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ABSTRACT

The South Australian State Department of Education, Training and Employment allocates funding to schools in much the way that the literature suggests is a generic basis for funding schools. This includes per school base funding, per student funding for all students, additional per student allocations based on year levels, and additional per student allocations based on learning needs of students. An analysis of departmental ledger information for the 1997/98 financial year established the department's implicit policy of allocating resources within country and metropolitan schools. It is clear that the basis for allocating resources at the system level is not congruent with how schools themselves allocate resources. The particular policy implication of this mismatch for rural schools relates to the allocation of resources to senior secondary students. The system assumes that senior secondary students require significantly more resources than schools actually allocate. Schools reallocate these surplus resources back to junior secondary students in both country and metropolitan areas. Country schools tend to have relatively lower retention to year 12 and thus have less surplus resources to reallocate compared to metropolitan schools. (Contains 19 references.) (TD)

The Real Cost of Rural Schooling in South Australia From a System's Perspective

Mark Witham, Australia

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Introduction

This paper examines the costs of rural schooling in South Australia by examining systemic data using a statistical approach. The specific research questions are:
How does the State Department of Education, Training and Employment allocate funding to schools?
What are the relative payments to different schools and communities?
How do the mechanisms and implicit policies meet the criteria of cost efficiency and vertical equity?
A second issue was whether the way that secondary schools allocate resources is congruent with how the Government allocates resources to schools.
This study is one of three separate studies undertaken as part of the Author's PhD thesis. One of these separate studies examines the allocation of resources from a school's perspective. It shows the implicit policy of allocating resources within country and metropolitan schools. It is clear that the basis for allocating resources at the system level is not congruent with how schools themselves allocate resources. The particular policy implication of this mis-match for rural schools relates to the allocation of resources to senior secondary students. The system assumes that senior secondary students require significantly more resources than schools actually allocate. Schools re-allocate these surplus resources back to junior secondary students in both country and metropolitan areas. Country schools tend to have relatively lower retention to year 12 and thus have less surplus resources to re-allocate compared to metropolitan schools.

Literature

Introduction

Caldwell, Levacic & Ross (1999,pp.20-24) put forward four generations of funding formula that have been used to provide resources to Government schools. These are:
First generation funding formula were simple pupil/teacher ratios supplemented by per pupil grants. These formulae assumed that all students had the same learning needs and hence only achieved horizontal equity. Caldwell et al assert that this type of crude formula could be usefully applied in developing countries.
Second generation funding formula were developed to take into account that all students are not the same, with different learning needs requiring greater levels of resourcing. These formulae included a per-capita amount for all students plus an additional amount for students with particular learning needs. Caldwell et al point out that the additional needs-based amount was not determined by any consideration of what these students required to achieve a particular level of attainment - they were simply politically determined amounts distributed according to an index based on some statistical measures of learning needs. This point could equally be made about the per-capita amount for all students. Reschovsky & Imazeki, (1997) also found that "*as far as we can determine, the process of determining the weights assigned to low-income children often reflect political considerations rather than estimates of the true costs of educating children from economically disadvantaged families*".
Third generation funding formula have the characteristics of comprehensiveness (inclusive of all costs of educating students at the school level), cost-based (related to the costs of providing specific programs for students with different learning needs) and incentive appropriate (encourages schools to act consistently with Government policy objectives).
Fourth generation funding formula have the characteristics of third-generation formula, but ensure that like students are funded the same regardless of the school they are in. They also relate the funding to learning outcomes.

Government Education in South Australia is currently in the process of moving from a second generation to a third or perhaps fourth generation formula.

Inputs and Outputs

It seems that between the first and second generations there is a shift from input to output funding. This is a major change in educational funding, which is in line with Government budget reform that has occurred in almost every Australian State and overseas. The reform is often associated with a shift to smaller central agencies and a clear separation between Funder, Owner, Purchaser and Provider functions of Government. In education the schools are the provider, the small core central agency is the purchaser and the Government with an appropriate Minister as its agent is both Funder and Owner.

The Government typically sets high-order policy objectives and funds these at the political level of

Minister and Treasurer. The funding is then used by the core central agency to purchase outputs form the providers. In the case of education the output is 'students taught'. This is an important point, no longer does Government purchase inputs such as teachers, goods and services. At one level it does not really care about what inputs are used - only that the outputs defined **as the services which the end-consumer receives** are produced to an agreed level of quality. The Government may include in its definition of quality a particular ratio of pupils to teachers, which does ultimately specify the mix of inputs.

In the Funder-Owner-Purchaser-Provider (FOPP) model, the high-order policy objectives set by Government are not the responsibility of the agency to achieve. The agency is only accountable for delivering the outputs to an agreed level of quality. In education this means that the Education Department is accountable for educating students and ensuring that they reach a given level of attainment or achievement. The Government is accountable for whether the strategy of funding education actually achieves future benefits to society. This separation of accountabilities is illustrated by the 'accountability line' in the following figure 1.

The accountability line divides what are the responsibilities of the Funder/Owner (the elected Government) and the purchasers and providers (Government Education Authority/Government Schools). The indicators of Cost, Quality and Efficiency are common measures of the performance of Government Schooling and the indicator of effectiveness a measure of the performance of Government. More realistically perhaps the latter is a measure the Government uses to compare the strategy of funding education with other policy options that may achieve the same benefits to society. These other options might include funding less education and legislating or spending in other policy areas of Government. It should be noted that there are other views that differ from this model. A common view is that the cost measure is an indicator of efficiency (SA Department of Treasury and Finance, 1999) and the efficiency measure is an effectiveness indicator. With such an approach the relationship shown as effectiveness in the above diagram is sometimes ignored and other times included as a second effectiveness Measure. The problem with this approach is that it assumes no qualitative difference between a class size of 10 or 200 students. It appears that those advocating such an approach are simply transposing models developed in other areas of the economy including government activities such as public transport and water supply. The transposition may be a standardised process without consideration of any differences between education and other sectors of Government.

The accountability line can also be considered as the "leap of faith line", where one has to leap many years and possibly several generations to determine whether the investment in education does in fact achieve the long term objectives which the Government intended. It seems that many researchers of the various aspects of production functions are prepared to take the leap of faith.

Under the FOPP model the Government funds central agencies to purchase a specified amount of outputs. It uses a funding agreement and a price per output is included in this document. In the absence of an educational market, the price paid by the Government for the output of students taught is based on the cost.

The agency can not defend some of the input based funding policies in its negotiation with Treasury and the Government. It can not for example defend minimum provisions, maximum provisions nor threshold provisions inherent in many of the current input based allocations. In its simplest form the funding agreement between the Government and the Education agency will be based on the formula:

X students x $Y average expenditure per student = $total recurrent funding.

Output Models

The literature describing what the second and third generation funding formula should look like appears to be converging on a single generic approach as follows:
Per-school base funding
Per Student funding for all students
Additional per student allocations based on year levels
Additional per student allocations based on learning needs of students

This generic model is put forward by Odden and Busch (1998, P.157) in their 1998 summary of best practice educational resource allocation from around the world. One of the systems Odden and Busch examined in detail was the Victorian Education Department in Australia. The generic model above does not include the priority programs category included in the Victorian global budget. The Tasmanian Global budget formula (which excludes staffing resources as these are allocated on an input basis) has the same categories as the best practice model above (1993, p.65).

