the public debt ratio. However, it has to be noted that fiscal consolidation undertaken in an environment of disappointing economic growth and high interest such as in the 1980-82 global recession, will probably fail (McDermott and Westcott, 1997).

Since 1986, the International Monetary Fund has supported the adjustment programmes of low-income member countries with loans on highly concessional terms through its Structural Adjustment Facility (SAF) and Enhanced Structural Adjustment Facility (ESAF). These facilities are based on two premises, firstly, that macro-economic stabilization and structural reform of economic systems and institutions complement each other and secondly, that both are needed for economic growth with external viability. These programmes envisaged relatively modest adjustments in the overall fiscal balance as the fiscal deficit was slated to decrease about 1% of GDP from the pre-programme year. During the programme period, significant progress was achieved with fiscal consolidation, with fiscal deficits falling significantly in countries where, on average, the initial deficits were highest (i.e. countries with deficits greater than 10% of GDP). In these countries, the average overall fiscal deficit shrank from 13.8% of GDP in the pre-programme year to 9.5% of GDP in the most recent year. The results of the adjustment programmes varied considerably by region: transitional economy countries outperformed expectations although from excessively high initial deficits, economic performance in Asian and African countries fell slightly

short of expectations and performance in Western Hemisphere countries fell significantly short of targets. The annual targets in SAF/ESAF programmes have aimed, on average, to maintain total expenditure as a share of GDP while shifting the composition from current to capital expenditure. Relative to average spending in three years prior to the programme, these adjustment programmes envisaged that capital expenditure should rise by an average 1.4% of GDP and that current expenditure would fall by an average 2.2% of GDP. According to initial three-year-ahead targets, SAF/ESAF countries sought to reduce non-interest public expenditure by 1.9% of GDP (Abel et al, 1988).

During the typical adjustment programme period, SAF/ESAF countries succeeded in changing the composition of expenditure in the desired direction. The share of capital expenditure in the total increased and that of current expenditure decreased, although the changes often fell short of the extent envisaged. Within current expenditure, the share of wages and salaries in GDP was, on average, slightly higher than envisaged but substantially lower than in the pre-programme period. The overall decline in wages and salaries as a share of GDP was due more to real wage shrinkage than to employment curbs in civil service reforms. The allocation of outlays by function changed significantly, with less expenditure on military, general public, and economic services (essentially subsidies and transfers) and more outlays on education and health. One benefit of the adjustment programme was that expenditure management improved in a number of SAF/ESAF countries, aided by extensive technical assistance from the IMF. However, shortcomings in expenditure management have persisted in many countries, which have impeded fiscal adjustment and structural reforms. Those countries with no programme interruptions generally had lower expenditure-to-GDP ratios than programmed. Education and health expenditure rose in real terms and in relation to GDP after the initiation of the first programme in SAF/ESAF countries. Real annual expenditure per capita on education and health rose by 3.8% and 4.8%, respectively. However, in both cases, the results varied considerably among countries.

General lessons of expenditure reforms under SAF/ESAF

The actual experience of carrying out SAF/ESAF programmes since the last decade has led to the following specific recommendations concerning public expenditure reforms:

- As regards public employment, programmes should lay down explicit monitorable quantitative targets based on actual numbers of workers rather than positions. Moreover, the

programmes should focus on medium-term plans, instead of one-shot reductions, and on strengthening or creating institutions that ensure control over recruitment and the civil service payroll.

- Considerable scope exists for improving the level, efficiency and benefit incidence of social expenditure. Progress in this area is presently constrained due to limited data on functional categories of social expenditure. It would be desirable to prepare and make available comprehensive and timely data on expenditures by function so that adjustment programmes can incorporate targets which are realistic, easy to monitor and supported by underlying analysis.
- The reform of budgeting and expenditure control systems should place greater emphasis on improving the quality of human capital, providing the appropriate incentives for officials charged with carrying out reforms and ensuring transparency and accountability.
- Since revenue shortfalls often adversely affect expenditure composition and the accumulation of arrears, contingency measures on the expenditure side need to be considered systematically and specify a core-budget of high priority allocations which would be protected from *ad hoc* cuts.
- Capital expenditure targets should be based on realistic expectations of the capacity for project implementation, and care should be taken to protect essential public investment from budget cuts.
- Social safety net measures are highlighted in programmes, but information concerning their impact on the target population groups is scarce. Greater effort should be made to follow up on these measures, particularly to ascertain whether programmes are reaching their intended beneficiaries.

The basic objective of public expenditure management is effective utilization of public financial resources to enhance the socio-economic welfare of the population by making rational and intelligent choices of competing objectives to yield optimum results. Although the capacity to incur expenditure is constrained by the availability of revenue receipts, it would be prudent to maintain the level of expenditure as a share of GDP, while shifting expenditures from current to capital items. The usual form of ensuring harmonious public

expenditure management is to ensure budgetary savings in annual targets through cuts in public sector employment and inefficient subsidies and transfers and to utilize these savings to increase capital expenditure on basic infrastructure and social sectors. It is possible to achieve gains in expenditure productivity through the reallocation of resources to basic health care and primary education, improvements in the targeting of basic services to the under-privileged sections of the population, and a reduction in excessive military expenditure. Capital expenditure is generally perceived as potentially more efficient at the margin than current expenditure but this conclusion would be incorrect if the investment turns out to be relatively unproductive. In short, public expenditure should be made more efficient and productive through improvements in budgeting and expenditure management.

