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ABSTRACT

While considerable attention has been paid to the supposed qualitative outcomes of changes in level of financial support for public school education, comparatively little is known about the effects of funding changes on the provision of educational services. An examination of the levels of government expenditure on education in British Columbia, Alberta, Saskatchewan and Manitoba from 1976 to 1987 reveals a strong relationship between the state of the provincial economy and levels of financial support. During this period funding levels increased and decreased in all the provinces, with British Columbia experiencing the largest and most frequent fluctuations. Indices were developed for this study to measure the changes in levels of educational services provided. These changes were found to be closely associated with funding levels.

Analysis of data obtained from a sample of 20 British Columbia school districts revealed a similar pattern at the district level. In addition, the mix of services was studied, and significant changes were evident in the percentage of teachers employed in instructional as opposed to administrative and support positions. These changes were associated with changes in levels of financial support.

Certain characteristics of school districts were identified as having the potential to explain different responses to funding changes. Regression analysis was used to test the resulting hypotheses, and produced largely inconclusive results.

This study concludes that although the level and mix of educational services provided in western Canada varied as funding levels increased and decreased over the period studied, in the main school systems proved sufficiently resilient to maintain or even to increase the levels of service they ordinarily provided without dramatically altering the mix of instructional and support staff.

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Chapter 1

Introduction

Since the 1960s significant changes have occurred in funding levels for public school education. Increases in funding resulted from four major causes: (a) deliberate policy at all levels of government as more money became available and public perception of the shortcomings of public schooling increased, (b) demands for an expansion of the curriculum to address concerns with the handicapped, minority groups and the social role of schools, (c) increases in teachers' salaries and benefits, and (d) declining enrolment, which meant (at least in the short term) that additional funds were available on a per pupil basis. Contemporaneously, decreases in funding were triggered by one or more of the following: the post-1971 accountability movement, economic recession, fiscal crisis, tax-payer concern over rising costs, government policy reflecting the public perception that increased funding had not in fact 'improved' education, and, finally, long term effects of declining enrolment. These internal and external pressures affected the funding, the organization, and the operation of the provincial and local public school systems.

This rise and fall in the levels of funding, although differing in degree from province to province, could be observed in Western

Canada during the 1970s and 1980s and was most apparent in British Columbia. The British Columbia economy, with its heavy reliance on primary industries, was among the first to feel the effects of recession in the early 1980s, and the consequent government policy of restraining public spending stimulated considerable public concern about levels of education funding. Since the mid-1980s funding levels have increased as the economy has become more buoyant and both provincial and local governments have been willing and able to spend more on education.

When funding cuts occur in public sector organizations there is likely to be an expression of general dismay, usually coupled with dire predictions about the anticipated long-term consequences. Often, little attention is paid to the actual changes except in global terms such as the percentage differences, the actual dollar figures or the number of staff who might be affected by lay-offs. The same statistics can be (and often are) manipulated to present a case for greater or less financial support.

Research and other studies have been undertaken identifying the impact of funding cuts on public school education in general terms such as numbers of teachers, average class size and pupil-teacher ratios. Sometimes these investigations have been carried out to provide supporting evidence for claims of reduced educational

effectiveness (e.g. Jacobson and Kuehn, 1986, and Kilian, 1985) and comparatively little attention has been paid to what happens when funding increases. Though these statistics can provide a general picture of the situation, specific details or meanings are overlooked or confused. Changes in resource levels affect the organization of school systems in more subtle ways than can be understood by the examination of raw data on the number of teachers or dollars per student. For instance, it is unclear how allocations for personnel change when funding levels vary.

The proportion of classroom teachers to district administrators, school administrators and support personnel may remain the same, or it may change when funding fluctuates. What previous research has been undertaken in this area suggests that proportions do change, but again whether such changes are temporary or permanent and planned or unplanned is unclear. Class size does tend to vary with funding levels, but, given the method of calculating pupil-teacher ratios, the relative importance attached to the maintenance of non-teaching positions is going to affect the number of students in an average class. It is necessary to have a clearer understanding of what actually happens to school system organization when funding levels change if political, administrative, and educational decisions are to be fully informed.

A preliminary review of public school funding policies within the four western Canadian provinces indicated that each of these provinces experienced upward and downward changes in economic conditions, but at different times. British Columbia, with its reliance on primary industries and the American marketplace, was the first western province to experience the adverse effects of a recession that was international in scope in 1982. Alberta did not experience these problems until a few years later, as the petroleum-based economy continued to be strong until the collapse of international oil prices. Saskatchewan is still struggling to climb out of a recession, and the pattern in Manitoba is different again. These fluctuations in the economic fortunes of the four provinces had differing degrees of impact on the funding of education, with British Columbia showing the most dramatic changes (Statistics Canada, 1976-1987: see Appendix A for details).

Purpose

The primary purpose of this inquiry was to examine the effect which fluctuations in funding from 1976 to 1987 had on the educational services provided by public school systems in the Provinces of British Columbia, Alberta, Saskatchewan and Manitoba. A secondary purpose was to analyze the nature and scope of the changes which occurred in the British Columbia's public school system. A final purpose was to consider recommendations for improving some

aspects of educational policy-making, procedures and practices based on the analysis of changes in provincial school systems resulting from funding changes.

Significance

Administration. 'The major problems in education finance experienced by Canadian provinces are related 'o limitations on financial resources available for education and other public services' (Council of Ministers of Education, Canada, 1985:8), and, thus, there is a need for unbiased clarification of what exactly are the organizational consequences of fluctuations in funding levels.

Evidence suggests that Alberta is beginning to find itself in a similar situation to that experienced by British Columbia eight years ago as shown by the recent debate in Alberta over the possible removal of the school boards' rights to tax non-residential property. Specific knowledge of school districts' responses to fluctuations in funding in British Columbia could be of great value to administrators in other provinces.

At the national level there is increased pressure on the Federal Government to provide assistance to the Provinces for the financing of education where the demand for services has been created by a federal policy. There is a public perception that the Federal Government has

a responsibility to assist in funding English as a Second Language (ESL), special programs for immigrant families, French programs, re-training initiatives, and public health projects, while at the same time there is great pressure to decrease the Federal deficit. Further, the impact of future court rulings on matters arising from the *Charter of Rights and Freedoms* as it affects educational issues such as language rights, minorities, multiculturalism and mainstreaming is a matter of conjecture. It is certain, however, that there will be an increasing need for detailed information on the consequences of funding changes or reallocations.

Research. The need for further information in this area has been identified by other researchers. Choy notes that 'further research on domain changes in response to budget cuts and research on the impact of domain changes on the quality of education is needed' (1979:202). She reinforces this point in her later study: 'The analysis presented here suggests that organizational characteristics are important intervening variables in the relationships between resources and outputs. Research ... is therefore needed to provide the information needed to cope with decline' (Choy, 1980:50). Anderson and Mark (1983) claim that 'educators need to document the benefits being derived from increased levels of administrative support services in order to prevent their loss as further budget restraints are introduced' (p.9).

The preceding comments demonstrate the importance of a clearer understanding of what Choy calls the 'intervening variables'. If researchers are to encounter greater success in their attempts to find relationships between educational inputs and outcomes, a task which has so far produced results which are at best ambiguous (Averech, Carroll, Donaldson, Kiesling and Pincus, 1974; Hanushek, 1981, 1986) they need a stepping stone which gets them at least part of the way across the stream. This research is intended among other things to help provide that stepping stone, by presenting specific information about the impact of funding changes on the proportional allocation of staff to instructional, adminstrative and support positions. It is suggested that this allocation of staff, reflecting as it does the priorities of decision makers, may well be a more important factor in determining educational outcomes than more common primary input measures such as the level of funding or the number of teachers.

Assumptions, limitations and delimitations

Assumptions

1. The econometric techniques employed are appropriate for the analysis conducted.

2. The value of any commodity or service is reflected in market prices.

3. The indices developed are valid instruments for comparison.

4. The data published by Statistics Canada and the British

Columbia Ministry of Education are as accurate and reliable as any obtainable, and as consistently defined.

5. Where data reporting techniques have changed over time, the resulting differences are not so great as to seriously impair comparability.

Limitations

1. In British Columbia the methods of reporting data changed with the introduction of the Fiscal Framework in 1982. Data from earlier years have been adjusted to correspond as closely as possible to the figures reported after that date.

2. Where it was felt that the recalculation of data from other sources would not be sufficiently comparable (as with the figures for special education in the 1970s), data for those years have been omitted.

3. In 1985, the British Columbia Ministry of Education adjusted the school financial year from the calendar year (January to December) to the academic year (July to June). The six-month transition period (January 1 to June 30 1985) has been ignored as a separate budget unit.

4. Data reported by Statistics Canada sometimes differ from those reported by the British Columbia Ministry of Education. In no case have conclusions been drawn based on a comparison of data from both Federal and Provincial sources.

Delimitations

1. This study covers the period 1976 to 1987.

2. The macro-analysis is limited to the four western Canadian provinces: British Columbia, Alberta, Saskatchewan and Manitoba.

3. The micro-analysis is limited to a stratified random sample of 20 British Columbia school districts.

Definition of terms

In the course of the study, essential definitions will be given in detail, but the following working definitions reflect the scope of the study by explaining key concepts.

Enrolment. Full-time equivalent (FTE) students enrolled in public schools on September 30.

Teacher. A person holding a teaching certificate and employed by a public school district.

Instructional personnel. Certified teachers engaged in classroom instruction, measured by FTE.

Administrative and support personnel. Certified teachers employed by a school district but not engaged in classroom instruction, measured by FTE.

Current dollars. Funding or expenditure expressed in current values.

Constant or real dollars. Funding or expenditure adjusted for inflation using the Canadian Consumer Price Index (CPI) as reported

by Statistics Canada.

Pupil-Teacher Ratio (PTR). The ratio of FTE students to FTE teachers.

Gross Domestic Product (GDP). Provincial Gross Domestic Product *per capita*, indexed from 1976 as a base year.

Staffing Units (SU). In the macro-analysis, *gross* provincial government expenditure on public school education divided by average teacher salary. In the micro-analysis, funds allotted for public school *instruction* divided by average teacher salary. (The latter is a better indicator, but the data available are not consistent enough to allow inter-provincial comparisons because of differences in definition.)

Staffing Units Per Pupil (SUPP). SU divided by FTE enrolment.

Service Mix Index (SMI). The proportion of Instructional Personnel to Administrative and Support Personnel, measured by instructional positions as a percentage of total positions (%IP).

Organizational Domain. The services provided, the population served, and the technology used by any organization.

School district wealth. Available local taxation base per pupil.

Chapter 2

Literature Review

This chapter examines the importance of considering the overall economic picture in respect to education funding. It also reviews some theoretical aspects of organizations, including growth, organizational domain and responses to environmental change, with particular reference to education, examines some recent research on the specific reaction of school systems to variations in resource levels and finally looks at some current trends in the journal literature pertaining to education finance.

Economic Conditions and Educational Change

Economic conditions provide the framework within which governments are compelled to operate when allocating funds. Schick (1988) has pointed out that during periods of economic growth governments can alter priorities 'without shifting resources from one budget area by allowing programs to develop at different rates' (p.527). In times of fiscal stress, however, a different picture emerges. In his analyses of macro- and micro-budgetary adaptations to fiscal stress Schick (1986, 1988) describes macro budgeting as 'the process of constraining total expenditure' (1988, :523), and micro budgeting as 'the process of applying spending limits to particular programs and decisions' (1988:523). He draws a distinction between 'claimants'

seeking more funds as they engage in micro budgeting, and 'conservers' whose role is to limit spending through macro budgeting, and notes that in decline 'priorities cannot be rearranged through indirect means' (1988:527). Although these descriptions are not specifically intended to apply to expenditure on education, they are clearly pertinent to this study.

Ward (1988) claims that 'education policy and school finance are dependent variables affected by events, forces and trends in the larger social, political and economic environment' (p.181). Ratsoy and Richards (1980) have noted that 'since education requires resources, affects earnings and is financed out of income, it is understandable that decisions affecting the financial support of education must be considered in respect of the entire economic system' (p. 28). Measures of national (and regional) wealth and economic growth should be 'of central importance to educators and others who make decisions concerning allocation of funds to education' (p. 17).

If we accept a basic assumption about the economic system that the value of any commodity or service is reflected in market prices, the next step in any analysis is to select an appropriate unit of measurement which has 'a degree of generality to enable cross -sectional and longitudinal comparisons to be made' (Ratsoy & Richards, 1980:15). A conventional measure of the value of goods and

services produced (and hence income created) in any period is the Gross Domestic Product (GDP). To standardize for population trends this may be expressed as GDP *per capita* (Department of Finance, Canada, 1988).

It is also important to take inflation into account by deflating current dollars to 'real' or 'constant' dollars to permit comparability over time and to show differences between apparent and actual figures (Ratsoy & Richards, 1980:15). For instance, Krueger (1988) has pointed out that the 2% increase in education funding announced recently by the Alberta government is actually a net decrease in real dollars (p. 21).

The school system, like any organization, does not exist in a vacuum but within an encompassing environment (Hodgkinson, 1978) which affects its operation (Campbell, Fleming, Newell and Bennion, 1987; Getzels, Guba and Thelen, 1960; Thomas, 1971). Changes in the environment, economic or otherwise, stimulate either a static or dynamic reaction. A static reaction attempts to maintain the *status quo*, while a dynamic reaction involves 'a rearrangement of the internal sub-systems of the organization or ... a change in its goals in order to adjust to changing circumstances in its external environment' (Owens, 1987:73). These reactions may also be described as 'no change' or 'change' in the way educational services are provided (Choy,

1979).

Organizational Growth

Organizations pursue the twin metavalues of maintenance and growth (Hodgkinson, 1978); these 'conservation' values act as incentives for individual participation (Simon, 1976), even though they may ultimately be counter-productive in terms of efficiency and effectiveness (Barnard, 1979). It has also been claimed (Weber, 1946) that as organizations increase in size there is a tendency for the administrative component to increase more rapidly than the line component, although this view has been challenged (Blau, 1972). In an educational environment, however, there is some evidence to suggest that Weber's claim is correct, even though overall costs increase because of the higher salaries paid to administrators (Lesser, 1979).