Principles

"*Five values or objects of policy that have been historically prominent in shaping Western societies and are also particularly relevant to making decisions about the provision and consumption of educational services are liberty, equality, fraternity, efficiency and economic*

growth." (Swanson and King, 1991, pp.22-3 cited in Caldwell, Levacic & Ross, 1999, p.12) Caldwell et al, link these values to funding schools. Liberty is interpreted as choice and diversity of Government schools available to students. Equality relates to horizontal equity such that a particular type of student should attract the same funding regardless of which school they are in. Fraternity means that all types of students are welcome in any school regardless of their background or disability. Efficiency simply means either providing the highest possible output with a given input or the least cost provision of a given output. Economic growth means that the students leaving the education system should have certain knowledge, skills and attitudes, which are inducive to economic growth.

The Education committee in Victoria (Education Committee, 1996) established high-order principles to guide the development of the global budget. These were:

Pre-eminence of educational considerations (Determining what factors ought to be included in the construction of the School Global Budget and what ought to be their relative weighting are pre-eminently educational considerations.)

Fairness (Schools with the same mix of learning needs should receive the same total of resources in the School Global Budget.)

Transparency (The basis for allocations in the School Global Budget should be clear and readily understandable by all with an interest. The basis for the allocation of resources to each and every school should be made public.)

Subsidiarity (Decisions on resource allocation should only be made centrally if they cannot be made locally. Decisions on items of expenditure should only be excluded from the School Global Budget if schools do not control expenditure, if there is excessive variation of expenditure, if expenditure patterns are unpredictable, if expenditure is once-off, or for expenditure for which schools are payment conduits.)

Accountability (A school which receives resources because it has students with a certain mix of learning needs has the responsibility of providing programs to meet those needs, has the authority to make decisions on how those resources will be allocated, and should be accountable for the use of those resources, including outcomes in relation to learning needs.)

Strategic implementation (When new funding arrangements are indicated, they should be implemented progressively over several years to eliminate dramatic changes in the funding levels of schools from one year to another.)

Methodology

Financial Analysis and Regression Analysis of State Funding to Government Schools

A very detailed analysis of Departmental Ledger information for the 1997/98 financial year was undertaken to establish the Department's implicit funding policies. This involved mapping expenditures by project, cost centre and Director. All expenditures that were recorded as being expended in school cost centres were allocated to the school. Expenditures incurred in cost centres other than schools were allocated to various support services, other outputs such as TAFE and preschools and to capital investments.

The analysis of actual expenditure represents the implicit funding policy in 1997/98 financial period. The model used to analyse the implicit funding policy is shown in Figure 3.

Analysis of Implicit Funding Policy Using Multiple Regression Analysis

Actual Expenditures and Actual Teacher Salaries

The expenditures directly relating to schools included actual salary payments and reflected the lower salaries paid to generally younger teachers in country schools. In the work of Monk et al (1996) both actual and State-average teacher salaries were used to determine whether differences in the funding to different school districts were due to actual salary differentials or to class size differentials. They found that salary differences partly explained the differences, but that differences within a school or a district were explained by class-size differentials. This study also investigates the implicit funding policy for schools using actual and average salaries to determine the impact on differences in funding between metropolitan and country schools.

The expenditures recorded at individual schools excluded capital expenditures but included 'one-off' arrangements and special deals that are not part of the main funding policies of the department. The basis for the allocation of expenditures directly to schools included a large range of different funding mechanisms. The methodology examined the different mechanisms including the 'one-off' arrangements to determine the underlying factors within each formula. These factors included student numbers, student background, student year levels, and school type. The total expenditure recorded at each school was compared to statistics for each of these factors at all schools using the statistical technique of multiple regression. The SPSS software package was used to undertake this analysis. The fact that most resource allocation formulae in place were linear in that they related resources provided to the number of students in each school lead to the choice of multiple regression analysis as a tool to discover the statistical nature of this relationship. For each school we had a known outcome (the total expenditure) and a range of known predictors (number of students in each year level, number of aboriginal students, number of school card recipients etc.) The multiple regression analysis sort to establish a system-wide implicit policy

for resource allocation. To do this the data for all schools was analysed as one data set. Another option would have been to analyse country schools and metropolitan schools separately, to determine whether there were any significant differences. This was not done because almost all of the likely factors that would impact on the amount of resources provided to rural schools were universally applicable to all schools. This means that small metropolitan schools also relatively high expenditures as did small country schools. The fact that more of these schools were located in the country means that overall the country schools receive greater per-capita funding. This is due to an underlying policy relating to population dispersion and school provision. Similarly the younger teachers typical in country schools result in generally lower expenditures on a per-capita basis - and metropolitan schools with younger teachers would be treated the same. The exceptions to this 'equal treatment' approach to metropolitan and country schools allocations are very small in magnitude. They include the Country Area Schools Program amounting to $1.3m.

Findings

What mechanisms are in place that the State Agency uses to transfer resources to the schools? and what are the actual amounts?

In 1997/98 the department's total expenditure was $1.6bn. This expenditure was allocated to the outputs of Children's Services, Government Schooling and Vocational Education and Training. Government Schooling represented 76% of the total spending. The first implicit policy decision by the agency is how much of the total available funding should be allocated to each of these major output classes.

Within the 76% or $1.2bn that was allocated to school education about $927m was directly allocated to schools and $296m was spent corporately on behalf of schools. The mechanisms for allocating the $927m to schools are complicated and numerous. They interact with each other so that the final allocation policy is far from transparent. The following analysis made the implicit policy of resource allocation visible for the first time. It raised the questions of what educational rationale existed for the allocations to particular groups of students, year levels and school types.

As the Department for Education Training and Employment only formed in 1997, it has not yet had the opportunity to evaluate whether this particular allocation policy was the most effective use of $1.6m or whether alternative allocations would produce better community outcomes. If the relative allocations to these major areas of activity are not deliberately considered and perhaps challenged, the historic "what has always been" remains the implicit policy. (Note: in addition to the $2.5m provided to Private Schools from the Budget for Government Schools there is an additional $250m provided via a Ministerial Secretariat.)

Resource Allocation Directly to Schools

Within the 76% of spending on R-12 Education $927m was directly allocated to schools and $296m was spent corporately on behalf of schools. The policy on how the $927m was allocated is contained literally in a book (the staffing formula) and in various other files. Whilst these mechanisms were complex and numerous it was possible to summarise them into a quite simple form by the use of regression analysis.

This statistical technique compared the expenditure to the following features of each school for the financial period 1997/98:

School Type
Number of Children in years R-2
Number of Children in years 3-7
Number of Children in years 8-10
Number of Children in years 11-12+
Number of Children who are also Aboriginal or Torres Strait Islanders
Number of Children who are also school card recipients
Number of Children with disabilities who are integrated into mainstream classes
Number of Children with disabilities who are in special classes
Number of Children who are from Non-English Speaking Backgrounds
Measures of rurality.