Civil service reforms

As shown by the experience from SAF/ESAF adjustment programmes, civil service reforms constitute an important element of programme design, with the World Bank mostly taking the lead. In most programmes, nearly half of the savings in current expenditure was expected from wages and salaries which were targeted to fall by an average of 1% of GDP. In general, the reforms typically involve some combination of reducing the excessive numbers of public sector employees, eliminating "ghost" workers, maintaining competitive wages (in particular, for high-skilled employees), eliminating distortions in the wage structure by increasing the differentials and reducing non-wage benefits, restructuring ministries and rationalizing their functions. These reforms would often be accompanied by civil service surveys or efforts to otherwise improve the personnel database and personnel management systems. There should be clear and unambiguous enumeration of functions for each employee and effective performance appraisal at the end of each year to determine their suitability to function in the organization. Many of the ESAF countries trimmed public sector employment through different means, including limits on recruitment, early retirement or more strictly enforced retirement rules, voluntary departure programmes, and retrenchment resulting in substantial employment reductions. Care has to be taken to ensure that the retrenchment programmes are not more costly than envisaged. In some cases, the compensation packages tended to be unduly generous and poorly designed with severance payments often increasing too rapidly with years of employment, which encourages the most senior or skilled civil servants to leave the public sector,

increasing the fiscal cost of the reform. In some cases, efforts to generate financial savings through retrenchment are negated by hiring at the highest end of the wage scale while reducing lower level positions. As indicated in the SAF/ESAF programmes, there should be a clear target laid down for reduction in the wage bill over a period of years.

Subsidies and transfers represent an important constituent of public expenditure in most developing and transitional economy countries. They are generally intended to benefit identified specific sections of the population who deserve special treatment. Although laudable as an effective measure for ameliorating the living conditions of the targeted population, subsidies and transfers at times fail to achieve their objective due to administrative failure, inefficiency and corrupt practices as well as difficulties in reaching the targeted beneficiaries. Another problem associated with subsidies and transfers is the failure to ascertain the exact cost to the Exchequer; in other words, very often governments provide the goods or services to the targeted population either free or at a concessional rate which results in a subsidy. It is essential for the government to ascertain the actual cost of the goods or services so provided and then to decide whether the economic cost of the subsidy is worthwhile. In a majority of cases, it may be desirable for governments to charge the beneficiaries at least the marginal cost of the goods or services so as to remove the subsidy element altogether. There should be a programme to reduce subsidies and transfers by a specified percentage of GDP over a period of years, reflecting in part a lower transfer to public enterprises and a better targeting of consumer subsidies. In transitional economy countries, the reduction of subsidies and transfer payments should be given high priority because such spending played an especially large role in the pre-transition period. Generalized consumer subsidies are considered an inefficient means of increasing the consumption of the poor and budgetary transfers to enterprises often sustain inefficient state-owned firms.

Military expenditure as a percentage of GDP was reduced in SAF/ESAF countries from 2.9% to 2.5% and declining for three-fourths of the countries represented a world-wide trend towards lower military spending arising in some cases, by improvements in the regional security, or internal security and a demobilization of soldiers that freed resources for high-priority social spending (table 2). Some countries also manipulated reduced recorded total spending below programmed levels by modifying some other aspects of fiscal behaviour, for example, by pushing some spending off-budget, increased implicit subsidies or quasi-fiscal operations of public financial institutions to offset declines in subsidies and transfers, or increased arrears or contingent liabilities through the provisions of government guarantees. Certain mid-term corrective actions were taken, when the revenue shortfalls were met by cutting expenditure across the board to meet the fiscal targets, which led to an accumulation of expenditure arrears of as much as 5% of GDP. This engendered inefficiencies in expenditure allocations by continuing to support low-priority programmes while depriving high priority ones, such as, for operations and maintenance of budgetary allocations. Secondly, several countries responded by offsetting expenditure overruns in one area with cutbacks in others. This action was most unscientific and involved irrational transfer of resources leading to failure of programmes.

Most developing and transitional economy countries face problems of poor budgeting, lax expenditure control and evaluation, inadequate institutions, lack of adequately trained manpower, and weak political commitment leading to failure to implement structural reforms in the areas of civil service and public investment programmes. These problems have contributed to difficulties in meeting expenditure targets, either in terms of levels or composition of expenditure. The prevalence of extra-budgetary funds at the separation between capital and current budgets

Table 2. Summary of expenditure by function
(Averages of SAF/ESAF country samples)

	Average of Three Years Prior to Programme	Pre-programme Year	Latest Year (1994 or 1995)	Latest Year Minus Three-Year Pre-programme Average ^{1/}	Latest Year Minus Pre-programme Year ^{1/}	Number of Countries ^{2/}
In percent of GDP ^{3/}						
Total expenditure and net lending	29.0	27.6	26.1	-2.6	-1.6	36
General public services	3.5	3.5	3.2	-0.4	-0.3	19
Military spending	2.9	2.9	2.5	-0.4	-0.4	26

Education	3.6	3.6	4.2	0.3	0.5	23
Health	1.6	1.6	2.0	0.3	0.4	23
Social security and welfare	1.9	1.9	1.8	--	0.3	17
Housing	0.8	0.5	0.6	-0.2	0.1	11
Economic services	5.0	5.1	4.9	-0.2	0.3	19
Transportation and communication	1.5	1.2	1.3	-0.1	0.2	13
In percent of total Expenditure and net lending						
Total expenditure and net lending						
General public services	14.9	14.7	13.9	-2.6	-2.4	19
Military spending	13.0	12.0	11.3	-1.7	-1.4	26
Education	13.8	14.3	16.0	1.5	1.8	23
Health	5.8	6.1	7.4	1.1	1.3	23
Social security and welfare	6.4	6.7	6.1	--	0.8	17
Housing	3.0	2.1	2.5	-0.3	0.4	11
Economic services	19.6	19.8	18.7	-1.2	0.2	19
Transportation and communication	6.2	4.6	5.5	-0.2	1.2	13

Sources: IMF, *Government Finance Statistics Yearbook* (1995) and staff estimates; country authorities.