Most of the early literature dealing with organizational change looked on growth as a natural and desirable state of affairs. Decline, retrenchement and restraint were to be eschewed as signs of failure. Only comparatively recently have economic and demographic constraints forced educational administrators to look seriously at these phenomena (Glassberg, 1978; Levine, 1978).

Organizational Change

Organizational Domain

Levine and White (1961) introduced the concept of organizational domain with reference to health agencies, and Thompson (1967) pointed out its usefulness in analyzing all types of complex organizations (Choy, 1979). By organizational domain is meant the services provided, the population served and the technology used. School systems are limited in the changes they can make: the basic technology of instruction (one teacher to a classroom) is to all intents and purposes fixed, and public schools have virtually no control over the size of the population they serve. 'Domain changes therefore have to be limited to changes in the services provided (the level, the mix, or both) and in certain aspects of how they are provided' (Choy, 1979:22).

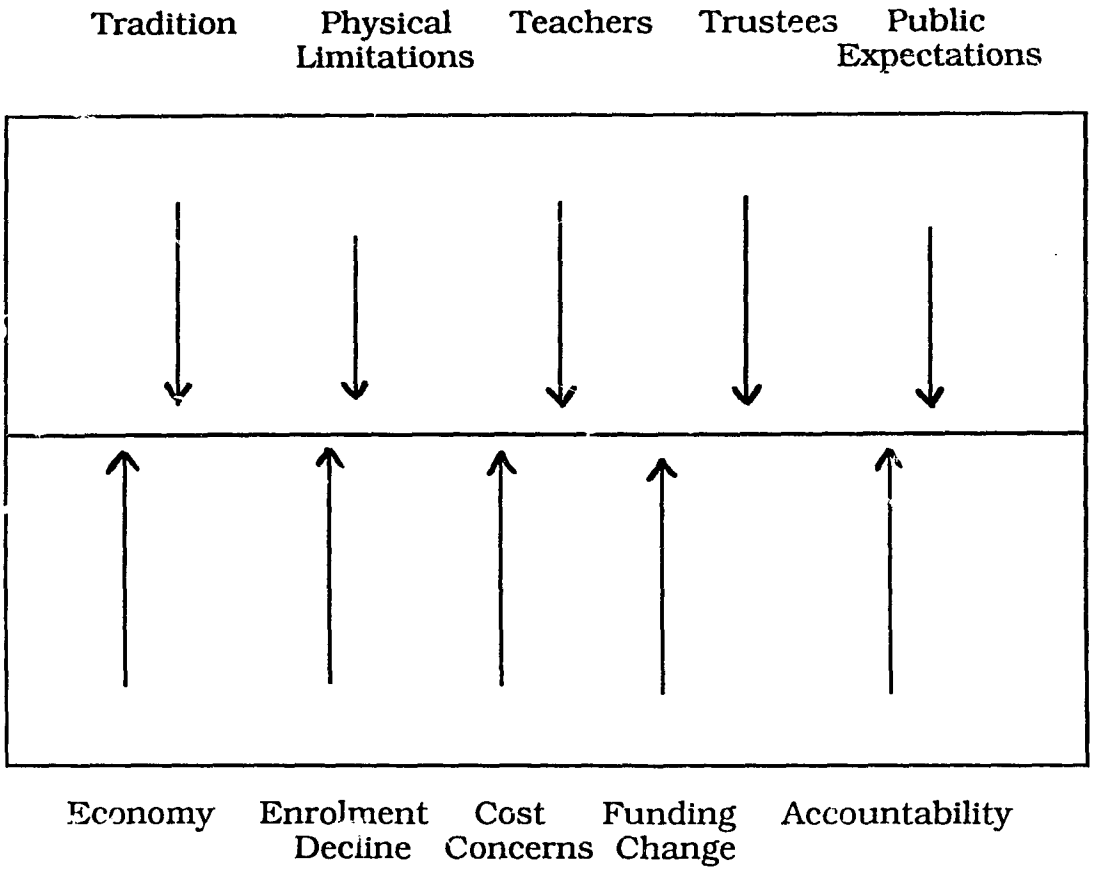
Field Theory

Kurt Lewin's early work on the dynamic theory of personality and child behaviour (1935) developed the concepts of forces acting on an individual, and led to an extension of this idea to group behaviour (Lewin and Grabbe, 1945) and to social change (Lewin, 1947a, 1947b, 1951, 1953). Its usefulness in the analysis of social systems has been noted by writers on educational change (e.g. Benne, 1985; Bennis, Benne and Chin, 1985; Berg and Ostergren, 1977; Ingram and McIntosh 1976; Jenkins, 1962; Owens, 1987).

Lewin (1935) stressed the importance of the consideration of the total situation, and explained that forces are defined by three properties: direction, strength and point of application. He originally saw the opposition of approximately equally strong field forces as productive of conflict, but this idea has been developed to include the physical concept of any body being held in position by counterbalancing sets of forces (Ingram & McIntosh, 1976). This in turn leads to the suggestion that for any change to take place the system must be 'unfrozen' so that relationships may be reordered in a different way and then refrozen (Lewin, 1951, 1953; Owens, 1987).

The forces acting to change the system include the state of the provincial economy, factors connected with enrolment decline, concerns over rising costs, actual changes in funding levels and an increased emphasis on accountability. Acting against these in an effort to maintain the system are the forces of traditional growth and established practices, the physical limitations of schools and classrooms, pressures from teachers acting either out of professional concerns or those related to job security, and public expectations and

FORCES TO MAINTAIN SYSTEM



FORCES TO CHANGE SYSTEM

Figure 1: Forces acting on a school system.

demands, often reflected in the actions of school trustees. There are, of course, other forces at work, but these seem most relevant to the present investigation. It is also worth noting that Lewin suggested that the most desirable way to introduce change is by reducing or removing forces. The next most desirable is to change the direction of the forces. The least desirable method is to strengthen or add forces, as this increases pressure and tension (Ingram and McIntosh, 1976). Unfortunately, most of the forces for change identified above fall into the last category.

Response to Environmental Change

Organizations, educational or otherwise, have to be responsive to environmental change, particularly if this change is specifically financial. Choy (1979, 1980) concludes from her review of the literature that organizations have two options, 'no change' or 'change', for both of which a case can be made. No change entails an across-the -board response, such as a percentage cut in funding to all departments. An example of this was the British Columbia government's formula-based budget cuts in 1982, when all school districts were faced with a fixed percentage cut in their proposed budgets, regardless of how thrifty or extravagant their claims were (Fleming and Anderson, 1984). No change may be selected for various reasons, such as the cost of the search for new alternatives, limited capabilities of decision-makers or, as was the case in the example

cited, lack of specific and relevant information. In addition the high cost of changes in terms of sunk costs, and individual resistance to change may help to maintain the *status quo* (Choy, 1979). All things being equal, no change will be chosen over change (March and Simon, 1958).

On the other hand, a case can be made for change: budget cuts may act as a stimulus to administrators to re-examine priorities, particularly with respect to ancillary services; legal constraints may make domain changes essential to retain mandated services; and changes in organization size may require structural change (Choy, 1979). To return to Lewin's (1945) terminology, it will depend on the attributes of the constellation of forces.

Much of the earlier literature on change in educational and other social organizations tended to focus on planned change (e.g. Bennis, 1966; Bennis, Benne and Chin, 1969; Carlson, 1965; Havelock, 1973; Miles, 1964). It is also interesting to note the publication dates, which reflect the concern of educators with growth during a period of climbing enrolment, educational innovation and public willingness to spend more on schools. However, more recent research and writing have concentrated on organizational responses to falling enrolment, crises, decline, retrenchment and restraint - terms which were almost unheard of in the euphoria of growth and expansion.

Reaction to Crisis and Threatening Change

Fink, Bean and Taddeo (1971) attempted to expand the characteristics of an individual's reaction to crisis to the organizational level by identifying four stages: (1) shock, when the threat is perceived; (2) defensive retreat, when maintenance of the system to guarantee survival is paramount; (3) acknowledgement, when problems are examined rationally and solutions sought; and (4) adaptation and change. Although the model has been challenged because of its theoretical base (Solomon and Paris, 1971), it does display similarities to Lewin's (1951, 1953) concepts of change as a three-stage process of unfreezing, change, and refreezing. Aspects of this theory are also supported by Cibulka (1987), whose study of ten urban school systems in the United States showed that denial was the first response pattern to enrolment declines in every school system. 'Its distinguishing hallmark was to assume that there was no problem' (p.16), and this denial persisted until revenue shortages began to occur. Even then school officials 'behaved as though it were an unimportant, even temporary development, which demanded no planned, sustained and dramatic response' (p. 17). It would seem that in times of crisis, decision-making ability is impaired (Holsti, 1971).

Much research on change in the organizational domain of schools has concentrated on the outcomes of such change as defined by some measure of student achievement. (See especially major

reviews by Averech, Carroll, Donaldson, Kiesling and Pincus (1974) Hanushek (1981, 1986), and Glass, Cahan, Smith and Filby (1982).) Two particular factors, declining enrolment and fiscal restraint, encouraged writers and researchers to try to document the negative impact of reduced funding (for British Columbia examples see Tagg (1983), Kilian (1985), Coleman (1986) and Jacobson and Kuehn (1986)). This is a remarkably difficult task (Hanushek, 1986; Skolnik, 1986, 1987), but represents the bulk of recent Canadian writing on the impact of budgetary restraint on various aspects of the school system (e.g. Eeles and Stevens, 1982; Fleming, 1985; Jefferson, 1987; Richards, 1980; Steer, 1982; Tagg, 1983) and post -secondary education (e.g. Decore and Pannu, 1986; Dennison, 1985, 1987).

The issue of declining enrolment, which in Canada was much addressed prior to the economic recession of the early 1980's (e.g. Canadian Teachers' Federation, 1978; Husby and Riffell, 1979; Kerwin, 1978; Rideout and others, 1977; Schwartz and McGowan, 1977) had, paradoxically, more to do with growth than organizational decline. Unless funding is tied very specifically to enrolment, fewer students mean lower pupil-teacher ratios, with more staff resources available either to reduce class size or to increase administrative and support positions (Anderson and Mark, 1983). Ultimately, however, declining enrolment is likely to lead to budget cuts and downsizing (Cibulka,

1987; Garms, Guthrie and Pierce, 1987; Guthrie, 1980; Lawton, 1987).

This decline could also be viewed positively. Cuban (1979) challenged researchers to break out of the intellectual straight-jacket in which they saw shrinking enrolment and school closures as totally negative. This attitude, he claimed, was not simply making a virtue out of necessity (as researchers had generally preferred growth to decline), but a realization that this approach might hinder research on enrolment decline, and thus prevent the development of practical suggestions for educational policy makers. Behn (1983) looked on enrolment decline as a 'managerial opportunity', with lay-offs emphasizing the need for teacher assessment to establish criteria. If education is to provide education for students rather than employment for teachers, then evaluation provides a more equitable criterion than seniority when lay-offs must take place. Behn also suggested that retrenchment needs more centralized decision-making, and that is why administrative costs rise in a period of enrolment decline. There appears to be little (if any) empirical evidence to support this.

Research Specific to Domain Changes and Funding

There have been several recent studies which address this question, of which four will be examined here. They deal with both Canada and the United States, and document the results of funding

cuts brought about by taxpayer revolt, government policy, economic recession, or fiscal crisis.

Funding Changes in California

Catterall and Brizendine (1985) examined the impact of California's Proposition 13 (which sharply reduced local tax revenue for public school education) on high school curricula. They found a 25% reduction in real resources available to school districts from 1978 to 1983. This resulted in reduction of teaching and other staff, restriction of salary growth, and trimming of budgets for materials and support services. There was an increasing emphasis on basic skills, and a corresponding reduction in the availability of elective courses. Summer school programs were eliminated, and all districts reported reductions in numbers of counsellors and school psychologists. Their findings demonstrated a remarkable uniformity of response in the eight districts studied.

Funding Changes in Missouri

Anderson and Mark (1983) looked at schools in St. Louis, Missouri, over a seven-year period, and found support for their hypothesis that declining enrolments are associated with increased resources allocated to administration and administrative support positions. They also found that reductions in budgets caused re -allocations to commence, starting with lay-offs of teachers and

moving to reductions in administrative and support staff. They suggest that this is because the amounts spent on administration may seem excessive in times of financial retrenchment, especially because there are no documented benefits from increased support personnel (p. 17). They categorize changes in enrolment per teacher, per support staff, per administrator and per certificated staff, and claim that their findings are supported by figures from British Columbia from 1975 to 1982.

Funding Changes in British Columbia

Tagg (1983), in an unpublished Ph.D. dissertation, examined the effect of government-imposed fiscal restraint on a rural British Columbia school system by detailing changes which occurred in Windermere. He claims that his findings were in many ways typical of other districts in B.C. He notes that the initial reaction to budget cuts was denial or the feeling that the problem was only temporary, thus helping to confirm theories of Fink, Bean and Taddeo (1971) and Cibulka (1987) (see above). His findings indicate that initially instructional positions and salaries were protected, with cuts evident in other areas such as office, supplies, maintenance, school patrols and clerical time available. Buses were converted from gasoline to propane, and janitorial efficiency improved. Measures of this sort could and did result in considerable cost-saving in many districts; see, for example, Canadian Education Association (1986) and School

District No. 62 (Sooke) (1986). Part-time teacher-librarians were laid off, but strong opposition from the local teachers' association helped protect instructors from lay-offs and salary cuts. The board 'streamlined its operations without directly affecting students' (p.27). Tagg's study does provide some useful information but is limited by the short period of time it covers, and (more seriously) by the author's use of emotive language and political commentary, which detracts from the academic credibility of the paper.

Funding Changes in New York

The most detailed and rigorous research is found in Choy's studies of the New York school system (1979, 1980a, 1980b). The 1975 fiscal crisis in New York City had a direct and immediate impact on the resources available to the public schools, and precipitated the lay-off of 16,000 teachers. Choy, in her first paper, examined organizational domain changes in 94 public high schools resulting from two substantial budget cuts in 1975-76 and 1976-77. The first budget cut led to a change in the mix of services: instruction and administration and support were both cut, but proportionately greater cuts were made in administration and support. The second budget cut led to further reductions in both, but no further significant change in the mix of services was observed. The net effect was to bring about proportionately greater cuts in administration and support than in instruction.