This analysis provided an extremely good statistical explanation of how resources were allocated. The analysis also investigated whether the country/metropolitan location of the school made any difference to how resources were allocated and it had no statistical impact. Two measures of rurality were used in separate regression analyses, the Departmental definition of country/metro and the GSAF. Neither measure was statistically significant. This did not mean that country schools received the same funding as Metropolitan schools but rather that the reason why country schools got relatively more funding was due to factors such as school type (particularly the large fixed base allowance for country R-12 schools and smaller enrolments. Additional funding was not allocated for reasons of geographic isolation.

Area (R-12) schools attracted a larger base "per-school" funding than the sum of the per-school bases for a primary school and a high school. This higher base or per-school funding was spread over fewer students so the per-student funding in country schools was higher than in metropolitan schools. This could be a reflection of the additional expenditure that was provided to country areas through the Commonwealth's Country Areas Program, Ready Set Go (VET in schools funding), and possibly the Department's freight grant. This latter grant has almost no relationship to the freight costs of a school and in 1995 the Department introduced a state-wide courier service that essentially equalised country

freight expenditures to that of metropolitan schools - effectively rendering the freight grant redundant.

The decision as to which variables should be included as part of the existing implicit resource allocation was ultimately made on an objective basis by iterative use of the regression analysis to find the variables which gave the highest statistical correlation with expenditure or the "line of best fit". In statistical terms an adjusted R square figure of 0.96 was achieved, which is almost perfect correlation. This better than anticipated result was almost too good to be true and would normally occur through an unintended data error. However the entire analysis was independently vetted by Dr. Sheldon Rothman the Department's Chief Statistician who confirmed the figures. The statistical analysis revealed the following:

Whilst such a high correlation is unusual, it occurs due to the fact that almost all of the expenditures on each school were formula-based and these formulae were in turn based on the factors used in the regression model. The 4% of expenditure not explained by the model included some data errors where a small number of schools had very large expenditures recorded in the ledger as maintenance, which were associated with major capital redevelopments. A second reason for the unexplained variance is that the model did not include a variable for salary step in the teacher pay-scales. As such the model allocates average salaries, while the ledger records actual salaries. This issue is revisited later in this chapter, when the entire regression analysis is repeated using average salaries.

What is the implicit policy?
The outcome of the statistical analysis was an implicit resource allocation formula as shown in Figure 7.

These figures were re-presented to a formula that had the following major features .
A fixed Base allocation for each school that did not change with enrolment. This in effect related to the fixed component of all major inputs. (Salaries included a Principal, and groundsperson , the school support grant had a fixed base, utility charges included a fixed rental amount etc.)
An additional allocation for each school that did not change with enrolment and was based on school type.
A per-capita base allocation that was allocated for every student.
An additional per-capita allocation for particular students based on their year of study
An additional per-capita allocation for particular students based on some other student-related statistic such as their aboriginality, or whether they were school-card recipients.
This new presentation is shown in figure 8.

This model makes explicit the relative importance that each compensatory funding bucket had at the time and we can see at a glance what additional resources were provided to students in special classes or to year 10 students for example. It also begged many questions such ***as what was the policy rationale for these allocations?*** and ***did these allocations reflect sound educational research findings and practice?***
This formula had the potential to replace the plethora of then existing allocative mechanisms and achieve at least 96% of the same outcome.

The high amount of additional resources provided to years 11 to 12+ was surprising and resulted in some detailed rechecking of the analysis, (which was again found to be correct). Why did Years 11 and 12 attract more than double the total per-capita resources that years 8 to 10 attracted? The reasons are a compounding of the following factors:
Slightly higher denominator in the staffing formula 29 in years 8-10 rather than 26 in years 11-12
Slightly more generous Non-Instruction Time Allowance (18% rather than 15%)
The allocation of relatively more of the per-capita support grant to part-time than full-time students
The allocation of staff on the basis of February enrolments when a significant number of students leave during the year. The statistic used in the regression analysis is the average of June 1997 and February 1998 full-time enrolment. It is acknowledged that the average of February and April Enrolments is used to allocated staff to secondary schools with total enrolment greater than 300. Primary schools are staffed on a term by term basis to reflect the reality of increasing enrolments through the year.
These features of the staffing formula are amplified by the allocation of SSO salaries, professional development grants and furniture grants on the basis of teacher numbers.
Potentially more teachers at the higher end of the salary scales, reflecting more senior staff and more experienced staff.

When this feature of the allocative methodologies was shown to officers in the Department, one secondary principal pointed out that in his school these resources although provided for year 12 were actually used to teach earlier years of schooling. A similar response came from a former school principal working in the Human Resources Policy area. This view was supported by analysis undertaken within 4 schools in 1993 as part of the Junior Secondary Review (Witham, 1993), which found that in 3 of 4 schools with secondary enrolments, years 11 and 12 resources were allocated back to years 8,9 and 10. The exception was an area school, which didn't enjoy the good fortune of a large senior secondary enrolment and so could not reallocate these additional resources to the junior secondary years.

In the 1960s when enrolment in year 12 was much lower, the curriculum was narrower and when students were not treated as much as independent learners, this policy might have been appropriate. Officers in the Department's human resources policy area were able to point to a specific officer responsible for the policy that was developed in the late 1960s. In 1998 the very small year 12 physics classes are now supplemented by a range of larger classes and in very many schools year 12 students have 20% of their timetable unsupervised.

System Expenditure on Behalf of Schools

In 1997/98 the following expenditure was incurred corporately on behalf of schools:

On top of these expenditures there was an additional $117.6m of expense which related to depreciation of school buildings and major capital upgrades of school buildings. Figure 10 shows how total
resources are allocated to the outputs of Government schooling, Vocational Education and Training and Children's Services (preschool and childcare).
Figure 11 shows that it has been possible to deconstruct the total school expenditure into a base for all students, a base for all schools (per-school allocation), additional per-capita allocations to schools and other corporate expenditures made on behalf of schools. The expenditures in figure 11 have be ordered into priority to understand the relative magnitudes of each component of funding in the School Expenditure Pyramid in Figure 12. This pyramid shows the relativities between the base and the various compensatory and year-of-study based allocations.

How do the mechanisms and implicit policies meet the cost efficiency and vertical equity criteria?

Cost efficiency
Earlier the issue of year level funding allocations was highlighted and related back to policy decisions made in the late 1960s. While it is easy to rationalise this anachronism of the staffing formula away, by saying that schools can reallocate to earlier years, it is not equitable to those schools (particularly those in the country) who do not have high enrolments in year 12. Some country schools have no year 12 classes and perhaps this is a cycle in part caused by there being relatively less resources available in years 8-10. In any resource allocation methodology it is fundamental that resources be directly allocated to where they are needed and not to somewhere else with the hope that they will then be re-allocated.