- 1/ Figures may not equal the difference between the latest year and the preprogramme values because they represent an average of deviation of outcomes from preprogramme values for each sample country.
- 2/ Number of countries for which data are available for a given expenditure. If the sample size varies for different columns, the maximum figure is given.
- 3/ The sum of expenditure components may differ from totals because of differences in sample size and the fact that net lending and other items may be excluded from the functional categories.

have also led to time and cost overruns and inefficiencies. The lack of budget monitoring and evaluation has limited governments' ability to improve expenditure productivity, resulting in spending overruns and the build-up of arrears in the capital budget. In most cases, weak or non-existent expenditure control mechanisms, including at the sub-national level, and parliamentary approval of unbudgeted expenditures have caused fiscal targets to be missed or large expenditure arrears to accumulate. Several improvements to strengthen expenditure management can be effected to remedy such situations, namely, establishment of a treasury to enhance the overall control of expenditure and cash management, periodic budget reviews of spending agencies, comprehensive coverage of government finance including budgetary and extra-budgetary activities, adoption of approved public investment programmes, budget-integration with the fiscal programme, strengthening institutional framework and upgrading the technical skills of personnel, etc.

Accounting and auditing

The scope of public accounting systems may need to be extended to define and introduce new accounting concepts and to establish multiple accounting structures to generate the various kinds of data required for managing public affairs and measuring the cost, performance and productivity of government programmes and projects. The strengthening of accounting at the project level can improve management of the project and also throw light on the efficient use of resources and on optimal resources mix. The UN Manual on Government Accounting specifies three types of accountability objectives:

- Fiscal accountability, which via the accounting system ensures that applicable laws and regulations are followed, that financial records and reports are accurate and represent a fair result of government operations, that the accounts and reports are issued in time, and that expenditure is within legislative appropriations;
- Managerial accountability which stresses the need to provide essential information for the use of managers ensuring efficiency and economy of operations and avoidance of waste;
- Programme results accountability which demands the evaluation of programmes in terms of effectiveness, to find out whether a programme or activity is achieving its intended goals.

Sound financial reporting is significant for both those within and outside a government who are concerned with its financial affairs. Within a government, the effective management of financial affairs calls for well-founded strategic, managerial and operational decisions in order to avoid any waste and mismanagement of financial resources. In order to make such decisions, policy-makers and managers require relevant and reliable information, appropriately reported to enable them to meet their responsibilities for strategy, management and operations. The significance of sound financial reporting is therefore to enable well-judged decisions to be made and thereby to facilitate the effective management of its financial affairs and the efficient use of its financial resources.

Government accounts of developing countries have frequently been characterized as inadequate. Government accounting, according to Peter Dean may be defined as: "the process of recording, analysing, classifying, summarizing, communicating and interpreting financial information about government...reflecting all transactions involving the receipt, transfer and disposition of government funds and property" (Dean, 1996).

Accounting systems should provide information to a variety of users. Accounting should be "accurate and reliable, responsive and timely, verifiable...and relevant to the needs of those who use it" (Dean, 1996). Dean (1996) found a wide variation in the quality of accounting practices among different countries, and a clear correlation between better accounting and per capita income and higher education. Clearly, if government capacity is to improve, good accounting is a basic pre-requisite.

Transparency in government operations

The recording basis of government transactions, namely, cash and accrual, has important implications for the transparency of fiscal performance. Reliance solely on the cash-based approach, although helpful for assessing the impact of government borrowing on inflation and the external balance, can result in a misstatement of the magnitude and timing of fiscal operations. By comparison, the accrual based approach is indispensable for gauging the macro-economic repercussions of fiscal policy, especially over the medium to long-term (Kopits and Craig, 1998). There has been a growing recognition of the serious shortcomings of pure cash-based measures for both fiscal and financial reporting. Expenditure arrears, transactions-in-kind, contingent liabilities and other non-cash operations have an economic impact before they are reported in cash or modified cash-basis

reporting systems. These effects are recognized in accrual basis systems and also need to be taken into account in macro-economic policy-making. It is proposed that the Government Financial Statistics (GFS) prepared by the IMF be changed from its present cash basis to an accrual basis of fiscal reporting. For those countries that also adopt accrual basis accounts, financial reports and fiscal reports will converge in some respects. Accrual basis accounts, though introducing additional demands in terms of recognition of transfer of ownership, will also help governments assess their effectiveness and efficiency in utilizing the resources at their disposal. Cash measures have serious limitations from this perspective, including the inability to capture the effects of non-cash items.

Several governments have moved to, or are investigating, a shift to accrual measures. IFAC has noted that the accrual accounting system is used by governments in the United Kingdom, Australia and New Zealand, by central government agencies in Sweden, and by local governments in many countries, including Malaysia, Switzerland and Italy. Canada uses the modified accrual and is moving towards a full accrual system. Countries as diverse as France, Mongolia and Chile are seriously investigating a shift to a modified accrual or full accrual system. It does not, however, mean that the accrual system is feasible for many countries in the near future. Accounting system design should be particularly conscious of both financial and fiscal objectives, whatever basis of accounts recording and reporting is used.