Class structure was also changed: average class size was increased, and the number of subjects taken by students decreased. Following both cuts relatively more emphasis was placed on increasing class size than on decreasing the number of subjects taken, but considerable variation was observed between schools. Choy used regression analysis to examine the cause of the variation, and found that the change in the mix of services was significantly related to the pre-cut mix of services and the type of school (academic or vocational) following the first cut. Following the second cut, the change in mix of services was significantly related to the same two variables, plus the stability of the school population and school size (Choy, 1979:3-4).

Following up on this research, Choy extended her study (1980a, 1980b) to include data concerned with modest increases in funding in 1977-78 and 1978-79. She found that both instructional and administrative support services were increased, but that the proportion of resources devoted to each did not change from the post -cut position. The average number of subjects taken per student per day increased to almost the pre-cut level, and while modest decreases in average class size were observed, the average size remained closer to the post-cut than pre-cut level. Again, considerable variation was observed between schools in their responses to changing resource levels (Choy, 1980b:3).

Recent Trends in Education Finance

It appears that the tendency of organizations, their administrators, and researchers into matters pertaining to them is indeed to see growth as essential. The enrolment decline and economic problems of the 1970s and 1980s are behind us, and the organizational lessons to be learned from restraint and retrenchment, with a few exceptions, seem to have been put on the shelf in the pious hope that they will not be needed again. Brown (1987) saw evidence of this in his study of the issues and priorities which superintendents considered most important. There appeared to be no substantial differences between the responses given in good times or more difficult periods. In an earlier (1985) article, however, he does suggest that lessons ought to be learned, and that alternative funding practices (such as school based management) might profitably be explored. As this section demonstrates, writers and researchers have returned to familiar themes and explored a few new aspects of these themes.

A unique feature of the American public school system is the tremendous disparity in per-pupil spending between different jurisdictions. Hartman (1988) used this disparity to help illuminate a topic of interest in the context of this study: the differences in spending patterns between rich and poor school districts. He suggests that the perception of a cost/quality relationship (even

though empirical evidence for the relationship is at best ambiguous) follows this pattern: educational expenditures - educational resources - educational programs - student outcomes (p.438). Cost per student is the most common measure of equity, and some school finance systems have been declared unconstitutional on this basis. His study of 501 school districts in Pennsylvania was designed 'to investigate the first link in the cost-quality chain' (p.440), that between expenditure and resources. He categorized districts as high, middle or low spenders, and used Weighted Average Daily Membership (WADM) to represent student numbers. Resources he defined as teachers, administrators and coordinate services staff. His findings, not unexpectedly, showed that higher spending districts put more money into personnel: there were more teachers, administrators and coordinate services staff per student, and more administrators and coordinate services staff per teacher.

Higher spending districts provided more of their own funds through local taxation than lower spending districts, and although they spent proportionately less on instruction (58.1% compared with 61.3% in lower spending districts), they were spending far more in dollar terms ($3,657 compared to $1,388). It should again be noted that inter-district disparities of this magnitude simply do not occur in the Canadian provinces, and thus although Hartman's research addresses one of the questions asked in this study, his findings should

not be viewed as being generalizable to western Canada.

In addition, the use of WADM as a unit of measurement has been challenged by Sederberg and Hendrix (1988). In their assessment of the use of WADM in Minnesota they found that

> programmatic and functional district expenditures per weighted pupil unit do not provide a reliable matching of resource inputs with units of service and therefore should not be used to compare districts, trend analysis or policy research without appropriate adjustment (1988:248).

The search for a cost/quality relationship continues as Childs and Shakeshaft note in their 1986 meta-analysis of research into this question. They found that, based on the research studied, overall educational expenditures had little effect on student achievement. This, they suggest, is perhaps due to the methodology of the studies, and point out that their meta-analysis does 'suggest a positive relationship between money used for instructional purposes and increased student achievement' (1988:263). They mention a point germane to this study by stressing the need to look at the indirect effect of expenditures on student achievement.

A further example of the continuing interest in research in this area is given by the U.S. Department of Education, whose 1988 study claims that class size is an unimportant factor in predicting student

achievement until the student-teacher ratio declines to 5:1. They also point out the depressing fact that to reduce the ratio to even 15:1 would cost over $69 billion annually, a projection which may, in itself, lay the class-size debate to rest for a while.

Echoes of Coleman's (1966) report can be heard in the continuing complaints about the difficulty of isolating resource allocation practices from the highly correlated factors of wealth, socio -economic status and racial composition (MacPhail-Wilcox and King, 1986). Lee, Aron, and Aron (1988) found in their study of Michigan Educational Assessment Program (MEAP) scores that basic instructional expenditures were highly correlated with MEAP scores, and that these scores were higher (and drop-out rates lower) where the proportion of local revenue was the greatest. This ties in with Hartman's 1988 findings on spending patterns (see above), and appears to reinforce the usefulness of socio-economic status as a predictor of academic success.

Agenda for Education Finance Research

Odden (1986a) offered 'a school finance research agenda for an era of education reform', and suggested that the 'new concern is how to finance education to improve its quality' (p.49). He identified new agenda items as follows: school finance and education reform, local use of reform dollars, cost impacts of reform programs, and cost

effectiveness of alternative strategies for reform objectives. The traditional problems would still provide plenty of grist for the researchers' mill: national trends, equity of resource distribution, funding for special needs children, tax equity, and alternative revenue sources to schools. To these topics he added pre-school and day care issues, public-sector choice programs and computers in school finance.

School Finance and Education Reform

It begins to be possible to see how close Odden came to accuracy in his agenda. There is certainly much analysis of the two decades of reform: the 1970s characterized by issues of equity and equality as state finance systems struggled with school finance reform, and the 1980s dominated by education reform centred on excellence and quality (Ward and Camp, 1988). They suggest (as Ward (1988) does elsewhere) that support for school finance reform and social action declined in the late 1970s as they had not 'materially improved the plight of those they were designed to aid' (Ward, 1988:193). The swing to issues of adequacy rather than equity may represent a backlash.

Some saw positive financial consequences of education reform. Wright and Inman (1988) claim that reform showed that 'most institutions have fat that can be trimmed' (p.11), and that education

reforms can save rather than cost money. In their study of Dallas Independent School District they found that in 1978 the district had the highest per pupil cost in Texas, and one of the lowest ratings on standardized tests. By cutting 25% of the staff over two years, raising the remaining teachers' salaries, slashing the number of student elective courses from 350 to 120, and tightening the attendance policy the district produced an academic improvement over 10 years 'unmatched by any other major school district in the country' (p.11).

Some writers looked at specific issues connected with education reform, especially sources of funding and the fiscal impact of reform (Inman, 1987; Odden, 1986b); others were highly critical. Jordan and McKeown subtitled their 1988 article on state funding for reform 'False hopes and unfulfilled dreams'. Kerchner and Boyd (1988) talk of the 'market and bureaucratic failure in educational reform' (p.57), and claim that 'there is a real danger that support for American public education could be jeopardized if the current reform movement ultimately is judged a failure' (p.57).

Equity and Efficiency

Equity issues are still a concern in both Canada and the United States in spite of the shift in emphasis to quality. Coleman (1987) addressed the question of fiscal equity and the problem of student dispersion in British Columbia. Drawing on his previous reaearch

(Coleman and Larocque, 1984), he claims that the Fiscal Framework in British Columbia does not recognize dispersion and treats school districts 'punitively for cost factors beyond their control' (Coleman, 1987:50). Paquette (1987) criticized the lack of vertical equity in Ontario education finance, and Verstegen and Salmon (1988) were unable to arrive at a definite answer to their question of whether equity and excellence had been achieved by finance reform in Virginia.

Organizational efficiency may be counterproductive from a strictly educational point of view, as Callahan (1962) argued, but it becomes a major factor in times of financial restraint. Gronn (1982) noted the reappearance of what he termed neo-Taylorism in the early 1980s, and echoed the concerns of Callahan. An 'efficient' approach in the short term may however also lead to inefficiencies over a longer period. The concerns with declining standards of school facilities because of age and lack of capital improvements during a period of recession identified by the 1988 Royal Commission on Education in British Columbia were also seen as equity issues. Thompson and Camp (1988) found many problems apparent in their study of equity in capital outlay and funding mechanisms in Kansas, and Honeyman, Wood, Thompson and Stewart (1988) concluded that rural and small schools suffered because there were not enough funds available to support modernization, upgrading, safety concerns and provision for handicapped students.

The questions of economic efficiency and accountability addressed in the study by Wright and Inman (1988) described above were also examined with regard to expenditures (Walberg and Fowler, 1987) and management of public school debt (Bland and Yu, 1988). Perhaps signficantly, the legal aspects of school finance policy begin to loom large. In this context issues of equity play a major role (Connelly and McGee, 1987), but it seems likely that accountability and efficiency are also involved.

Implications for Theory

In the recent literature reviewed only one writer (Chabotar, 1987) directly drew lessons from the period of retrenchment, stressing the need for financial forecasting and multi-year plans. Crampton (1988) looked ahead to state/local funding questions in a study of the implications of the 'crisis in Oregon school finance' (p.259), but arrived at no definite answers. On the Canadian scene policy making with regard to education finance was addressed at the provincial level by Bohac's (1989) paper on Alberta's management and finance plan, incorporating Hodgkinson's (1978) value paradigm to explain a shift from a IIA consequence-type organization to a IIB consensus-type one. Bosetti, Landry and Miklos (1989) discount the rational model of educational planning and policy analysis and encourage the use of critical theory.

Summary

The literature and research reviewed indicate that organizational change has until comparatively recently most often been considered in conditions of growth and innovation. When faced with crises or declining resource availability the organizational reaction initially tends to involve denial or temporizing. The research on organizational domain changes in response to funding changes gives some support to this by suggesting that cuts take place initially in areas outside the core technology of the school system. More drastic and long-lasting funding cuts result in an extension of this pattern, with changes in both the level and the mix of services provided. Administrative and support staff, who tend to increase proportionately in numbers during a period of declining enrolment, are likely to experience relatively greater cuts than instructional staff. There is some evidence to suggest that subsequent funding increases do not substantially alter these proportions.

Recent trends in the literature demonstrate that the problems associated with declining enrolment and economic recession are no longer of such importance. New and traditional issues have replaced them, including education reform, equity of resource distribution, provision of educational services for the handicapped, and alternative revenue sources for schools.

Chapter 3

Financial, Educational and Demographic Context

In order to establish the economic and political context within which the study is designed, it is necessary to consider in a preliminary manner certain relevant information. This chapter explains education funding practices in the four western provinces, and then gives a general picture of economic conditions, levels of education funding, enrolment changes, numbers of teachers, and teachers' salaries in those provinces from 1976 to 1987.

Education Finance in the Western Provinces

The four provinces studied exhibit basically similar education systems, and it is appropriate at this time to draw attention to the differences and similarities apparent in their attempts to achieve the common goal of providing adequate educational services to all students in an equitable manner.

In 1983 British Columbia replaced its incremental Basic Education Program (BEP) with a resource-cost model known as the Fiscal Framework. This modified foundation plan consists of a description of educational services (service levels) and a statement of the cost 'acceptable' to the Province of delivering these services in each school district (cost factors). In combination these provide a

method of determining what it should cost to deliver a provincially acceptable educational program in each school district. If districts wish to exceed these service levels they may do so, but the Province will share only in the cost of services described in the Fiscal Framework. Government grants (drawn from general revenue and the centralized collection and redistribution of non-residential property taxes) make up a minimum of 57% of the cost of delivering these services for each district. The comparative wealth of each district in terms of residential property assessment values per student determines the proportion of the remaining 43% to be paid by local taxpayers. The wealthier districts are responsible for the whole amount, while the poorest districts contribute only a very small percentage. Provincially, government grants represent approximately 75% of the shareable costs. Since 1986, if districts wish to raise additional amounts they may again increase local residential property taxes to do so (B.C. Ministry of Education, 1988b).

The funding of education in Alberta is also shared between the Province and local school boards. Most provincial funds are allocated through the School Foundation Program Fund (SFPF) which operates as a typical foundation grant plan; that is, a foundation level is set, a local contribution is determined based on local wealth, and school boards may raise additional funds. In Alberta the basic local levy is assessed only on non-residential properties, and supplementary levels

beyond the foundation level are raised from local residential and commercial assessments. The Supplementary Requisition Equalization Grant (SREG) attempts to equalize the burden of these additional taxes. Recent studies have identified numerous problems, including confusion over what constitutes a local as opposed to a provincial contribution, the number of special purpose grants that have developed, and the lack of control over educational expenditures (Lawton, 1982, 1987). These problems are fairly typical of a long-standing foundation plan which can work well in a stable situation, but requires constant adjustment and fine-tuning when enrolment changes and inflationary pressures distort the original concepts.

Saskatchewan also operates on a modified foundation plan, with elementary and secondary schools jointly funded by provincial and local authorities. The amount of operating expenditure eligible for provincial assistance is referred to as the 'total recognized expenditure' (i.e. recognized for grant purposes). The amount of the grant is the difference between the total recognized expenditure and the local revenue raised by applying a mill rate specified by the Province. The Education Development Fund is designed to support various initiatives, but over half is allocated using a modified form of equalization to ensure support for less wealthy boards (Lawton, 1987).

Manitoba has significantly restructured school finance following

the education finance reviews in 1982 and 1983 (Nicholls, 1983). The Province has moved from the Education Support Program (ESP) to the Government Support of Education Program (GSEP) which is designed to provide greater equity and to be more sensitive to inter-district variations. The GSEP provides three types of grants: block, categorical and equalization support. The block grant is a flat grant per weighted pupil, the 13 categorical grants cover various aspects of the education system from transportation to English as a Second Language (ESL) and small schools, and the equalization support grant recognizes differences in relative local wealth. Local authorities may raise additional funds by increasing the local levy. The GSEP funds come from consolidated revenue and province-wide levies on residential and non-residential property. These are considered as education taxes, although in fact they form part of the Province's consolidated revenue (Lawton, 1987).

All four provinces, therefore, fund public schooling through some combination of provincial general revenue and local property taxation. The bulk of the funding comes from the former source, and thus government decisions about the amount of financial support to be made available have a considerable effect on the operation of the school systems. The amount of local property tax revenue used for education, whether determined by provincial governments or local school authorities, is relatively small. The major inter-district

differences in revenue-raising capacity are generally recognized, but attempts at equalization do not change the reality that some districts are much wealthier than others. There are considerable variations apparent when the funding systems are examined in detail, a state of affairs which is further complicated by the proliferation of different names and acronyms used to describe often basically similar functions and concepts.