Later in this chapter the actual year level funding relativities for eight case study schools are discussed. It is apparent from this analysis that the internal re-allocations by both metropolitan and country schools are significantly different to those implicit in the Departmental allocative mechanisms as shown in Figure 13

Figure 13 Presents evidence of two mis-allocations of resources that may indicate that the cost efficiency criterion is not being met. Firstly the allocations to year levels do not accord with school practice nor the educational theory relating to year level funding discussed at length earlier in this paper. The second issue is that there are apparent differences in how country and metropolitan schools allocate resources internally, that are not reflected in the resource allocation methodology. The numerous resource allocation mechanisms briefly mentioned are themselves indicative of an inefficiency in the actual allocation methodology. As shown in figure 11 there are significant out-of-school expenditures related to the different funding components. For example the Aboriginal Education and Disability Services areas provide some services directly to schools but also include significant central office bureaucracies. This represents a leakage of funding away from the students that the funding is targeted to. This issue is taken up again in the next section.

Vertical Equity
Figure 14 is a conceptual diagram of equity funding, where every student receives a base per-capita funding of ***A*** and students who meet a needs criteria of greater than point 1 receive increasing amounts of equity funding. For simplicity suppose that student need translated into lack of wealth - students at point 0 are very wealthy and thus get no needs funding. Students at point 1 are moderately wealthy and also get no needs funding. Students to the right of point 1 are in increasing need and get progressively more funding. Whilst this model is a straight-line simplification of the range of different needs that exist within education it is a useful starting point to discuss the implications for resource allocation.

Where we locate points ***A, B & C*** are policy decisions for which the range of statistical measures such as the Griffith Service Access Frame (GSAF) and the ABS measures of poverty provide no clues at all. Perhaps all students have some degree of need and point ***B*** should be located at point ***A*** or even at point ***0***. Perhaps the base funding is too generous and over-resources the most wealthy students at the expense of the least. Perhaps the students in most need are not adequately funded and point ***C*** should be higher - given a fixed total basket of resources this means that we can either reduce the base below point A or increase the needs threshold beyond point ***B***. The concept of compounding disadvantage where a critical mass of students in one or more needs categories are in the same school could be accomodated within this approach by the development of a non-linear function so that the line BC is convex. The

measures of socio-economic disadvantage used in the Department's equity funding formulae were based on either the percentage or number of school card recipients.

To redraw the funding model based on the school card measure it would look like figure 15. Students are either school card recipients or not, which does not reflect the continuum of need that exists. One defence that is put forward for the school card model is that the commonwealth literacy program funding is allocated to schools with more than 60% school card recipients in its enrolment. A school with 61% school card receipients will get funding even though the students may have only just qualified for a school card. On the other hand another school with 100% of students who just missed out on a school card will get nothing. Thus this defense of school card is not a strong one. Figure 15 depicts a student at point 1 attracting a amount of funding B1 which is almost completely mistargeted. The only students getting all the targeted funds are those at point C with the most need. What this illustrates is that approximately half of the $70m funds allocated using school card are mis-directed. This is an issue of concern. If we adopted a continuous measure such as a an ABS measure of Poverty it would free up approximately $35m so that those in most need could get up to double the equity funding they were getting in 1997/98.

Analysis of 1999 Data using a budget and standard cost approach

The regression analysis described so far related actual expenditures in the 1997/98 financial year to the average enrolment in schools in these years. Conspicuous by its absence was the impact of rurality. The rural nature of every school was tested and found not to have a statistical impact. The measures tested included the Departmental measure of Country or Metropolitan, whether a school received Country Area Program funding and the schools score on a statistical index known as the Griffith Service Access Frame. None of these measures had any explanatory power as to the policy basis for allocating resources to schools. Yet it was apparent that the Department did have a Country Areas Program that provided $1.2m to schools on the basis of geographic isolation. This was a relatively small amount in a budget of $927m directly allocated to schools. It was also apparent that country teachers were generally less experienced than metropolitan teachers and on average earned lower salaries. Intuitively this factor would result in funding being less for rural schools, all other things being equal. In 1999 a budget was constructed for all schools using average teacher salaries and entitlements rather than actual expenditures. This separate analysis showed that rural schools were provided with an additional $8m on the basis of rurality. This provides an indication that the implicit policy on actual expenditures includes two opposing forces that cancel each other out. Firstly there is a policy of providing more funding to rural schools on the basis of rurality and secondly there is a policy of providing relatively less funding for teacher salaries because of the lower teacher salaries - and the possibility of higher teacher vacancy rates.

The 1999 analysis has to be interpreted with a degree of caution. Because the analysis was based on budget or entitlements it excludes all expenditures below entitlement and over entitlement. Schools that are more difficult to staff are more likely to have vacancies. This means that an analysis of entitlement figures will overstate the funding provided to more difficult to staff schools. Similarly if some schools are more likely to have higher than average staff absenteeism, the entitlement to teacher relief will understate the funding provided to these schools. It is possible that both of these factors are more prevalent in rural schools.

Summary and Conclusions

The State Department of Education, Training and Employment allocates funding to schools in much the way that the literature suggests is a generic basis for funding schools. That is a:

Per-school base funding

Per Student funding for all students

Additional per student allocations based on year levels

Additional per student allocations based on learning needs of students.

This paper presents this implicit funding policy for South Australian schools for the first time. It shows that the year level allocations are counter to the universal consensus in the research literature. That is senior secondary funding is a priority at the expense of junior primary funding.

The funding for rural schools is overall not statistically significant although it is possible that this outcome masks two opposing factors. Not with standing this possibility the analysis shows the funding provided to schools on the basis of aboriginality and relative poverty, quite separately from that provided for rurality. The funding provided for 'per-school' allocations are the same for country and metropolitan schools. When these fixed amounts are divided by the generally smaller enrolments in country schools it results in higher per-student funding for rural students. This is not because they are rural but because rural students are often in areas with highly dispersed populations. Thus whilst rural schools may receive greater levels of funding on a per-student basis compared to metropolitan schools, this is due to underlying differences in socio-economic status and population dispersion.

It is apparent that the school card measure used as a proxy for SES status does not ensure vertical equity of

allocations to those most educationally disadvantaged students.