Many governments have embarked on the ambitious project of improving accounting and financial reporting standards. The work of IFAC and the proposed revision of IMF's GSF Manual together with the Code for Fiscal Transparency are further steps towards development of standards which will help improve international comparison of data and contribute to improved fiscal transparency. It is important to distinguish the different objectives of these initiatives and coordinate work in all these areas. The Public Sector Committee (PSC) of IFAC has released a draft "Guidelines for Government Financial Reporting" aimed at primarily helping national governments prepare financial statements. The Guidelines will not be an accounting standard but a statement of principles which will be a basis for international public sector accounting standards developed by the PSC. The Guidelines have defined the bases of accounting used by government in terms of four spectrum: cash, modified cash, modified accrual and accrual. Although most governments operate cash or modified cash basis accounting systems, at least

certain aspects of accrual standards could be applicable to financial reporting even though their underlying system may remain predominantly cash-based.

IMF is proposing to change the GSF from its present cash basis to an accrual system of reporting. This change recognizes the growing importance of accrual concepts for government accounting and aims at harmonizing GSF with other international financial statistics systems, namely SNA that use the accrual concept. The proposed revision will not require that countries adopt an accrual accounting system: a staged transition is envisaged, and countries could adjust data from their cash accounts or, in many cases, use cash data where differences between cash and accrual are not substantial. IMF's Code for Fiscal Transparency aims to support the application of GFS and international accounting standards emphasizing that, firstly, all countries report on financial assets and liabilities, introducing some elements of a modified accrual standard; secondly, all countries aim to have an accounting system that can produce reliable reports on arrears. Such reports could be produced at a memorandum level by a cash system. The need to extend this system to a modified accruals system where accounts payable are automatically recorded as expenditure should be determined by each country on a cost-benefit basis. These changes will also facilitate the development of more reliable fiscal reports for macro-economic analysis (IMF, 1988).

It would be instructive to note the specific recommendations of the Code for Fiscal Transparency on government accounting matters:

- The annual budget and final accounts should include a statement of the accounting basis (i.e. cash or accrual) and standards used in the preparation and presentation of budget data;
- Procedures for the execution and monitoring of approved expenditures should be clearly specified; and
- A comprehensive, integrated accounting system should be established. It should provide a reliable basis for assessing payments arrears.

An effective accounting system is the basis for timely and reliable information on government activities. Accounting systems should be based on well-established internal control systems, allow for the capture and recording of information at the commitment phase and thereby generate reports on arrears, cover all

externally financed transactions in a timely way, maintain records on aid-in-kind, and encompass balance sheet transactions, such as debt issued in connection with bank recapitalization.

Internal control systems

As observed in the IMF's *Manual of Fiscal Transparency*, sound control systems can make an important contribution to the reliability of fiscal and financial data, and are the starting point for ensuring the integrity of the recording and reporting process. While government systems vary widely, standards for internal control vary less. Broadly defined, internal control is the management tool used to provide assurance that management's objectives are being achieved. Under this broad definition, internal control also covers administrative controls (procedures governing decision-making processes) and accounting controls (procedures governing the reliability of financial records). Responsibility for internal control, therefore, rests with the head of each individual government agency. However, a central government agency might be assigned responsibility for developing a government wide standard approach to internal control.

As defined by the International Organization of Supreme Audit Institutions (INTOSAI), the objectives of internal control systems are to promote orderly, economical, efficient, and effective operations; to safeguard resources against loss due to waste, abuse mismanagement, errors and fraud; to adhere to laws, regulations, and management directives, to develop and maintain reliable financial and management data; and to disclose these data in timely reports. To be effective, internal controls must be appropriate, function consistently as planned throughout the period, and be cost-effective. The set of guidelines for internal control standards issued by INTOSAI are summarized below:

INTOSAI has issued a set of general and detailed standards defining a minimum level of acceptability for a system of internal control:

General standards

- Specific control objectives are to be set for each activity of the organization, and are to be appropriate, comprehensive, reasonable and integrated into the organization's overall objectives;
- Managers and employees are to maintain a supportive attitude to the standards at all times, and are to have integrity, and sufficient competence to meet the standards;
- The system is to provide reasonable assurance that the objectives for an internal control system will be met;
- Managers are continually to monitor their operations and take prompt remedial action whenever necessary.

Detailed standards

- Full documentation of all transactions and the control system itself to be provided.
- Transactions and events should be promptly and properly to be recorded.
- Execution of transactions and events should be properly authorized.
- Key responsibilities at different stages of a transaction should be separated among individuals.
- Competent supervision is to be provided to ensure control objectives are being achieved.
- Access to resources and records is to be limited to authorized individuals who are accountable for their custody or use.

An innovative example of government wide approach to internal control is that adopted in France and in Francophone countries based on the French administrative system, where there is a clear distinction imposed by law between the public agency requesting the payment, a special unit of the Ministry of Finance that approves all expenses, and the accounting department of the Ministry of Finance that makes all payments. Other systems also separate the power to authorize commitments from that of making payments, but are more decentralized and emphasize the responsibility of management of each individual government agency for setting a sound control environment.