Funding Changes

Enrolment. As was noted earlier, funding levels may be affected by various factors, especially enrolment and economic conditions. The four provinces under review each experienced declining enrolment from 1976 to 1987, as is shown in Figure 2. British Columbia's public school enrolment dropped a total 9.9% over this period, with the rate of decline holding fairly constant until 1985 when it began to slow down before marginal increases in 1987. Manitoba experienced a similar pattern, but the total enrolment drop of 12.6% over the same period was even greater than British Columbia's. Saskatchewan's enrolment declined by 9% from 1976 to 1983, then showed a marginal increase (0.7%) from 1983 to 1986, and a slight drop (0.1%) by 1987. Enrolment in Alberta was much more stable, with only minor fluctuations over the period: down 1.8% from 1976 to 1979, up 2.6% by 1982, down 0.6% by 1984, up 0.8% by 1986 and down 0.1% by 1987 (Statistics Canada, 1976-1987: see Appendix A).

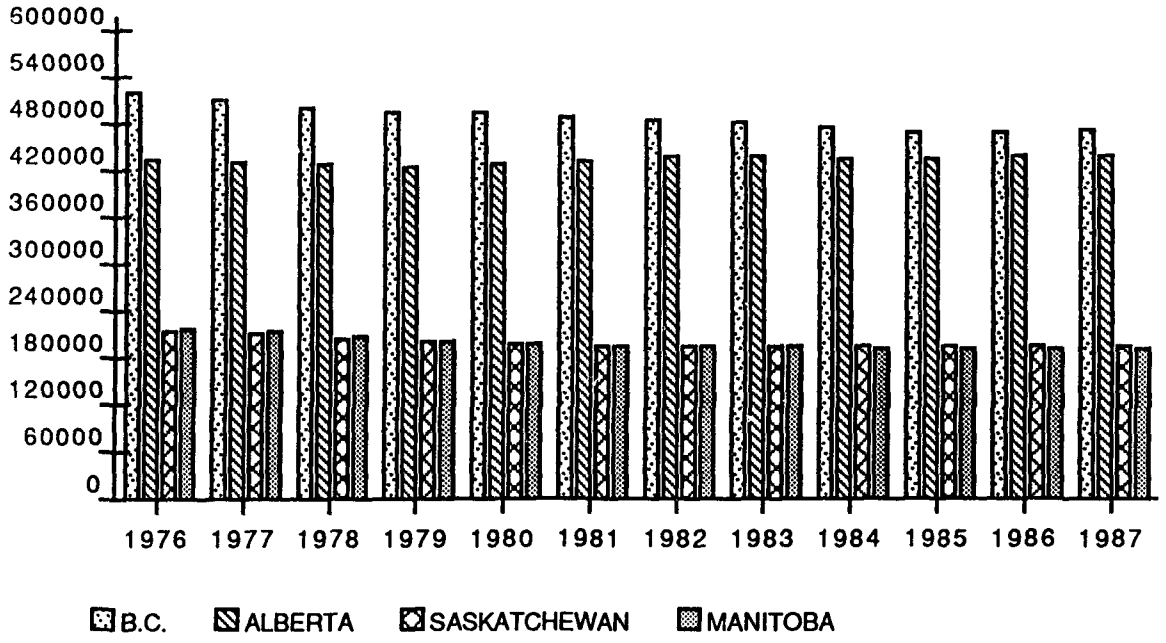


Figure 2: FTE enrolment 1976 - 1987.

Note: Figure compiled from Statistics Canada data.

Economic growth. The economies of the four provinces also showed different patterns of relative growth and stagnation. The percentage change in *per capita* Gross Domestic Product (GDP) can serve as an indicator of this. All four provinces displayed relatively rapid growth during the 1970's: in current dollars, from 1976 to 1981 Alberta's GDP increased at an average annual rate of 13.5%, British Columbia's at an average of 12.6%, Saskatchewan's at 11.8%, and Manitoba's at 9.7%. After 1981 the average rate of growth declined: Manitoba led the way with an average increase in GDP of 6.8% from 1982 to 1986, Alberta's GDP increased at an average rate of 4.9% until 1986 when a 9% drop occurred. In British Columbia and Saskatchewan GDP increased by an average of about 4% annually over this period (Department of Finance, Canada, 1988). This topic is addressed more fully in Chapter 4.

Funding per student. The question of actual levels of education funding is, as previously noted, more complex and difficult to determine. Definitions vary, different criteria are used, new finance systems confuse the issue and inflationary trends further complicate any attempt at comparison. Suggested indices of measurement which could alleviate some of these problems have been developed, and will be treated more fully later. At this stage it is sufficient to note that in the most general terms (gross educational expenditure per pupil) education funding per student increased 32.9% in real terms (i.e.

taking inflation into account) from 1976 to 1987. In 1976 the average expenditure per student in the four provinces was $1,816 and in 1987 it reached $2,413 (in 1976 dollars). In 1976 British Columbia ranked first, Manitoba second, Saskatchewan third and Alberta last. This order had changed dramatically by 1987: Manitoba increased per pupil expenditure by 42.2% in real terms to rank first, Saskatchewan increased expenditure by 35.3% to rank second, Alberta, with a 36.5% increase, moved to third place, and British Columbia ranked fourth, with a real increase in per pupil expenditure of 17.1% (Statistics Canada, 1976-1989: see Appendix A). The increases in current dollars (as can be seen in Figure 3) are more dramatic. Statistics such as these, however, are so general that any attempt to draw meaningful conclusions, especially qualitative ones, from them must be approached with caution. For instance, some jurisdictions include independent school students in the total count, and they may or may not receive government support. Variations in teachers' salaries also need to be taken into account. In fact, merely extracting sets of figures from Statistics Canada publications and relating one set to another, particularly on a comparative basis, may at best be very misleading. This can be illustrated by the fact that statistics from previous years are often revised in later editions, and thus different results may be obtained depending on which set of figures is used. This question will be discussed more fully later but even from the evidence provided here it is apparent that rates of increase in educational expenditure

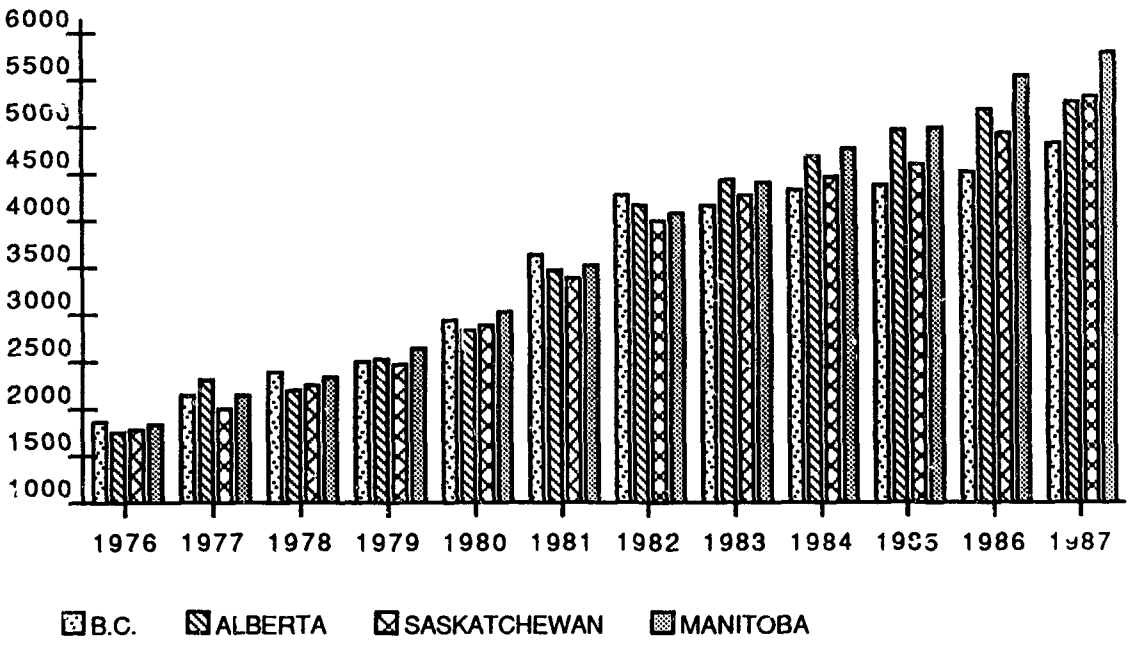


Figure 3: Gross provincial government expenditure per FTE pupil in current dollars, 1976 - 1987

Note: Figure compiled from Statistics Canada data.

differed widely from province to province over the period under review.

Teachers. There were 26,353 teachers in Britsh Columbia in 1976, and this number remained fairly constant over the next few years, rising to 26,937 in 1981. From that time, the number of teachers declined nearly 12% to 23,719 in 1985, before beginning to rise again (Figure 4). (It should be noted that this is an instance where Federal and Provincial statistics differ somewhat, but as inter -provincial comparisons are being considered here it was felt advisable to be consistent in the use of data sources.)

The number of FTE teachers in Alberta increased steadily from 21,622 to 24,308 by 1983, an increase of 12.4%. From 1984 to 1987 the number of teachers remained relatively stable. It is worth noting, however, that in 1985 Statistics Canada reported more teachers in Alberta than in British Columbia (24,112 compared to 23,719), an indication of the increases in Alberta and the decreases in British Columbia, as in 1976 there were nearly 5,000 more teachers in the latter province. In Saskatchewan in 1976 there were 10,689 teachers, and this figure did not vary by more than 2% over the entire period. The situation in Manitoba was very similar, with only minimal variation from the 1976 total of 11,428.

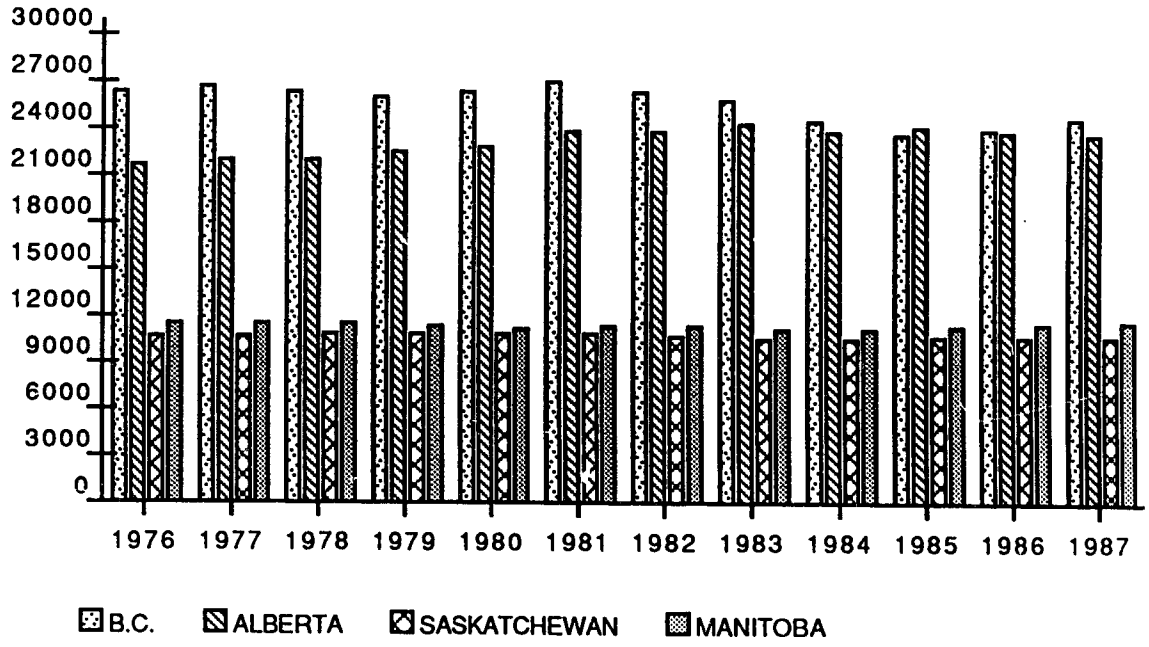


Figure 4: FTE teachers by province 1976 - 1987.

Note: Figure compiled from Statistics Canada data.

Teacher salaries. From 1976 to 1987 average teacher salaries in the four provinces rose 134.3% in current dollars from $16,523 to $38,717. Over the same period the Consumer Price Index (CPI) rose by 119.7%. As can be seen in Figure 5, average teacher salaries in Alberta, Saskatchewan and Manitoba increased at roughly the same rate. British Columbia, however, experienced much greater increases in average teacher salary from 1979 to 1983. The other three provinces experienced increases of similar size, but in the period 1981 to 1884. This difference can be demonstrated by examining the difference in average teacher salaries between the four provinces. In 1976 the difference was 18.5% from lowest to highest. By 1982 the spread had increased to 27.9%, but the catch-up pattern narrowed the gap to 9.6% in 1987.

Summary

This chapter showed that basically similar funding practices are followed in the four provinces, although minor differences are apparent. It also clarified the context of the study by examining the changes in economic conditions, the differences in enrolment patterns, the global changes in levels of financial support for public school education, as well as numbers and salaries of teachers in the four provinces from 1976 to 1987.