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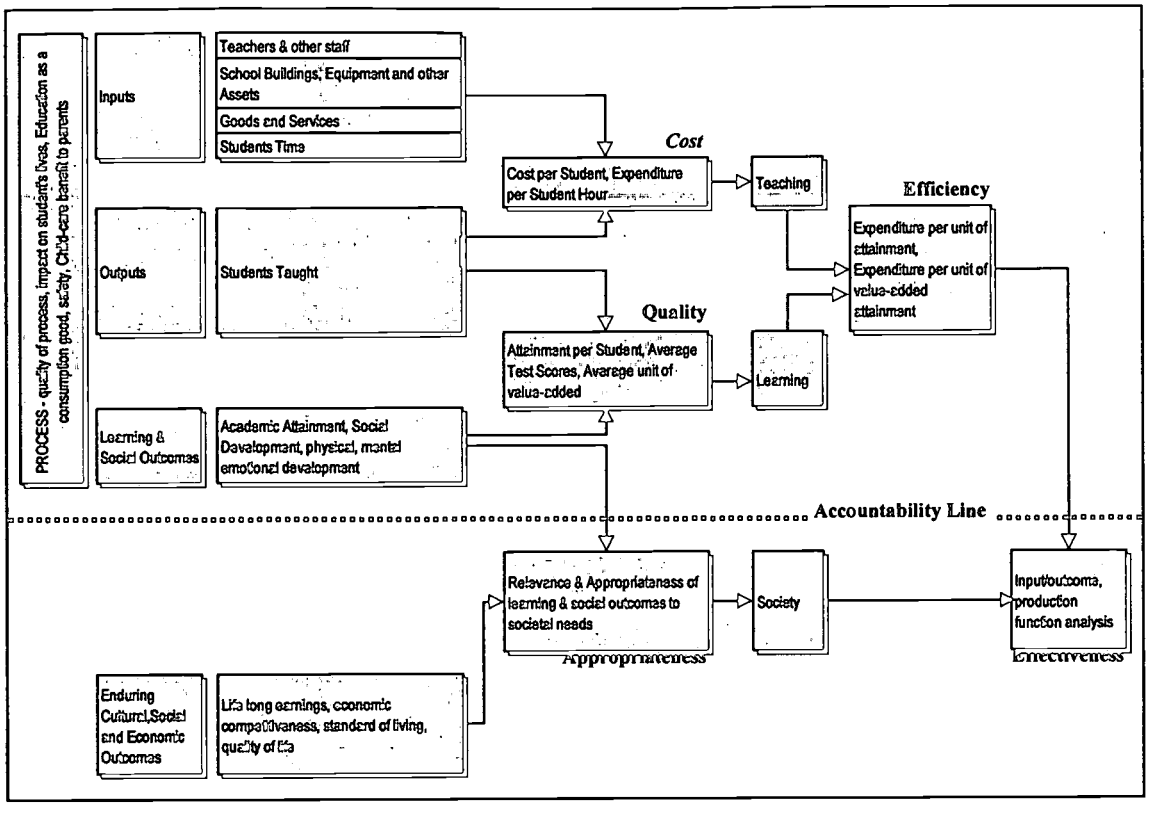
Figure 1 The Accountability Line



Source: Witham adapted from program logic model (Ince, 1993; Duckett, 1998). Appropriateness is below the line when it refers to being appropriate for the future needs of society.