Procurement and tendering

The *Manual of Fiscal Transparency* has laid down that procedures for procurement and employment should be standardized and accessible to all interested parties (3.3.2). Contracting for goods and services, particularly where large contracts are involved, must be open and transparent to provide assurance that opportunities for corruption are minimized and that public funds are being properly used. Similar considerations should apply to contracting out government services or management processes, and to privatization. It is necessary that appropriate tendering mechanisms are set up for contracts above a threshold size, and procurement regulations should give independent authority to a tender committee or board and require that its decisions be open to audit. Where services formerly provided within government are contracted out to the private sector, these procedures should be subject to the same or similar procurement regulations. In this area, the OECD and the World Bank helped many countries to establish modern procurement systems, and good progress has been made in the transitional economy countries towards establishing sound and transparent procurement systems.

Transparency in government operations is regarded as an important pre-condition for macro-economic fiscal sustainability, good governance and overall fiscal rectitude. In this context, fiscal transparency is considered as openness towards the public at large, about government structure and functions, fiscal policy intentions, public sector accounts, and projections. It involves ready access to reliable, comprehensive, timely, accurate, understandable, and internationally comparable financial information on government activities - whether undertaken inside or outside the government sector - so that the electorate and financial markets can accurately assess the government's financial position and the true costs and benefits of government activities, including the present and future economic and social implications. Transparency in government operations consists of several dimensions, firstly, the provision of reliable information on government's fiscal policy intentions and forecasts; secondly, detailed information on government operations, including publication of comprehensive budget documents containing properly classified accounts for the general government and estimates of quasi-fiscal activities conducted outside the government; and thirdly, behavioral aspects, including clearly defined conflict-of-interest rules for elected and appointed officials, freedom of information requirements, a transparent regulatory framework, open

public procurement and employment practices, a code of conduct for tax officials and published performance audits. These aspects of fiscal transparency are closely associated with the successful implementation of good governance.

Auditing

The *Manual of Fiscal Transparency* has observed that budget execution should be internally audited and audit procedures should be open to review (3.3.3). Effective internal audit by government agencies is one of the first lines of defense against misuse and/or mismanagement of public funds. Internal audit is defined as internal to the executive branch of government while external audit is external to the executive. Internal audit therefore covers both an audit of an agency by the staff of the agency itself (ideally reporting directly to the senior management) and an audit of an agency by another agency (e.g., by an audit body under the control of the Ministry of Finance or the Prime Minister). It should be based on a sound internal control environment and not seen as a substitute for one. Examination by internal auditors also provides valuable material for review of financial compliance by external audit agencies. The existence and effectiveness of internal audit should be assured by requiring that internal audit procedures be clearly described in a way that is accessible to the public, and that the effectiveness of these procedures should be open to review by the external auditors.

At times, the function of traditional audit, which is to verify the legality and financial accuracy of transactions, is not effectively performed owing to weaknesses in the accounting systems that provide the basis for audit, the lack of trained personnel, the insufficiency of financial resources allocated to audit, the absence of clearly defined audit standards and, in some cases, the less than adequate independence enjoyed by audit authorities. Several measures are essential to enable audit systems to participate with other relevant agencies in evaluating the efficiency and effectiveness of government projects and programmes. Primarily, budgeting has to provide a foundation for the audit of performance. Planning and budgeting have to formulate clear targets and specific efficiency goals against which performance can be measured. A comprehensive methodology of evaluation incorporating targets, efficiency goals, and target efficiency-related reporting and analysis needs to be developed to facilitate the audit of performance and to link it more closely with programme and project implementation. Agencies engaged in planning,

budgeting, accounting and auditing have to collaborate in jointly defining the underlying concepts and units of measurement. They have to agree on their respective roles in performance audit and on the linkages between internal and external audits.

A sound public financial management system must be supported by an appropriate audit system which will determine how public financial and other resources have been used, evaluate the results achieved with those resources and verify compliance with legal, accounting and administrative provisions and procedures. An integrated public financial management and auditing system is essential to sustainable economic growth and the strengthening of democracy. It ensures that the government will obtain the necessary resources while satisfying the collective needs of the population through efficient, economical and effective use of these resources. It strengthens democracy by fostering accountability of government officials and promoting the credibility of the government through transparency.

Supreme Audit Institutions (SAIs), as national external audit bodies are generally referred to, may have to cope with several problems, firstly, limited support from legislative bodies to whom they report, secondly, weak legislative audit mandates, thirdly, insufficient independence, fourthly, incomplete access to information, and lastly, inadequate financial, human and other resources to carry out their mandates. While developing and transitional economy countries are undergoing dramatic internal reforms, it would be necessary to re-evaluate the role of SAIs in times of rapid and unrelenting change. Many SAIs are still heavily involved in traditional compliance, financial and transactional auditing and have not yet considered or adopted broader-scope auditing. Most have not yet adopted technological tools, such as, Computer Assisted Auditing Techniques (CAAT), statistical sampling, or risk-based approaches.

Auditing contributes to the change and reform process and to improving the public sector management. Audit reports identify instances where laws and regulations have not been complied with, where financial systems need strengthening and, in some cases, where value-for-money has not been achieved. Increasingly, audits are reporting recommendations on what actions need to be taken by government officials to rectify reported deficiencies. A benefit of including recommendations is that they serve as a basis for subsequent follow-up, to ensure that reported weaknesses are not repeated. By reporting weaknesses found and their impact and consequences, SAIs serve to inform governments of appropriate management practices and improvements in accounting and financial management systems. The

fact that selected government operations may be audited tends to act as a deterrent to inappropriate behavior at the administrative level and thus acts as a check on the unbridled powers of government authorities. While the deterrent effect is difficult to prove, or measure, the fact that the work will be subject to audit or review will tend to contribute to greater care in decision making.