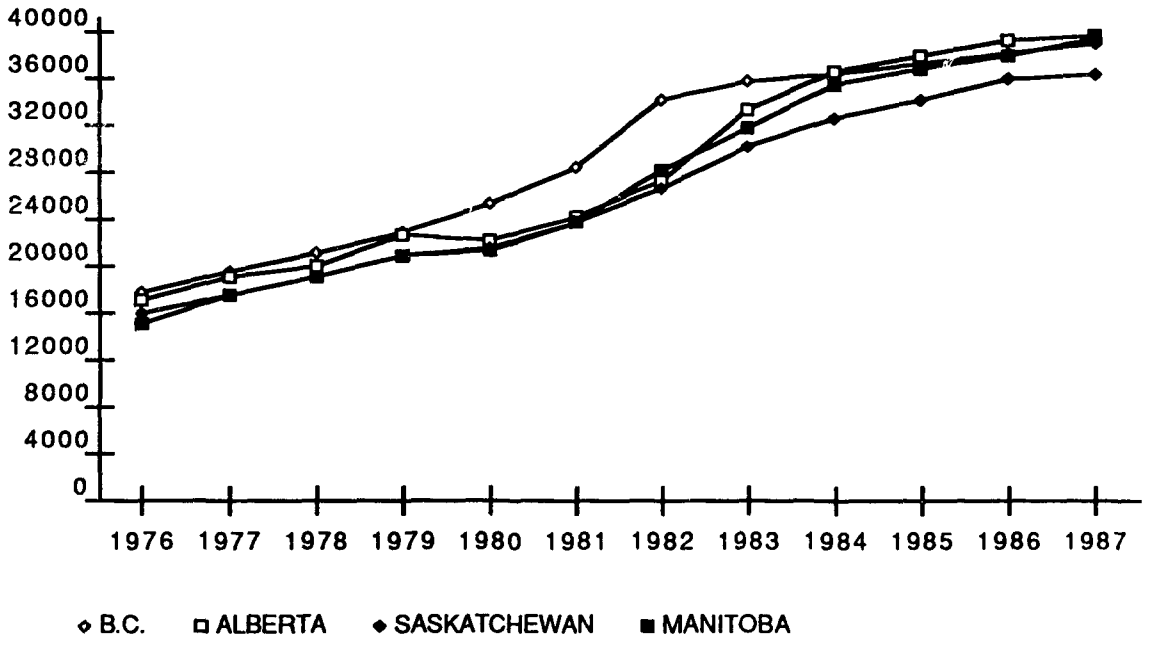


Figure 5: Average teacher salaries in current dollars 1976 - 1987.

Note: Figure compiled from Statistics Canada data.

Chapter 4

Research Methodology and Design

Conceptual Framework

The conceptual framework for this study has been developed primarily from the review of the literature and from the approaches taken by other researchers, especially Choy (1979, 1980a, 1980b) and Anderson and Mark (1983).

Change in any organization can result from many different factors, both internal and external. In this study changes came about as a result of external forces, over which the school systems in question had little or no control. Major funding decisions in Canadian school systems are generally made at the senior government level, with lesser decisions, especially regarding the allocation of funds to specific areas, being the prerogative of school boards and, to an even smaller extent, individual schools.

Although it is important to understand the factors influencing funding changes as well as their magnitude, some of which are addressed in this study, what is of more central interest here is the ways school systems react to these changes. Basically, organizations, including school systems, have two options when faced with the *fait*

accompli of global funding changes. They may choose to decrease (or increase) services equally, so that, for example, a 5% cut in funding at the provincial or district level results in an equal 5% cut in funding for every program or sector. This response has been called 'no change' (Choy, 1979, 1980; March and Simon, 1958) or a 'static reaction' (Owens, 1987), and is generally to be expected, at least initially. To put it in Lewin's (1951, 1953) terms, the system has refrozen at a different level, but with the same configuration and balance of forces.

However, due to the nature of operations of most school systems and the logistical constraints they entail, a static reaction is only feasible in the short term and in response to comparatively minor funding cuts. It should be noted that major funding *increases* would allow for this response, but research (e.g. Anderson and Mark, 1983) indicates that this is not necessarily the case. Major funding cuts (defined as greater than 5% by Cibulka (1987)) demand a different response, that of 'change' or 'dynamic reaction'. To take a simple example, the loss of one tenth of the teaching staff of a ten-teacher school means the loss of one classroom teacher, not the loss of 10% of teaching services in each of ten classes. In this case the level of educational services provided has changed, but so has the mix of services. Assuming, for the sake of example, that the school in question still has a principal, a secretary and a librarian, then the proportion of administrative to instructional personnel has increased

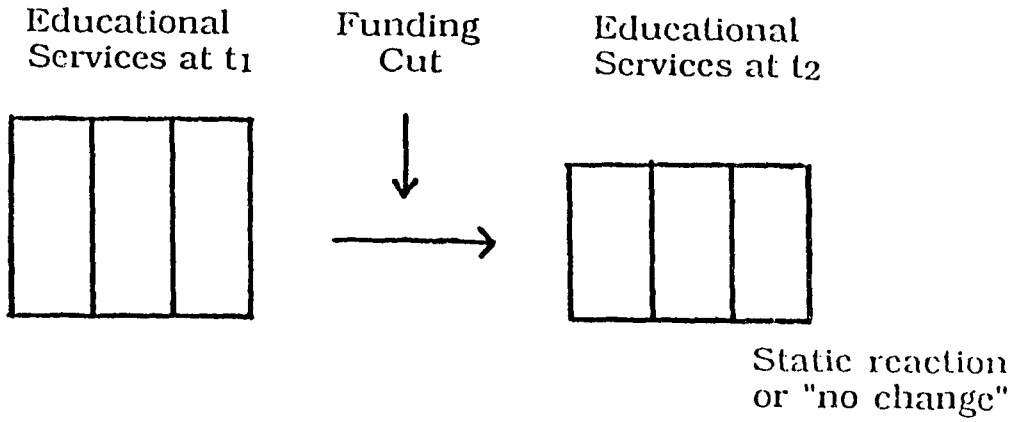
from 3:10 to 3:9. A graphic representation of the potential different types of reaction is shown in Figure 6.

The concept of static or dynamic response to environmental forces for change, also referred to as a change in the level or mix of educational services or both, is central to this study. The nature of the response or reaction indicates the relative importance attached by administrators to maintaining different aspects of the educational program, and has implications not only for school systems but for the wider sphere of administrative theory and educational philosophy.

Terminology

One of the major problems encountered in research of this type is that of ensuring rigorous comparability of statistics from one jurisdiction to another, and within jurisdictions over time. For example, three of the provinces to be studied (British Columbia, Alberta and Manitoba) introduced new funding formulae during the period under review. In addition, reported figures for average class size may or may not include special classes which are usually very small, average class size and pupil-teacher ratio are sometimes used synonomously, and 'teachers' may refer specifically to instructional personnel or include other certified personnel such as school and

(a)



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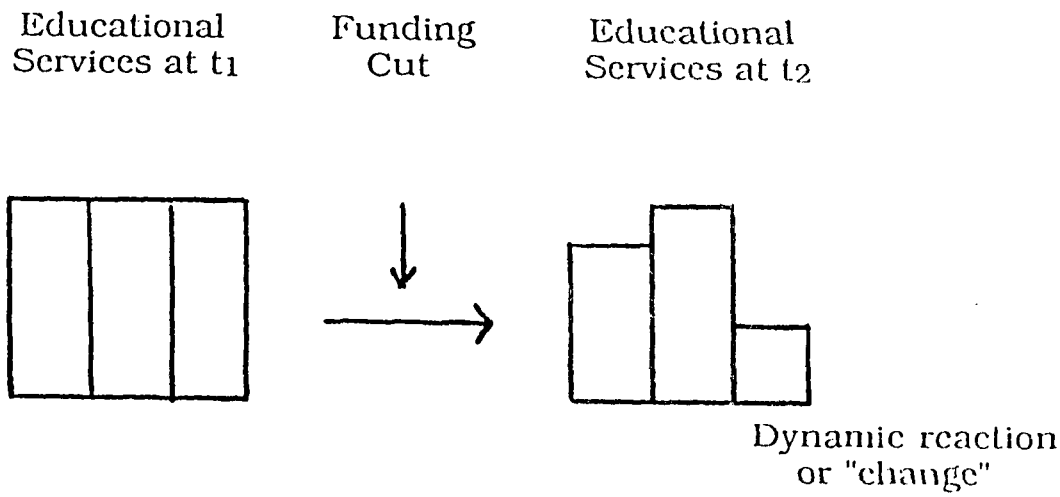

Figure 6: Hypothetical effects of a funding cut on (a) level of educational services only, and (b) both level and mix of educational services.

district administrators. It is proposed, therefore, that independent indices of measurement of levels and mix of educational services should be used, which could apply to all jurisdictions and could supplement existing figures.

The following suggested indices of measurement for levels and mix of services provided have been adapted from those used in the New York City school system and from those developed by Choy (1979, 1980a, 1980b).

Levels of service

Staffing Unit (SU): In the macro-analysis, *gross* provincial government expenditure on public school education divided by average teacher salary. In the micro-analysis, funds allotted for public school *instruction* divided by average teacher salary.

Staffing Units Per Pupil (SUPP): Total Staffing Units divided by total FTE enrolment.

By comparing percentage changes in enrolment, SU and SUPP a clear picture of changes in levels of service can be obtained. This method also discounts the effects of inflation.

Service Mix Index (SMI)

The major factor considered here was the proportion of

instructional staff to administrative and support staff as an indicator of the relative importance assigned to these positions by school districts.

The following method of analysis, adapted from that used by Choy (1979, 1980a, 1980b), was used: the number of Administrative and Support Positions (ASP) was determined by subtracting the number of Instructional Positions (IP) from the Total Positions (TP) filled by certified teachers. Changes were measured thus:

$$\Delta \% IP = \frac{IP_2 \times 100}{TP_2} - \frac{IP_1 \times 100}{TP_1}$$

where IP and TP are defined above and subscripts 1 and 2 represent successive time periods. A positive ΔSMI (i.e. an increase in proportion of instructional positions) indicates a change in mix of services to preserve instruction at the expense of administrative and support services. A negative ΔSMI indicates the opposite. A ΔSMI equal to or close to zero means no change in the mix of services.

It was necessary to be judgemental in gauging how great a percentage change should be considered a dynamic reaction. This, in turn, leads to determining how great a deviation from zero change in the proportion of instructional positions can be assumed to indicate an equal preference for instructional and administrative and support services. Choy's research suggests that:

> a conservative definition of equal cuts would use an x of 1.0 [where x = deviation from zero percent change] and a broader one, an x of 1.5. Any greater deviation is probably more reasonably considered indicative of selective cuts. (1979:64).

The appropriateness of this suggestion to the proposed study will be examined in Chapter 6.

It should again be stressed that the suggested units of measurement such as SU, SUPP and SMI should be viewed as indices rather than real numbers of teachers or positions. A subsidiary purpose of this exploratory study was to assess the usefulness of such indices for potential future comparative studies.

Other Terms

Enrolment. Full-Time Equivalent (FTE) students attending public schools on September 30 of each year.

School District Wealth. Taxation base per pupil available to School Districts, usually reported as "assessed value per pupil". In British Columbia there were significant changes in how this was determined over the period studied. From 1978 the assessments were based on market value, and thus this year (rather than 1976) was used as a base in the micro-analysis. In 1982 the British Columbia provincial government removed the right of school districts to tax non-residential property, thus deleting that category of property from the

available taxation base. This had the effect of dramatically changing the rank order of 'rich' and 'poor' districts, but at the same time the right of the 75 school districts to raise *any* additional taxes was removed, and was not restored intil 1986.

Instructional Staff. FTE certified teachers engaged in classroom instruction.

Administrative and Support Staff. FTE certified teachers employed by a school district in administrative and support positions, including such categories as principals, counsellors and district-based educational staff.

Research Questions

To attain the purposes set out in Chapter 1, the following research questions were developed:

1. Is there an observable relationship between economic growth as measured by Gross Domestic Product (GDP) *per capita* and provincial government financial support for public schooling in the Provinces of British Columbia, Alberta, Saskatchewan and Manitoba between 1976 and 1987?

2. What fluctuations in government financial support for public school education occurred in the four provinces?

3. Which years represented the high and low points of funding levels?

4. Which province experienced the largest fluctuations in funding levels and associated changes in levels of educational services provided?

5. What was the impact of these fluctuations in government financial support on the level of educational services provided in the four public school systems as measured by Staffing Units (SU) and Staffing Units Per Pupil (SUPP)?

6. For the years identified above, what specific changes occurred in the level of educational services provided by British Columbia school districts as measured by SU and SUPP?

7. For the years identified above, what specific changes occurred in the mix of educational services provided by British Columbia school districts in terms of changes in the proportions of school district personnel allocated to instructional, administrative or support positions?

8. What relationship did these changes bear to characteristics of school districts?

9. What implications do these findings have for educational policy-makers, practitioners, and researchers?

10. What recommendations can be made for improving government legislation, policies, and procedures concerning education finance?

Design

This investigation falls into two major parts, an overview or macro-analysis of funding changes and their consequences in the four provinces, and an in-depth study, or micro-analysis, of specific changes in levels and mix of educational services in British Columbia as shown in a sample of school districts.

Macro-analysis

The first part of the investigation examined various aspects of education funding in the provinces of British Columbia, Alberta, Saskatchewan and Manitoba from 1976 to 1987, specifically:

(1) The relationship between Gross Domestic Product (GDP) and the amount of money allocated by provincial governments to

support public school education. This was examined to determine whether there was a significant correlation.

(2) Funding levels for public school education in the four provinces. These were examined to identify specific years during which there were major increases or decreases in education funding.

(3) Levels of service. For years representing the high and low points in funding Staffing Units (SU) and Staffing Units Per Pupil (SUPP) were calculated as defined above to determine changes in levels of educational services provided which might be associated with the changes in funding levels.

Data for this analysis were obtained primarily from published Federal and Provincial statistics. A preliminary examination indicated that the availability and quality of the data were probably acceptable as (a) the information required was fairly general in nature, and (b) it would be used mainly to make comparisons within rather than between individual provinces. 1976 was selected as the base year as it represented the peak of student enrolment.

Micro-analysis

Data for this part of the analysis were obtained from information collected from School Districts by the British Columbia Ministry of

Education. Pilot research indicated that, among the western provinces, British Columbia experienced the most dramatic increases and decreases in funding levels. In addition, data available from British Columbia appeared to be more complete, consistent, and accessible than those from other provinces, partly as result of the 1982 introduction of a resource-cost funding model which required districts to submit more detailed and standardized information to the Ministry of Education. An examination of the *Statistical Supplement to the Annual Report of the British Columbia Ministry of Education* (1989a, 1989b) confirmed this impression. For these reasons the second part of the investigation concentrated on a sample of British Columbia school districts to analyse in depth the impact of changes in funding levels on the allocation of instructional, administrative and support personnel at the district and provincial level.