Figure 2 Generic Output Funding Model

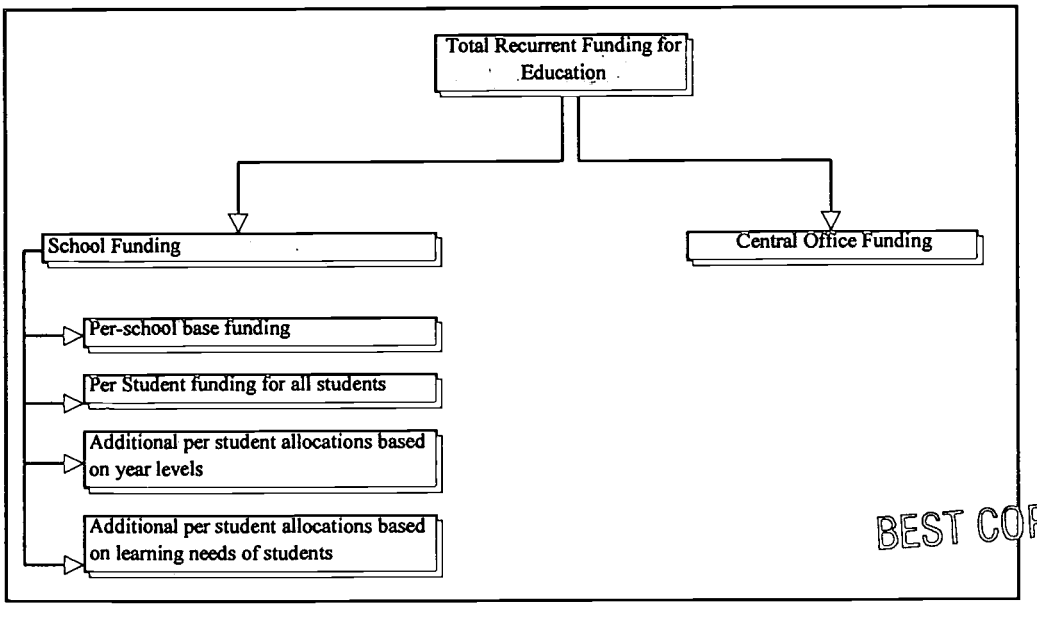


Figure 3 Model of Implicit Funding Policy Analysis

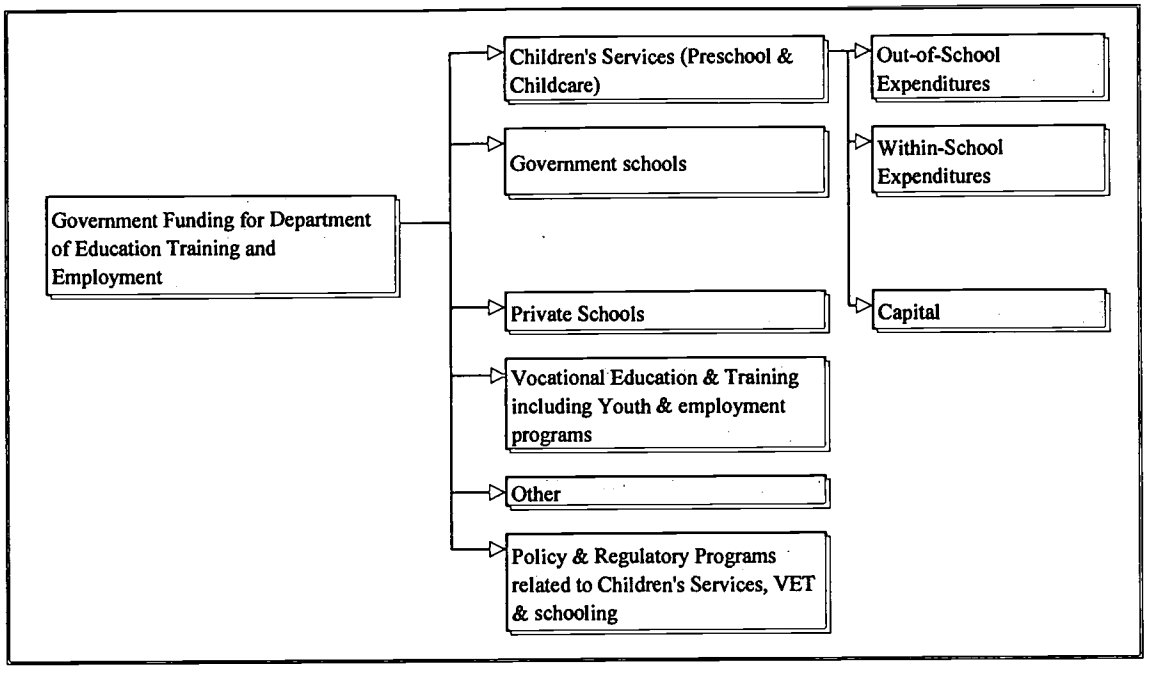


Figure 4: Allocation of Resources to Major Output Classes in 1997/98

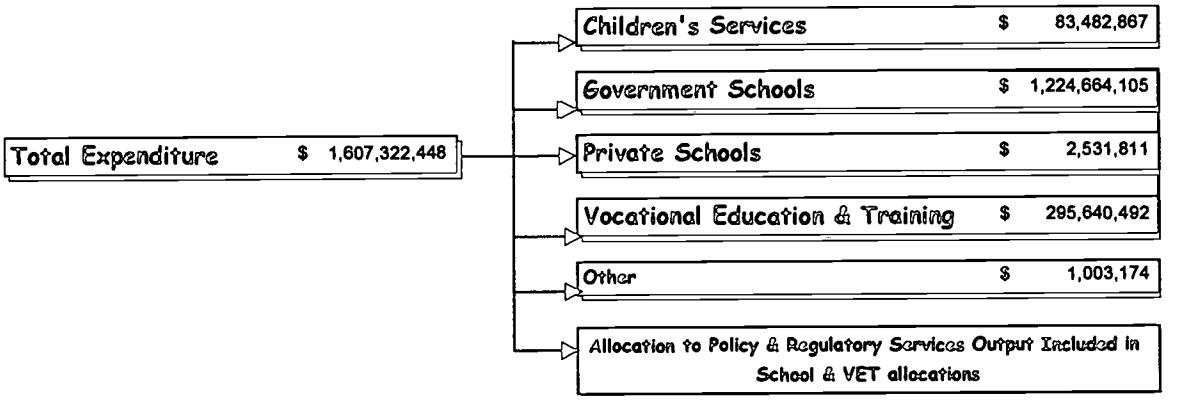


Figure 5: Multiple Regression Analysis of Actual Expenditures

Regression Statistics	
Multiple R	0.980474293
R Square	0.961329839
Adjusted R Square	0.960446671
Standard Error	260412.3853
Observations	628

Figure 6: Multiple Regression Analysis of Actual Expenditures

ANOVA	*Degrees of freedom*	*SS*	*MS*	*F*	*Significance F*
Regression	14	1.03343E+15	7.38163E+13	1088.50114	0
Residual	613	4.15704E+13	67814610399		
Total	627	1.075E+15			

Figure 7: Implicit School Resource Allocation Formula

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	$ 175,488	$23,129	7.59	0.00
Aboriginal	-$12,733	$78,291	- 0.16	0.87
Area & Combined	$ 467,868	$40,546	11.54	0.00
High	$ 183,288	$71,018	2.58	0.01
Junior Primary	-$36,371	$52,758	- 0.69	0.49
Special	$ 278,657	$87,235	3.19	0.00
R-2 Base	$3,089	$ 229	13.48	0.00
3 to 7 Base	$2,645	$ 133	19.92	0.00
8,9 & 10 Base	$3,320	$ 168	19.76	0.00
11 & 12 Base	$7,236	$ 309	23.39	0.00
Special Students in Mainstream Classes	$2,970	$1,578	1.88	0.06
ATSI	$5,229	$ 769	6.80	0.00
Poverty	$1,042	$ 305	3.41	0.00
Special Students in Special Classes etc.	$14,622	$1,521	9.62	0.00
NESB	$ 921	$ 277	3.33	0.00

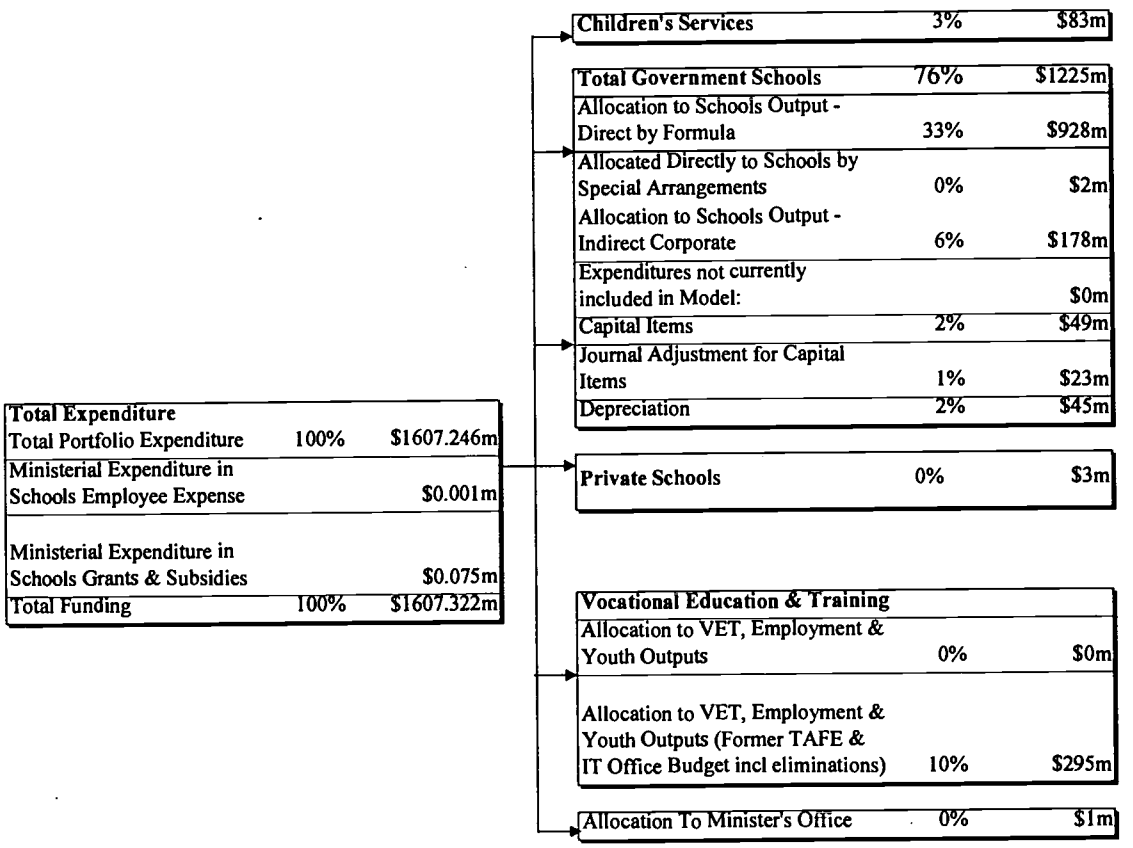
Figure 8: Re-Presentation of Implicit Funding Policy

Per School Funding - All Schools		$139,117
Additional Per School Funding	Primary	$36,371
	Aboriginal	$23,638
	Area & Combined	$504,239
	High	$219,659
	Junior Primary	$ -
	Special	$315,028
Per Student Funding - all Students		$2,645
Additional Per Student Funding	R to 2	$ 444
	3 to 7	$ -
	8,9 & 10	$ 675
	11 & 12	$4,592
	Special Students in Mainstream Classes	$ 326
Additional Equity Funding	Students from Non-English Speaking Backgrounds	$ 921
	Aboriginal Students	$5,229
	School Card Recipients	$1,042
	Special Students in Special Classes	$14,622

Figure 9: Out-of-school Expenditures 1997/98

Service	Total Budget Allocation
Expenditures Relating to Specific Schools - Special Arrangements	$1,583,730
Administration and Finance	$13,671,929
Facilities	$28,515,822
Other Corporate Support Services	$10,674,246
Curriculum Support including Aquatic, Outreach & Instrumental Music Services	$37,445,369
Aboriginal Education	$7,275,808
Special Education and Other Student Support	$25,996,515
Executive Management & Support (Includes Planning & Accountability)	$6,327,276
Human Resource Management Services	$21,824,030
Information Technology Services	$14,790,983
School Operations Central & District Support Services	$11,028,536
Total	$179,134,243

Figure 10: Summary Allocation of Resources to Outputs



The 76% of total resources allocated to reception to year 12 education is further disaggregated in figure 11, where both actual out-of-school expenditures and the implicit expenditures within schools from the regression analysis have been combined.