The role of SAIs in fighting corruption and financial mismanagement cannot be underestimated. Evidence shows that corruption increases income inequality and poverty through lower economic growth, poor targeting of social programmes, lower social spending, unequal access to education and higher risk in investment decisions of the poor. Corruption has hampered the growth of competitiveness, frustrated efforts for poverty eradication, lowered public spending and investment and undermined the performance, integrity and effectiveness of government institutions. In many developing countries, development programmes and projects of large magnitudes in the infrastructure sector undergo time and cost overruns resulting in serious loss to the government. An effective and efficient audit organization can detect the causes of such costly delays and identify persons responsible. Supreme Audit Institutions can recommend practical approaches to bring about effectiveness and improvement in institutional frameworks, devise strategies to check improper use of discretionary authority and suggest remedial measures to prevent recurrence of such costly mistakes resulting in loss to the Exchequer.

Measuring the efficiency of government expenditure

Developing and transitional economy countries incur public expenditure in providing certain goods and/or services to their populations, to achieve various socio-economic objectives. The efficiency with which these goods and services are provided is very important in macro-economic stabilization and economic growth. Governments which produce more of these outputs while spending less on inputs will be considered as more efficient than those governments which produce less outputs and use more inputs, other things being equal. In a regression analysis that related government consumption to the rate of economic growth, the optimal size of the government was estimated at an average of 23 percent of GDP (Karras, 1996). This study also found that government services are over-provided in Africa, under-provided in Asia and optimally provided elsewhere. On the other hand, Tanzi and Schuknecht (1997) found that the increase in public spending in many industrial countries since 1960 has been excessive in relation to its impact on social

welfare, as measured by certain economic and social indicators. Another important study carried out by the IMF regarding cross-country comparison of the efficiency of government expenditure on education and health in 38 countries in Africa during 1984-1995 proved that increasing budgetary allocations for education and health may not be the only or most efficient way to increase education and health output, and more attention should be given to increasing the efficiency of expenditure (Gupta et al, 1997).

Approaches for measuring the efficiency of government expenditure have been put forward in the economic literature, along four lines. First, studies have concentrated on gauging and enhancing efficiency in practical applications, often focussing on certain types of government spending in a specific country; second, the efficiency of government has been addressed in quantitative terms, using data on inputs of government spending but not on outputs; third, some studies have assessed the efficiency of public spending using outputs but not inputs; and fourth, other studies have looked at both inputs and outputs. But these studies have not made a consistent comparison of the efficiency of government spending among countries. The interest in gauging and enhancing government efficiency led to the initiation of wide-ranging institutional reforms by the Government of New Zealand in the late 1980s aimed at improving the efficiency of the public sector. The central theme of these reforms was to separate policy formulation from policy implementation, create competition between government agencies and between government agencies and private firms, and develop output-oriented budgets using a wide array of output indicators. One reform objective was to transform government institutions to reflect the distinction between outputs - the goods and services produced by the government - and outcomes - the goals that the government wants to achieve with the outputs. Elements of this approach have been adopted by many countries and the theory and practice of result-oriented public expenditure management has generated a wealth of information on how to control production process within the government and how to enhance their efficiency (OECD, 1994).

In relation to the measurement of efficiency of public commercial and industrial enterprises, whether carried on through government departments or as autonomous public corporations, there should be clear guidelines on the objectives to be attained at both the sectoral and plant levels. Productive efficiency is a pre-requisite for profitability. Precise guidelines should be provided at the plant level and should indicate the goods and

services in respect of which subsidies are warranted on grounds of social welfare considerations. Such guidelines should be consistent and apply equally to both public and private enterprises producing the same goods and services. Pricing policies should cover the costs (operating costs, depreciation, interest, etc.) and, where feasible, aim at maximizing profits. Through linkages, public enterprises involved may induce private sector initiative and investment and an accelerated growth of backward areas.

Rather than concentrate on either inputs or outputs, the analysis of efficiency may use information contained in both inputs and outputs and consider the question whether the same level of output could be obtained with less input, or equivalently, whether more output could be generated with the same level of input. In considering the question of efficiency of government expenditure on education, it was found in most studies of developing countries that teacher education, teacher experience and the availability of facilities have a positive and significant impact on education output, that the effect of expenditure per pupil is significant in half the studies, and the pupil-teacher ratio and teacher salary have no discernible impact on education output (Harbison and Hanushek, 1992). Recently, a study was conducted to assess the incremental impact of public spending on social and economic indicators, for example, real growth and the mortality rate, in industrial countries. From a comparison of social indicators in countries with varying income levels, it concluded that higher public spending did not significantly improve social welfare. The IMF study revealed that improvements in educational attainment and health output in Africa and the Western Hemisphere are feasible by correcting inefficiencies in government spending on education and health. For example, relatively low allocations for primary education or relatively higher allocations for curative health care, or directing most benefits of such government spending to higher income groups is symptomatic of expenditure inefficiencies. There is need to exercise caution in increasing budgetary allocations for education and health.

The efficiency ranking of countries, including those eligible for relief under Highly Indebted Poor Countries (HIPC) initiative, indicates that the level of government spending alone is not sufficient for achieving higher social indicators. The IMF study came to the conclusion that the productivity of government spending on education and health has improved over time in Africa, although the average level of efficiency has declined in comparison with Asia and the Western

Hemisphere. The results also indicate that the degree of inefficiency is higher at higher levels of per capita spending. The study has clearly pointed out that merely increasing budgetary allocations for education and health may not be the only or the most effective way to increase education and health output and that more attention should be given to increasing the efficiency of expenditure.