Sample

The 75 school districts in British Columbia share few common characteristics concerning size, student population, or other demographic features. Some cover only a few square miles, while the largest is said to be bigger than France. Enrolment ranges from under 500 to over 50,000 students, and population distribution varies from concentrated urban areas to scattered settlements and villages. In the light of this variation, a stratified random sample can provide the most representative picture of the districts (Mason & Bramble, 1978;

Popham & Sirotnik, 1973).

School Districts in British Columbia can be divided into six groups based on size of student population (British Columbia Ministry of Education, 1988). The percentage of School Districts which fall into each group was calculated, and served as the basis for a stratified random sample of 20 districts representing 26.7% of the total of 75 districts (Table 1).

Sampling Procedure

The 75 School Districts were divided into six categories based on FTE enrolment, and the percentage of Districts in each category was calculated as described above. A table of random numbers (Popham and Sirotnik, 1973, p.367) was used to identify the Districts required to fill each category. Alternate Districts were also randomly selected in case of possible data problems with the originally selected Districts, but their use was not required. The results of this sampling procedure are shown in Table 2.

Analysis of Data

The following analysis of the data was then undertaken:

(1) For the periods identified by the macro-analysis as having increases or decreases in funding, SU and SUPP were calculated for each district to determine the changes in levels of service consequent

Table 1

British Columbia School Districts by Enrolment, Showing Method of Determining Stratified Sample.

	POPULATION		SAMPLE	
Enrolment	N	%	n(actual)	n(rounded)
0-1,000	11	14.7	2.94	3
1,001-2,500	19	25.3	5.06	5
2,501-5,000	18	24.0	4.80	5
5,001-10,000	13	17.3	3.46	3
10,001-20,000	10	13.3	2.66	3
> 20,000	4	5.3	1.06	1
Totals	75	99.9[a]	19.98[b]	20

[a]Does not total exactly 100 due to rounding.

[b]Does not total exactly 20 due to rounding.

Source: Calculated from B. C. Ministry of Education statistics.

Table 2

Stratified Random Sample of 20 British Columbia School Districts.

Category 1: FTE Enrolment 0 - 1,000 (n = 3)
School District 10 (Arrow Lakes)
School District 13 (Kettle Valley)
School District 49 (Central Coast)
Alternates: SD 84 (Vancouver Island West); SD 76 (Agassiz-Harrison)

Category 2: FTE Enrolment 1,000 - 2,500 (n = 5)
School District 9 (Castlegar)
School District 14 (South Okanagan)
School District 31 (Merritt)
School District 55 (Burns Lake)
School District 81 (Fort Nelson)
Alternates: SD 86 (Creston-Kaslo); SD 32 (Hope)

Category 3: FTE Enrolment 2,501 - 5,000 (n = 5)
School District 7 (Nelson)
School District 11 (Trail)
School District 54 (Bulkley Valley)
School District 60 (Peace River North)
School District 89 (Shuswap)
Alternates: SD 69 (Qualicum); SD52 (Prince Rupert)

Category 4: FTE Enrolment 5,001 - 10,000 (n = 3)
School District 28 (Quesnel)
School District 59 (Peace River South)
School District 72 (Campbell River)
Alternates: SD 27 (Cariboo-Chilcotin); SD 33 (Chilliwack)

Category 5: FTE Enrolment 10,001 - 20,000 (n = 3)
School District 23 (Central Okanagan)
School District 38 (Richmond)
School District 57 (Prince George)
Alternates: SD 44 (North Vancouver); SD 35 (Langley)

Category 6: FTE Enrolment > 20,000 (n = 1)
School District 43 (Coquitlam)
Alternates: SD 36 (Surrey); SD 61 (Greater Victoria)

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to funding changes.

(2) For the same identified periods and the same sample districts, the change in the mix of educational services provided was studied by examining the change in mean percentage of instructional positions. These changes were tested for statistical significance by using a *t* Test.

Variation in mix of services

British Columbia school districts have many characteristics in common. They all operate under the constraints of the *School Act*, are locally governed in the same fashion, and use curricula and textbooks prescribed in the main by the provincial government. The same funding formula applies to all, and although teacher salaries (which make up nearly 80% of total expenditure) are determined by agreements within individual districts, there is in fact little variation. Only nine of the 75 districts report average salaries which differ more than 5% from the provincial mean (British Columbia Ministry of Education, 1989a), and even these differences may be explained more accurately by teacher characteristics than by salary scales.

There are, however, large differences in enrolment (from 500 to nearly 50,000), in area, and in relative wealth as measured by assessed residential property value per pupil (from $4,587 to $553,063) (British Columbia Ministry of Education, 1989b). In addition there are

great differences in the students themselves: one indicator of this is the amount spent on Special Education, a category which includes not only the physically and mentally handicapped but also First Nations students and English as a Second Language (ESL) students. This varies from 7.1% to 84.2% of instructional costs (British Columbia Ministry of Education, 1988a). The figures quoted are, naturally, the extreme cases, and the bulk of the districts are more closely grouped, but they do serve to illustrate the tremendous diversity.

On these grounds alone it is reasonable to expect different responses to changes in funding levels, and previous research on similar topics has shown that for various reasons significant differences do exist at both school and district levels (e.g. Anderson and Mark, 1983; Berger, 1983; Choy, 1979, 1980a, 1980b; Cibulka, 1983; Davies, 1982; Phelan, 1983).

It has been demonstrated that, as funding levels increase, there is a tendency to increase administrative and support positions faster than instructional positions (Anderson and Mark, 1977; Lesser, 1979), even if enrolment is declining. A similar tendency was observable in British Columbia when, at a time when many new teachers were being hired, Average Class Size declined more slowly than the Pupil-Teacher Ratio, indicating a growing proportion of non-instructional personnel (Fleming and Anderson, 1984). (There were no *a priori* expectations

as to how any of the variables to be investigated would affect this tendency, so that specific hypotheses are not presented. However, the question was examined in the course of the study, and results are reported in Chapter 6.) When funding levels decrease, however, this trend is not necessarily reversed (Choy, 1980a, 1980b), and other factors may become increasingly important.

While there is therefore no *a priori* expectation concerning the role of factors other than funding in periods of funding increase, hypotheses were developed to account for the expected variation in the change in mix in services during periods of funding decrease.

Hypotheses

Enrolment. It has been suggested that as organization size increases the administrative and support components tend to grow at a faster rate than the productive components (Weber, 1946). To use Mintzberg's (1981) terms, the professional bureaucracy becomes a machine bureaucracy with a larger and more stable middle line, techno-structure, and support staff. Thus a school district serving a large number of students is more likely than a smaller district to have administrative and support positions which could be cut before teaching positions. Based on this assumption, the following hypothesis was developed:

H1: When funding cuts occur, large school districts tend to favour instruction over administration more than small districts.

Wealth. Relatively wealthy school districts have more funds available for non-instructional personnel in administrative and support positions, and thus have the ability to reduce the number of these positions first. In a related idea, Choy (1980b) found that the parents of children in wealthier New York City schools exerted more pressure to maintain class size, which tends to confirm the suggestion. This rationale led to the development of the following hypothesis:

H2: When funding cuts occur, wealthy school districts tend to favour instruction over administration more than poor districts.

Special Education. Districts with a high proportion of special needs students are expected to find it harder to cut administrative and support personnel because of the nature of their duties and the stricter control over funds allocated to special education programs. In this regard, Cibulka's (1983) study of urban school systems found that, in response to enrolment loss and financial decline, additional personnel were hired for compensatory programs (e.g. handicapped and bilingual education) while the regular teaching force was reduced.

To test this finding in another situation the following hypothesis was developed:

H3: When funding cuts occur, school districts which spend a large percentage of instructional funds on special education tend to favour administration over instruction more than those which spend a small percentage.

Dispersion. A minimum administrative and support staff is required regardless of district size or wealth. Districts where the student population is scattered over a very large area were expected to be more likely to be close to that minimum, making it more difficult to cut administrative and support positions. To test this assumption, the following hypothesis was developed:

H4: When funding cuts occur, school districts with a widely dispersed student population tend to favour administration over instruction more than school districts which are more compact and demographically concentrated.

Static or dynamic response. As discussed in the Literature Review, organizations tend to favour a static or 'no-change' response to environmental pressures for change. For this reason, the percentage of instructional positions in a district before any funding change is likely to be relevant in that it may constrain the scope of reductions in

service levels. Choy (1979) found the change in the mix of services was significantly related to the pre-cut mix of services, and to verify that finding in another situation the following hypothesis was developed:

H5: When funding cuts occur, the tendency to preserve instruction will be greater in districts where the prevailing percentage of instructional positions is low.

Regression analysis

The foregoing hypotheses were tested using Ordinary Least Squares Regression Analysis. Data comprised a stratified random sample of 20 observations from 75 individual school districts in the years 1976 to 1987. The dependent variable in the regression equations was the change in the mix of services as measured by the changes in the percent instructional positions (ΔSMI) between the five identified time points which complete five alternating periods of rising and falling levels of funding (1978, 1979, 1982, 1986, 1987). The dependent variable was measured as an annual average change between each pair of time points. The independent variables were measured at the base year of each period. Their operational measures are listed in Table 3.

Table 3

Independent variables for regression equations.

Enrolment (SP): Student Population in Full Time Equivalent (FTE) students attending public schools on September 30.

Wealth ($PP): Locally available taxation base per FTE student.

Special Education (SPED): Percentage of Instructional Budget spent on special needs students, measured by Function 3 of the Fiscal Framework as a percentage of Functions 1 to 7.

Dispersion (DISP): Number of FTE students per square mile.

Status (STAT): Percentage of Instructional Positions at the base year of each period.

Chapter 5

Results

Macro-analysis

Research Question 1

Is there an observable relationship between economic growth as measured by Gross Domestic Product (GDP) per capita and provincial government financial support for public schooling in the Provinces of British Columbia, Alberta, Saskatchewan and Manitoba in the period studied?

With the exception of the correlations reported in the first section, the statistics presented are descriptive rather than inferential. As was noted in Chapter 4, it seems inapropriate in an exploratory study of this nature to draw specific conclusions from the figures available because of their limitations. Nevertheless, the results of the analysis provide some evidence of consistent patterns in the four provinces over the period studied. GDP has been indexed (1976 = 100), and expenditure is described in current dollars unless otherwise stated.

British Columbia. Nominal GDP increased at an average annual rate of 12.6% from 1976 to 1981. From 1982 to 1987 it increased at an annual average rate of 3.7%. Over the entire period from 1976 to 1987 GDP increased 143.9% in current dollars, at an average annual rate of 13.1%.

Again in current dollars, the British Columbia government's gross financial support for public school education increased 112.0% from $972.3 million in 1976 to $2,061.6 million in 1982, at an annual average rate of 13.5%. There was a 3.2% drop to $1,996.2 million in 1983, then expenditure increased at an annual average rate of 3.2% to $2,261.7 million in 1987. This gives an overall increase of 132.6% in current dollars from 1976 to 1987, and an overall average increase of 12.1% *per annum*.

Using the Pearson Product-Moment Correlation Coefficient, a significant positive correlation was found between GDP and expenditure ($r = .987$; $p < .001$). The effect of this relationship can be shown graphically by indexing GDP and expenditure (1976 = 100), as in Figure 7. The Consumer Price Index (CPI) is included in this figure to show the effects of inflation.

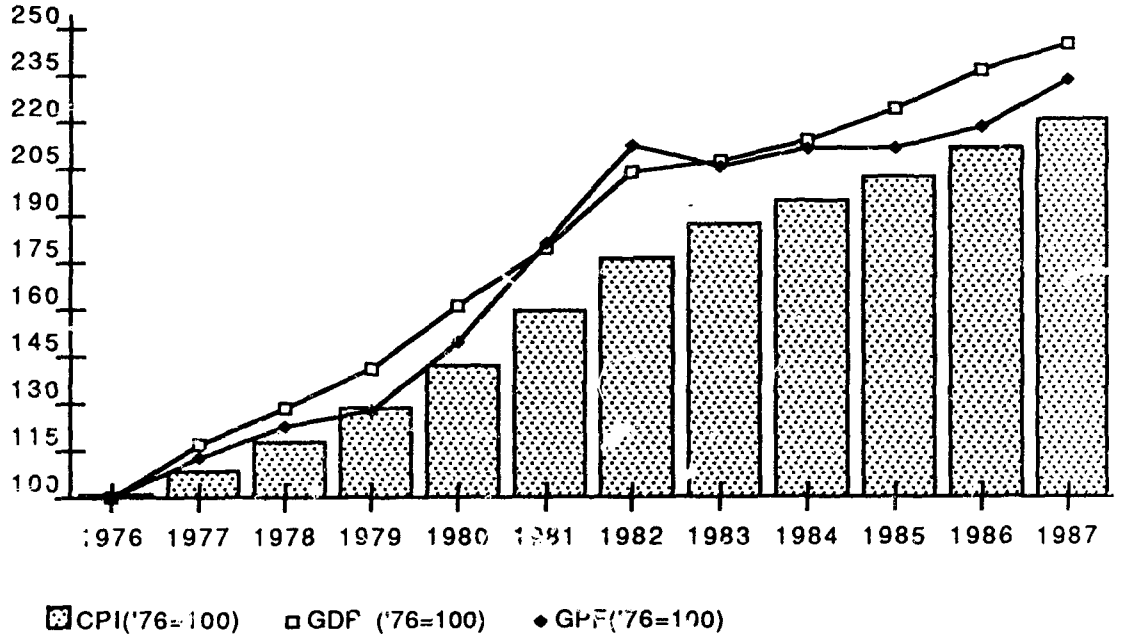

Figure 7: British Columbia: Gross Domestic Product (GDP), Gross Provincial Funding for education (GPF) and Consumer Price Index (CPI), 1976-1987. (1976 = 100)

Source: Caculated from Statistics Canada data.

Alberta. Alberta's nominal GDP increased at a slightly faster rate than British Columbia's from 1976 to 1981 (13.5% annual average increase). From 1981 to 1985 the rate slowed to an annual average increase of 4.9%, before a drop of 9% in 1986. The overall increase in GDP from 1976 to 1987 in current dollars was 134.4%.

Gross government expenditure on public schooling increased sharply (31.2%) from $758.9 million in 1976 to $995.9 million in 1977. After a 5.9% drop in 1978, there was a series of rapid increases until 1982. In fact, expenditure increased 93.7% from $937.5 million in 1978 to $1,816.4 million in 1982. From that date the rate of increase slowed, but funding continued to rise to $2,293.7 million by 1987, giving an overall increase of 202.2% in current dollars from 1976 to 1987.