Figure 10 shows how total resources are allocated to the outputs of Government schooling, Vocational Education and Training and Children's Services (preschool and childcare).

Figure 11: Detailed Dissagregation of all Expenditures Relating to R-12 Education 1997/98

		Budget Allocation	Number of Students	Per Capita	In-School Expenditures
Allocated to ALL Schools on a "per-school" basis	13%	$154,428,206	177,191	$872	$154,428,206
Allocated to ALL students on a base per capita basis	37%	$458,094,412	177,191	$ 2,585	$458,094,412
Allocated to students on the basis of year of study	11%	$136,448,298	177,191	$770	$136,448,298

Allocated to Aboriginal Students					
Spent Corporately on Behalf of Aboriginal Students					
Allocated to Students with Disabilities					
Spent Corporately on Behalf of Students with disabilities					
Allocated to NESB Students					
Allocated to Students who are school card recipients					
Allocated to students of the Open Access College					
Allocated to Students of the SA Secondary School of English					
Allocated to Students of the SA Secondary School of English by special arrangement					
Other Special Allocations to Particular Schools					
Administration and Finance	2%	$27,940,595	5,343	$ 5,229	$27,940,595
Facilities	1%	$7,275,808	5,343	$ 1,362	
Other Corporate Support Services	4%	$50,888,897	9,895	$ 5,143	$50,888,897
Curriculum Support including Aquatic, Outreach & Instrumental Music Services	2%	$25,996,515	9,895	$ 2,627	
Executive Management & Support (Includes Planning & Accountability)	1%	$13,116,677	14,241	$921	$13,116,677
Human Resource Management Services	6%	$70,647,596	67,807	$ 1,042	$70,647,596
Information Technology Services	1%	$7,063,331	829	$ 8,522	$7,063,331
School Operations Central & District Support Services	0%	$1,025,753	141	$ 7,301	$1,025,753
Funding to Schools Which Closed at the end of 1997	0%	$1,073,902	141	$ 7,643	
Not Included in Model	0%	$ 509,828	5,498	$93	
Total Expenditure Allocated to Schools	1%	$13,671,929	177,191	$77	
	2%	$28,515,822	177,191	$161	
	1%	$10,674,246	177,191	$60	
	3%	$37,445,369	177,191	$211	
	1%	$6,327,276	177,191	$36	
	2%	$21,824,030	177,191	$123	
	1%	$14,790,983	177,191	$83	
	1%	$11,028,536	177,191	$62	
	1%	$8,252,703	177,191	$47	$8,252,703
	10%	$117,623,392	Capital Expenditures		
	100%	$1,224,664,105			$927,906,469

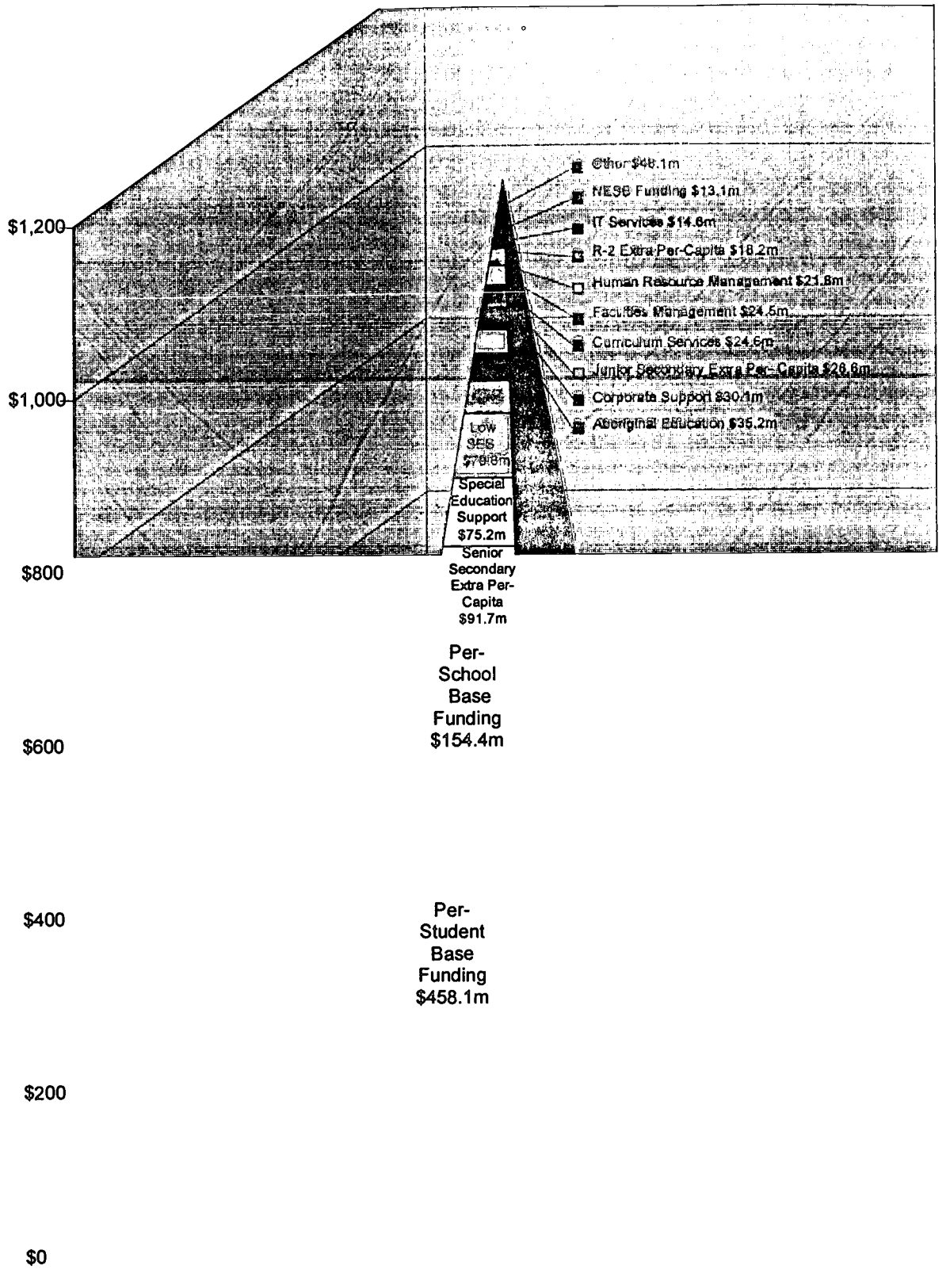


FIGURE 12: 1997/98 School Expenditure Pyramid

Figure 13: Comparison between secondary year level funding relativities

Year Level	Implicit Corporate Resource Allocation	Case- Study Relativities All Schools	Case- Study Relativities Country Schools	Case- Study Relativities Metro Schools
8	100%	100%	100%	100%
9	100%	103%	107%	101%
10	100%	106%	112%	105%
11	218%	119%	140%	111%
12	218%	119%	140%	111%