Government expenditure arrears and their solution

There have been several instances where governments coming out of periods of economic turmoil or upheaval, namely, hyper inflation of late 1980s in Latin America, notably Argentina, or the collapse of the centralized economies of the Baltics or the former

USSR, have experienced serious difficulties in meeting the liabilities arising out of public expenditure commitments on due dates giving rise to the build-up of government expenditure arrears. These arrears have implied government delays on payments for services rendered, goods or services supplied and legally mandated unilateral transfers, such as pensions and allowances. Such outstanding arrears are clearly the result of the failure to make proper revenue projections or such revenues properly projected or anticipated have not arisen due to situations beyond the control of government or significant failures in important segments of economic activities.

In the 1990s most countries undergoing the transition from centrally planned to market economies have experienced resource constraints which were exacerbated by serious reduction of income and output. This often led to the emergence of expenditure arrears. Expenditure arrears of staggering proportions have been noticed in the former Soviet Union countries, resulting in most cases in erosion of trust in public institutions, seriously affecting the social fabric and undermining all the possible beneficial gains due to economic stability achieved so far. Table 3 shows the seriousness of the problem.

Table 3. Consolidated general government's stock of arrears

(In percent of GDP)	1995	1996
Moldova	7.8	11.0
Tajikistan	10.3	5.0
Kazakhstan	n.a.	5.4
Ukraine	1.2	4.6
Uzbekistan	0.8	3.6
The Russian Federation	n.a.	3.0
Kyrgyz Republic	1.9	0.9
Georgia	0.4	0.6
Belarus	2.1	n.a.
Armenia	0.9	...
Azerbaijan*	2.6	0.5
Turkmenistan	0.0	0.6
Latvia	0.0	0.0

* Includes only arrears of the Social Protection Fund. Government arrears to suppliers are unavailable but are expected to be substantial.

Source: IMF staff estimates.

Table 4 clearly shows the break-up of the arrears by categories (Ramos, 1998).

Table 4. General government's arrears by category: 1996

(In percentage of GDP)	Wages	Social Sector	Suppliers	Total
Russia	0.5%	0.5%	2.0%	3.0%
Kazakhstan	0.7%	1.8%	2.9%	5.4%
Moldova	1.3%	4.6%	5.1%	11.0%
Ukraine	1.5%	2.2%	0.9%	4.6%

In the context of IMF-Sponsored programmes, performance criteria and indicative targets on phased reductions in both central and local government arrears have been established for countries with substantial arrears, like Moldova, Ukraine and Kazakhstan, accommodated by enlarged cash budget deficit ceilings. These targets have generally led to a reduction of arrears and were even overachieved in one case, Moldova. In countries where the problem of budget expenditure arrears is not so acute, the IMF has instead pressed for quick payment — especially of pension and wage arrears — though re-prioritization and retrenchment or postponement of lower priority expenditure and measures to address the poor budgeting that generated the arrears.

The accumulation of government expenditure arrears results from government having effectively defaulted on its failure to pay the obligation on the due date. This was primarily due to the government using its discretionary powers, unilaterally borrowing from the pensioner, wage earners, energy companies and contractors, etc., without their consent. Since there is no contractual arrangement governing financial dealings between the government and the owners of these claims, most such agents end up with implicit claims on the government for which they have no title, and which may be honored at an unspecified date and for an uncertain value. The current level of the stock of arrears is likely to increase even further if the imbalance in fiscal finances at the flow level - where current revenues fall short of current expenditure commitments - is not addressed. One alternatives to deal with this situation is to repudiate current arrears by announcing that these liabilities will not be honored either now or in the future, an alternative which should normally be discouraged as it has serious economic and political connotations. Some other alternatives are:

- Pay arrears in-kind or through other limited choice mechanisms;
- Issue financing instruments (domestic or foreign borrowing) to pay off arrears; and
- Announce a schedule for repayment of arrears (phased payment).

An examination of several country experiences has shown that securitization is an alternative of choice to clear arrears when governments face constraints on domestic and/or foreign borrowing and as a one-off operation to clear old debts. Moreover, scrutinization can provide governments with temporary reprieve from debt-service obligations, which would not normally be available by floating market debt instruments. The study found that where the first-best solution of immediate payment of these implicit claims is not feasible nor possible, abstracting from political economy considerations on who should bear the burden of fiscal adjustment, it is seen that securitizing these claims can be welfare-improving and reduce distortions associated with the intertemporal allocation of consumption and savings. In most cases, although the claimants had to bear some losses, the utility loss of these agents can be reduced substantially through appropriately designed securitization operations. Countries such as Argentina in the early 1990s had successfully securitized government arrears, and their experiences have paved the way in consolidating public finances and reducing the stock of government arrears.

Conclusion

Public expenditure management has to be considered in the context of the role of the State, good governance, macro-economic policy and the changing environment with reference to information and communication technology. Public expenditure management approaches and recommendations are solidly anchored

on the economic, social, administrative and implementation capacity realities of the specific country. In fact, the public expenditure “technology” will have to be specific in terms of local factor endowments, local institutions and real local needs. Moreover, the important factors for the analysis of applicability are the evaluation of the country’s institutional framework and the availability and reliability of the relevant data and appropriate skills.