The Pearson Correlation Coefficient was calculated as it was for British Columbia, and a significant positive corrrelation was found ($r = .980$: $p < .001$). This relationship is demonstrated in Figure 8.

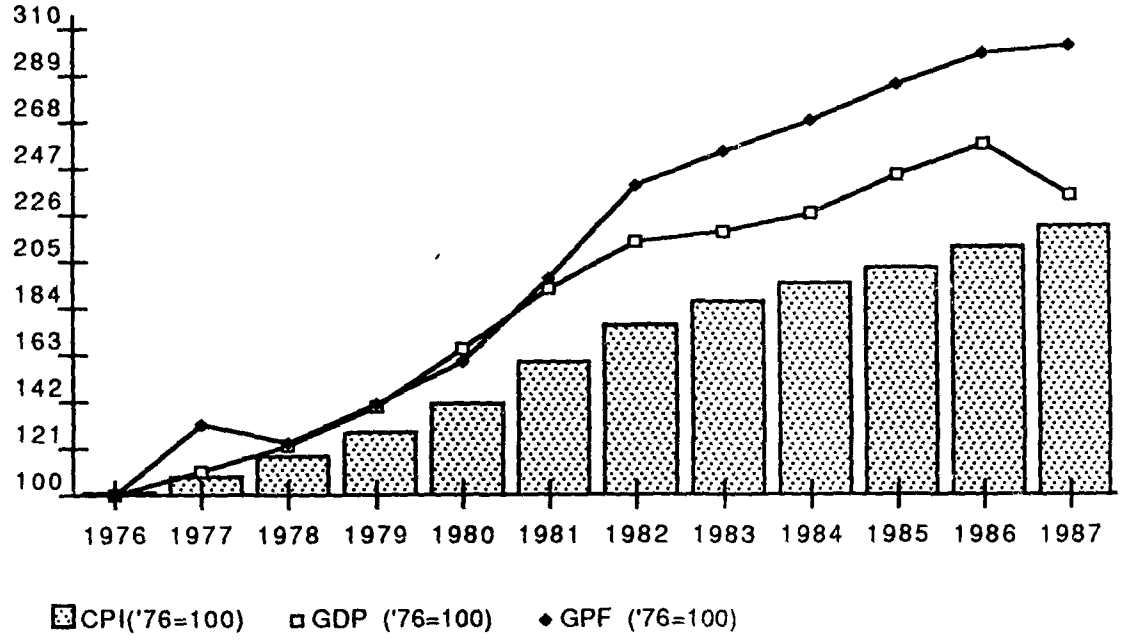

Figure 8: Alberta: Gross Domestic Product (GDP), Gross Provincial Funding for education (GPF), and Consumer Price Index (CPI), 1976-1987. (1976 = 100)

Source: Calculated from Statistics Canada data.

Saskatchewan. Nominal GDP in Saskatchewan followed a similar pattern. From 1976 to 1981 GDP increased at an annual average rate of 11.7%, including a very small decrease of 1.9% in 1977. In 1982 and 1983 GDP increased at less than 2.0% annually before a 9.4% increase in 1984. The economy then slowed again, with a 1.9% increase in 1985 and a 0.8% drop in 1986. The overall increase was 123.6%, somewhat less than in either British Columbia or Alberta.

Gross government expenditure on public school education, however, showed a much more consistent pattern of growth in Saskatchewan than in either British Columbia or Alberta. In current dollars, expenditure increased from $379.8 million in 1976 to $1,034.1 million in 1987: a total increase of 172.3%, at an annual average rate of increase of 15.7%.

The Pearson Correlation Coefficient was calculated as indicated previously, and a significant positive correlation was found between GDP and expenditure ($r = .988$; $p < .001$). This relationship can be seen in Figure 9.

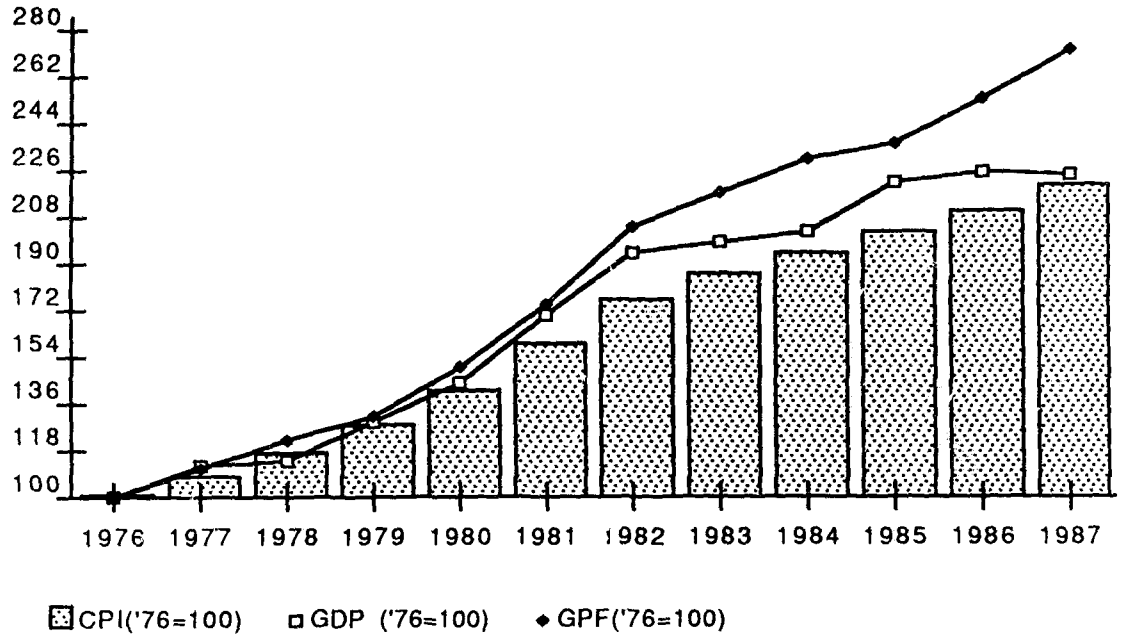

Figure 9: Saskatchewan: Gross Domestic Product (GDP), Gross Provincial Funding for education (GPF), and Consumer Price Index (CPI), 1976-1987. (1976 = 100)

Source: Calculated from Statistics Canada data.

Manitoba. *Per capita* GDP in Manitoba increased more than in any of the other three provinces studied: 161.1% from 1976 to 1987. The slower rate of increase in 1977 and 1982-83 evident in Saskatchewan was also apparent in Manitoba, but GDP still increased at an annual average rate of over 5% in those years. From 1984 to 1986 GDP increased at an annual average rate of 8.9%, much faster than in the other three provinces.

Changes in gross government expenditure on public school education were also very similar to those in Saskatchewan, with an annual average increase of 15.9% from $400 million in 1976 to $1,099.6 million in 1987. This gives an overall increase of 174.9% in current dollars.

The Pearson Correlation Coefficient between GDP and expenditure was also calculated, and a significant positive correlation was found ($r = .999$; $p < .001$). This strong relationship can be seen in Figure 10.

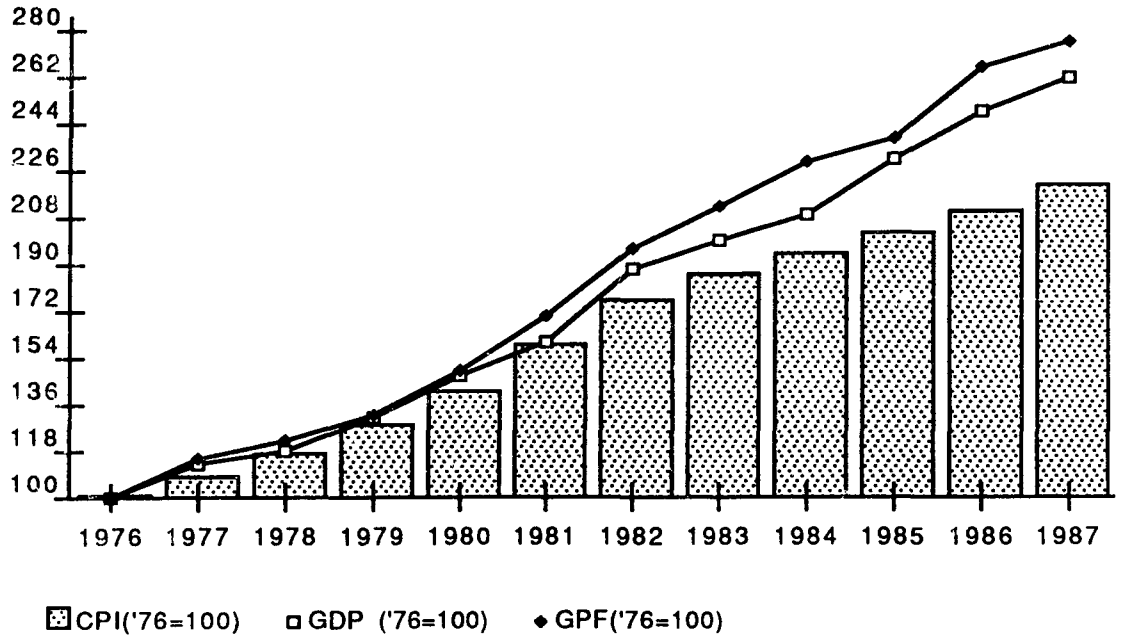

Figure 10: Manitoba: Gross Domestic Product (GDP), Gross Provincial Funding for education (GPF) and Consumer Price Index (CPI), 1976-1987. (1976 = 100).

Source: Calculated from Statistics Canada data.

Provincial Between-Group Correlation. The Pearson Correlation Coefficient was also calculated for the four provinces taken together (48 observations). Again a significant positive correlation was found between GDP and expenditure ($r = .664$; $p < .001$). The within-group and between-group correlations are summarized in Table 4.

Table 4

Pearson Correlation Coefficients between Gross Domestic Product and Provincial Government Expenditure on Public School Education 1976-1987.

British Columbia	.987*
Alberta	.980*
Saskatchewan	.988*
Manitoba	.998*
All provinces	.664*

(* $p < .001$)

Summary. In all four provinces a highly significant positive correlation was found between GDP and gross provincial government

expenditure on public schooling. A significant positive correlation was also found when the provinces were considered together. It is also worth noting that the expenditure index was always higher than the GDP index in Saskatchewan, Manitoba and Alberta (except in 1980), whereas the opposite was most often the case in British Columbia.

Research Questions 2 and 3

2. *What fluctuations in government financial support for public school education occurred in the four provinces?*

3. *Which years represented the high and low points of funding levels?*

As the previous section demonstrated, gross provincial government expenditure on public school education increased by an average of 170.5% in current dollars from 1976 to 1987. In constant (1976) dollars, however, a different picture emerges.

British Columbia. Government expenditure increased 20.4% from $972.3 million in 1976 to a peak of $1,170.3 million in 1982. This included a decrease in 1979 to $965.6 million, the lowest level in constant dollars. From 1982 to 1986 real expenditure dropped to $1,003.0 million, before an increase to $1,029.4 million in 1987. There was a total increase of 5.9% over the whole period studied.

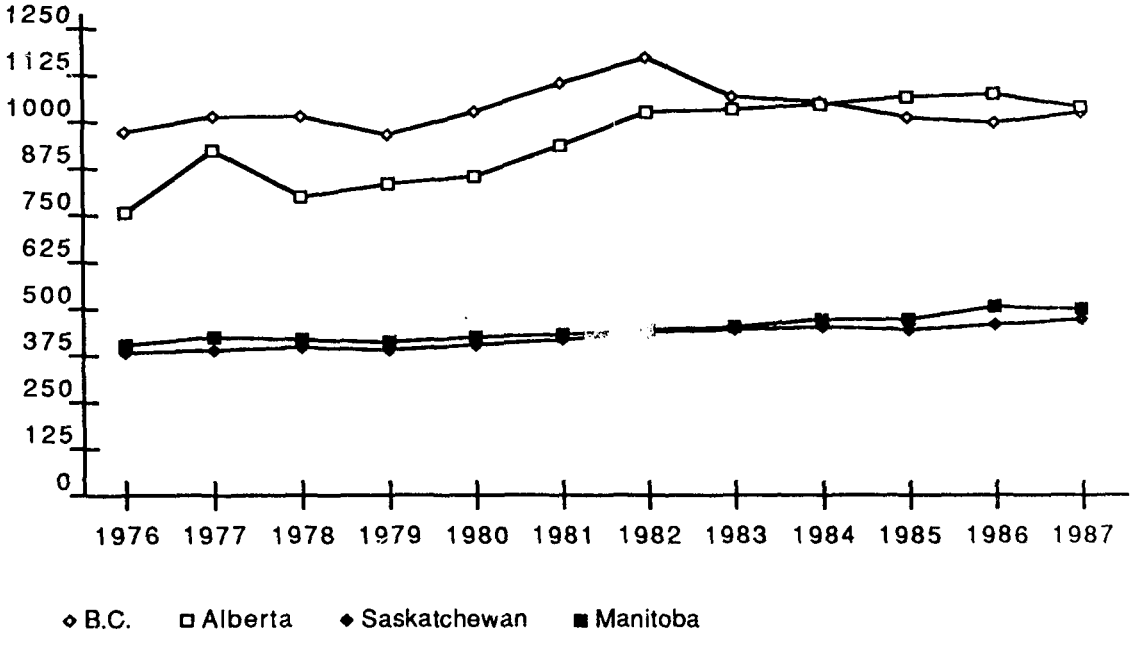

Figure 11: Provincial government funding for education.

(Constant 1976 dollars x 1,000,000).

Note: Calculated from Statistics Canada data.

Alberta. Government expenditure jumped 21.6% from $758.9 million in 1976 to $922.6 million in 1977, before dropping to $798.0 million in 1978. From this date funding increased consistently to a peak of $1,075.5 million in 1986, before a decrease to $1,043.9 million in 1987. Over the entire period, funding increased 37.6% in constant 1976 dollars, approximately six times as much as in British Columbia.