Figure 14 Conceptual Diagram of Equity funding

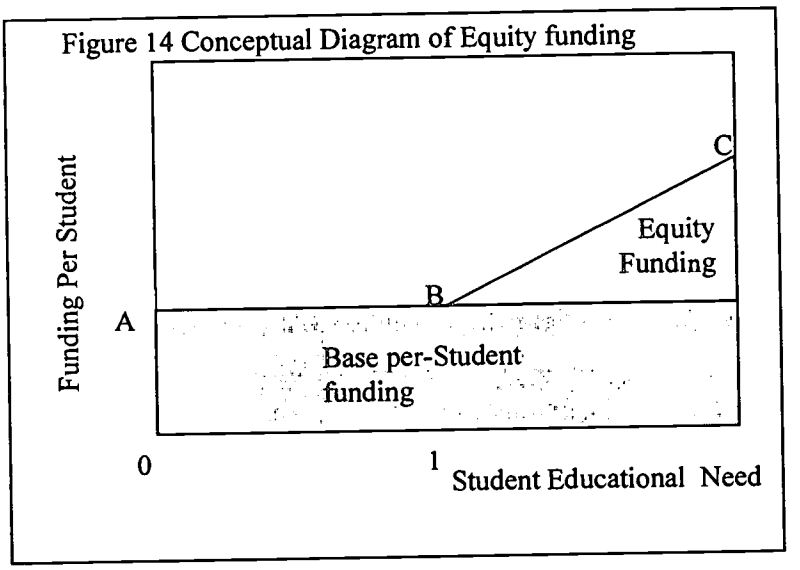
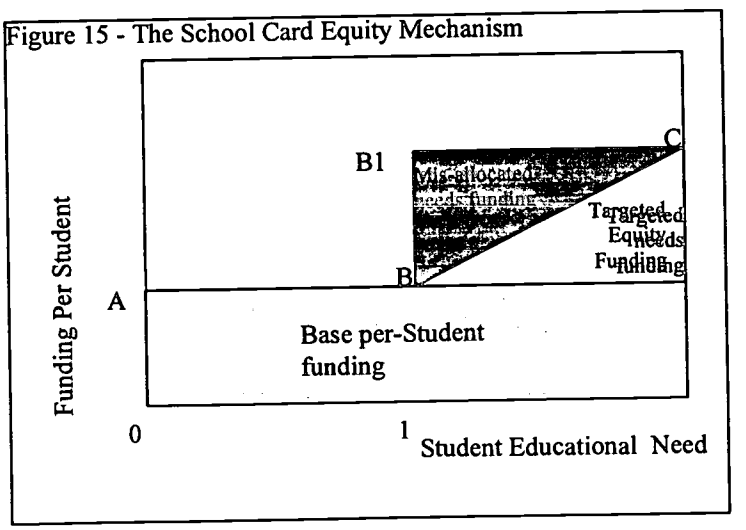
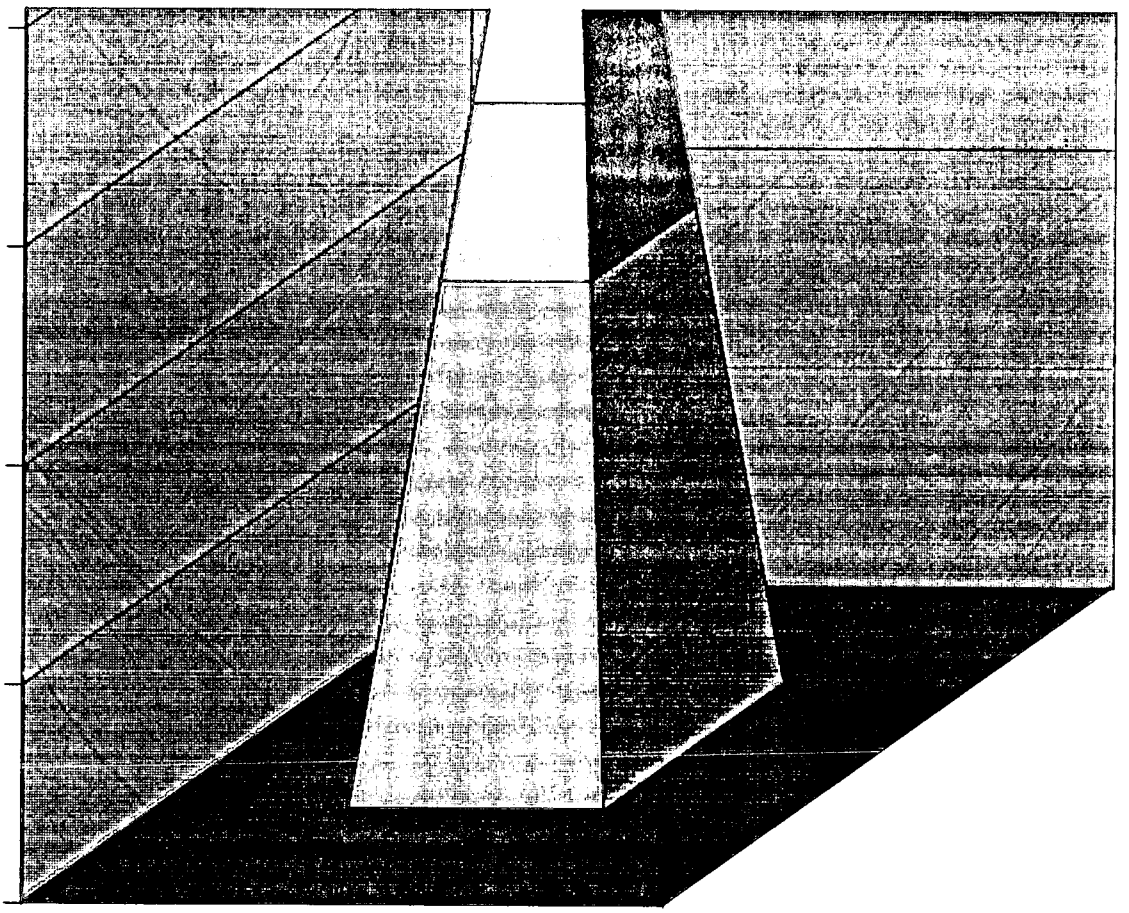


Figure 15 - The School Card Equity Mechanism





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