The efficiency of public expenditure management is dependent upon the strength and capacity of the institutional framework. The institutional dimension of the budget process is very important, since budgetary outcomes are profoundly affected by budgetary institutions. In developing countries, the “stock” of institutions is larger than is visible in the formal service, which leads to the following basic points, namely:

- A design failure to take into account key informal rules is likely to lead to a failure of the budgeting reform itself;
- Durable institutional change, in general and in public budgeting in particular, takes a long time to be implemented successfully;
- One way to improve the overall institutional framework is to make the informal rules more visible; and
- Although budget organizations and new units can be merged, restructured, recombined and created, but no change in behaviour will result unless basic rules, procedures and incentives also change.

The concept of good governance, which is a cornerstone of effective public expenditure management, encompasses four important attributes, namely, accountability, transparency, predictability and participation. The lack of predictability of financial resources creates difficulties in planning for the provision of services, while predictability of government expenditure in the aggregate and in various sectors will enable the private sector to make its own decisions for production, marketing and investment. Transparency of financial information facilitates the ready access to reliable, comprehensive, timely, intelligible, and internationally comparable information on government activities whereby the electorate and financial markets can accurately assess a government’s financial position and the true costs and benefits of government activities. Accountability, which has two components of answerability and consequences, is needed for the use of public moneys and the results from spending it.

Corruption, often identified with large procurements and major public works programmes, is closely associated with public expenditure management which necessitates improvement in the quality of governance through reduction in opportunities in the process. Corruption weakens fiscal discipline, distorts the allocation of resources, harms operational efficiency and effectiveness and is antithetical to due process. Corruption, which is increasingly being seen as neither beneficial, nor inevitable, nor respectable, is bad for economic efficiency and growth and hurts most the disadvantaged and under-privileged sections of the population.

Since the extent and scope of public expenditure is closely interconnected with the availability and predictability of all forms of revenues, SAIs operating in developing and transitional economy countries have to play a pivotal role in ensuring all forms of government revenues are duly collected in accordance with the due process of law. Supreme Audit Institutions have also to ensure that the verification of public expenditure depends on several factors, namely, support from lawmakers; whether the legal mandate is weak, narrow or with limited human and financial resources; degree of independence from executive; access to information; and insufficiency of institutional support in the form of shortage of trained personnel and professional accountants.

The key objectives of good public expenditure management are fiscal discipline or expenditure control, allocation of resources consistent with policy priorities or “strategic” allocation, and good operational management. Most important, fiscal discipline requires control at the aggregate level, strategic resource allocation requires good programming and which entails appropriate inter-ministerial arrangements and operational management is largely an intra-ministerial matter. These three objectives of good public expenditure management can be symbolized as a triad of fiscal objectives. Fiscal discipline results from good forecasts of both revenue and expenditure, strategic allocation has its counterpart in tax incidence across different sectors and effective and efficient tax administration is the revenue aspect of good operational management of expenditure. In essence, good operational management requires efficiency, i.e., minimizing the cost per unit of output and effectiveness or achieving the optimum output and the outcome for which the output is intended. In short, efficiency in public expenditure management enures to the increased socio-economic welfare of the population.

Endnote

¹ Hart, Shleifer and Vishny (1996), present a model where contract incompleteness affects a government's choice whether or not to privatize an activity, with an application to prisons.

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Appendix

AGENDA

Ad Hoc Expert Group Meeting on Patterns and Trends in Public Expenditures and Their Implications for National and International Development Strategies

United Nations Headquarters
New York, 8-10 June 1999

Tuesday, 8 June 1999

- 9:30 am Welcome Address, Mr. Guido Bertucci, Director, Division for Public Economics and Public Administration/United Nations Department of Economic and Social Affairs
- 9:45 am Introduction, Mr. Albrecht Horn, Deputy Director, Division for Public Economics and Public Administration/United Nations Department of Economic and Social Affairs
- 10:00 am “The Size of Government: Changes in the Perceived Roles of and Trends in Overall Public Expenditures,” presentation by Mr. Robert Gillingham, International Monetary Fund
- 11:00 am Break
- 11:15 am Comments and Discussion
- 12:15 pm Lunch Break
- 2:00 pm “Defense Expenditures in NATO and former WTO Countries,” presentation by Mr Gordon Adams, Deputy Director, International Institute of Strategic Studies
- 3:30 pm Break
- 3:45 pm “Defense Expenditures in the Latin American Region,” presentation by Mr. Eugenio Lahera, United Nations Economic Commission for Latin America and the Caribbean
- 5:15 pm Close of Session

Wednesday, 9 June 1999

- 9:30 am “Social Security,” presentation by Mr Larry Willmore, United Nations Department of Economic and Social Affairs
- 11:00 am Break
- 11:15 am “Education,” presentation by Mr James Tooley, University of Newcastle
- 1:00 pm Lunch Break
- 3:00 pm “Targeted Social Expenditures,” presentation by Mr Albrecht Horn, United Nations Department of Economic and Social Affairs
- 5:00 pm Close of Session

Thursday, 10 June 1999

- 9:30 pm “Public Expenditures on Infrastructure in Developing Countries,” presentation by Mr. David Aschauer, Bates College
- 11:00 pm Break
- 11:15 pm “Public Expenditures on Research and Development,” presentation by Mr. David Gold, United Nations Department of Economic and Social Affairs
- 1:15 pm Lunch Break
- 3:00 pm “Expenditure Process Reform,” presentation by Mr Suresh Shende, United Nations Department of Economic and Social Affairs
- 5:00 pm Summary Discussion
- 5:30 pm Close of Expert Group Meeting