Saskatchewan. Funding in Saskatchewan, as was seen in a previous section, was much more stable. Apart from two small decreases (1.2% in 1979 and 1.0% in 1985) expenditure increased fairly steadily in constant 1976 dollars from $379.8 million in 1976 to $470.7 million in 1987, the peak year. This represents an overall increase of 23.9% for the period.

Manitoba. A generally similar pattern could be seen in Manitoba, where apart from a 2.8% decrease in 1978-9, funding increased quite steadily from $400.0 million in 1976 to $503.5 million in 1986. There was a small decrease (0.8%) in 1987, but over the entire period funding increased 25.1% in real terms.

Summary. Funding increases in constant dollars showed considerable variation from province to province over the period under review. Alberta increased funding by over 35%, and Manitoba

and Saskatchewan by approximately 25%, while the increase in British Columbia was less than 6%. All provinces experienced a net drop in real terms in 1978 and/or 1979, and some slowdown or decline in the 1980s: funding levels in British Columbia declined for four years (1983-1986) before rising again in 1987, Saskatchewan's funding declined slightly in 1985, and Alberta and Manitoba both experienced a drop in 1987.

Research Question 4

Which province experienced the largest fluctuations in funding levels and associated changes in levels of educational services provided?

As can be seen in Table 5, when expenditure is measured in constant 1976 dollars, there was a considerable variation in the magnitude and frequency of changes in government expenditure on public school education, and thus in funding levels, over the eleven annual periods. (Table 5 shows the number of increases and decreases in funding, the average size of the changes regardless of sign, and the number of changes greater than 5%.)

Table 5

Frequency and Magnitude of Annual Percentage Changes in Funding Levels (constant 1976 dollars).

	Increases	Decreases	Average % change	Changes > 5%
B.C.	6	5	4.22	4
Alberta	9	2	6.20	4
Saskatchewan	9	2	2.39	1
Manitoba	8	3	2.71	2

Source: Calculated from Statistics Canada data.

British Columbia, with six increases and five decreases in funding experienced the most frequent changes. None of the other three provinces had more than three decreases from year to year. The average annual change in Alberta (6.20%) was greater than in British Columbia, but it should be remembered that most of the changes in Alberta were increases in real terms. If we accept Cibulka's (1987) definition of major funding changes as being those greater than 5%, then British Columbia and Alberta both experienced four major changes, Manitoba two, and Saskatchewan only one.

Research Question 5

What was the impact of these fluctuations in government financial support on the level of educational services provided in the four public school systems as measured by Staffing Units (SU) and Staffing Units Per Pupil (SUPP)?

Levels of service are measured by the indices described in Chapter 4, Staffing Units (SU) and Staffing Units Per Pupil (SUPP). SU are determined by dividing provincial expenditure on education by average teacher salaries, and SUPP are determined by dividing SU by FTE enrolment.

Staffing Units and funding fluctuations. As has already been shown, funding levels varied in each province and from province to province between 1976 and 1987, with British Columbia experiencing the largest and most frequent changes. Changes in SU, however, are not as closely associated with funding levels as might have been expected, especially in Manitoba. Table 6 shows the years in which funding levels varied directly with Staffing Units, regardless of whether the change in funding was positive or negative.

Table 6

Years in which provincial funding levels varied directly with Staffing Units.

	B.C	ALBERTA	SASK.	MANITOBA
1976-77	*	*	*	
1977-78	*	*	*	*
1978-79	*	*		
1979-80	*	*	*	*
1980-81	*	*	*	*
1981-82		*	*	
1982-83	*			
1983-84				
1984-85	*	*	*	
1985-86		*	*	*
1986-87	*		*	

The decreases in funding levels observed in all the provinces in 1978 and 1979 were accompanied by corresponding decreases in SU. In the 1980s, however, the pattern is not so clear. Funding decreases in British Columbia in 1983 and 1985 were accompanied by decreases in levels of service as measured by SU, as they were in Saskatchewan in 1987. However, in some cases funding increases did not result in increases in SU. British Columbia increased funding in 1982, but registered a decrease in SU. The same thing happened in Alberta and Saskatchewan in 1983 and 1984. Manitoba experienced the most extreme example of this pattern, with funding increases being accompanied by decreases in SU in five different years (1977 and 1982-85). Possible reasons for this apparent anomaly will be discussed in Chapter 6.

The magnitude of the changes in SU also varied from province to province, although SU peaked in each province in either 1981 or 1982 (see Figure 12).

SU in British Columbia increased 13.5% from 54,391 in 1976 to 61,734 in 1981 (including a decrease in 1979), and dropped to almost the original figure (55,642) before levelling off. From 1976 to 1987 SU in British Columbia increased by 6.0%. Alberta had the most dramatic increase in SU, which rose 49.6% from 1976 to the peak of

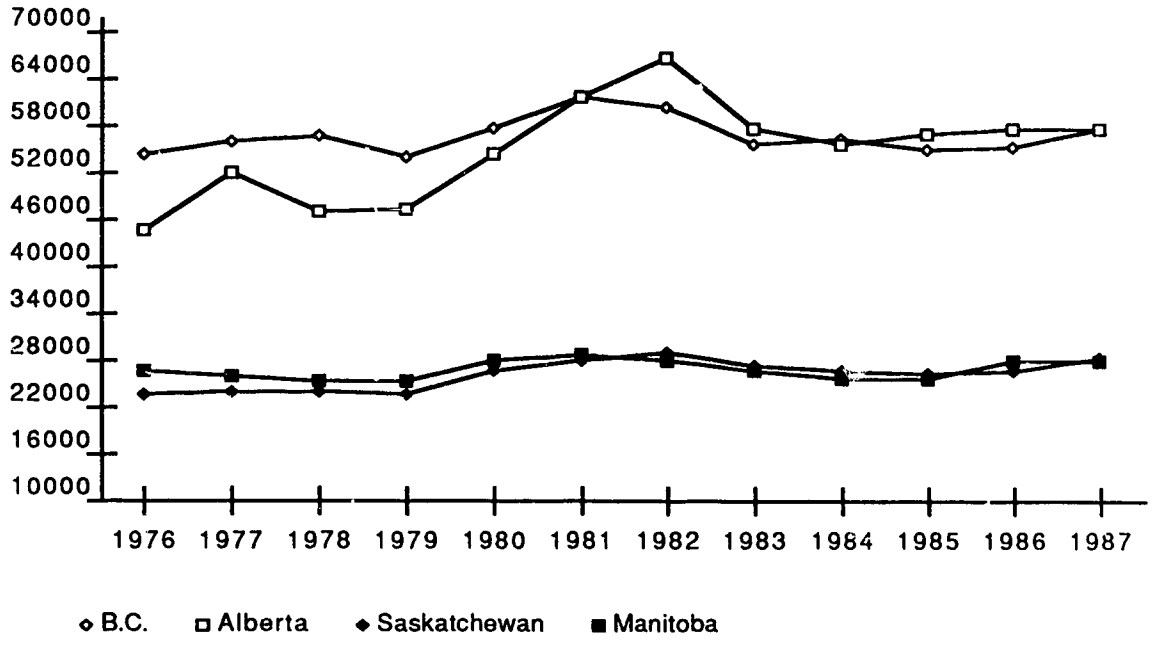

Figure 12: Changes in number of Staffing Units by province, 1976-1987.

66,566 in 1982 (again including a decrease in 1979). The sharp decrease observed in British Columbia also occurred in Alberta following the peak, with SU dropping to 55,554 by 1984. Overall SU in Alberta increased 29.4% over the period studied.

In Saskatchewan SU increased 22.5% from 23,611 in 1976 to 28,918 in 1982, more than in British Columbia, but considerably less than in Alberta. The decrease after the peak was much less obvious in Saskatchewan, and over the whole period SU rose 20.5%. Manitoba, although it experienced the second highest increase in funding, actually recorded the smallest gain in SU. From 1976 to 1981 SU increased 7.6% from 26,513 to 28,533. SU decreased from 1982 to 1985, and again in 1987. Over the entire period SU increased 5.1%.

Staffing Units Per Pupil and funding fluctuations. The other index of service levels used in this study, Staffing Units Per Pupil (SUPP), reinforces the relationship between funding and levels of service. In all but five cases (British Columbia, 1986; Saskatchewan, 1979; Manitoba, 1977, 1978, 1987) SUPP moved in the same direction as SU. The use of SUPP, however, enables a better comparison to be made between service levels in the four provinces as it takes enrolment into account (Figure 13).

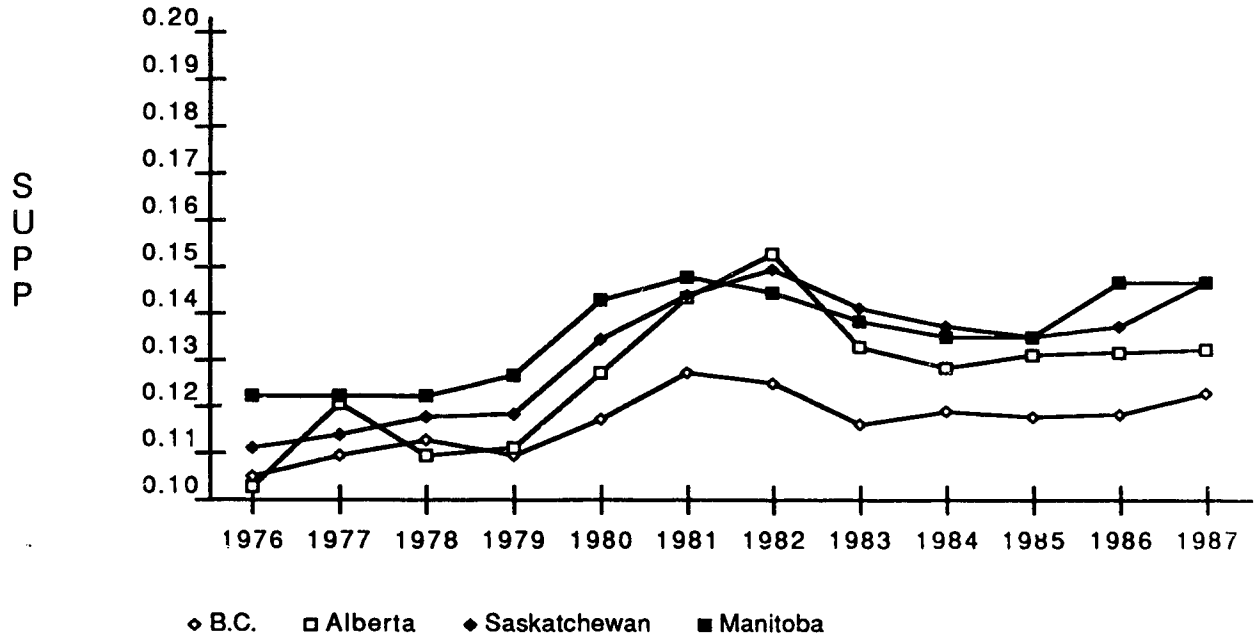

Figure 13: Changes in number of Staffing Units Per Pupil by province, 1976-1987.

SUPP in British Columbia rose 21.0% to the peak in 1981, declined following this, and rose again in 1987. From 1976 to 1987 SUPP increased 17.1% from 0.105 to 0.123, an average annual increase of 1.6%. As was the case with SU, the changes in Alberta were more extreme (see Figure 13). The peak in 1982 (0.153) was 48.5% higher than in 1976. A sharp decline in 1983 and 1984 was followed by a period of relative stability. Over the whole period SUPP increased 28.2% from 0.103 in 1976 to 0.132 in 1987, an average annual increase of 2.6%.

SUPP in Saskatchewan increased 35.1% from 1976 to the peak in 1982, closely associated with increases in funding. Three years of decline in SUPP (1983-85) accompanied the decrease in SU over that period. From 1976 to 1987 SUPP in Saskatchewan increased 32.4% from 0.111 to 0.147, an average annual increase of 2.9%. Manitoba had the highest SUPP in 1976 (0.122) and this increased 21.3% to 0.148 in 1981. Following a period of decline and recovery from 1982 to 1987, SUPP rose to almost the same level (0.147) as in 1981, a 20.5% increase over the whole period, an average annual increase of 1.9%.

The use of SUPP enables an inter-provincial comparison to be made of levels of service. Figure 13 shows that British Columbia ranked last over almost the entire period, and that (with the smallest

increase over the period) was falling further behind. Manitoba had the highest SUPP in 1976 and at the end of the period, although Saskatchewan's greater increase (32.4% compared with 20.5% in Manitoba) brought up SUPP there to the same level as Manitoba's (0.147) by 1987. Alberta's SUPP fluctuated most erratically, from last place in 1976 to first in 1982, and finally to third in 1987. The percentage increase in Alberta (28.2%), however, was greater than in Manitoba (20.5%). Possible reasons for these differences will be discussed in Chapter 6.

Summary

This section presented the results of the macro-analysis. A significant positive correlation was found between Gross Domestic Product and provincial government expenditure on public school education in all four provinces. In current dollars, funding increased an average of 170.5% from 1976 to 1987, ranging from 202.2% in Alberta to 132.6% in British Columbia. In constant dollars, funding increased an average of 23.1% for the same period, ranging from 37.6% in Alberta to 5.9% in British Columbia. All provinces, however, experienced real decreases in funding in 1978-79 and at some time during the 1980s.

British Columbia experienced the largest and most frequent fluctuations in funding, with six increases and five decreases in the

eleven year period. Of these, four were greater than 5%, and can be considered major changes.

A comparison of funding levels with levels of service measured by Staffing Units and Staffing Units Per Pupil showed that increases in funding were generally but not always accompanied by increases in levels of service. All provinces recorded net increases in both measures over the period in spite of intervening fluctuations. Increases in SU ranged from 29.4% in Alberta to 5.1% in Manitoba. Increases in SUPP ranged from 32.4% in Saskatchewan to 17.1% in British Columbia. When levels of service in the provinces were compared, it was shown that Saskatchewan and Manitoba provided the highest levels of service as measured by SUPP.

Micro-analysis

Research Question 6

For the years identified above, what specific changes occurred in the level of educational services provided by British Columbia school districts as measured by SU and SUPP?

In the sample of twenty British Columbia school districts SU (and hence SUPP) were calculated using instructional rather than gross expenditure for reasons already given. Thus some differences

might have been expected from the figures reported for the macro-analysis.

Staffing Units. In fact, the patterns are not dissimilar. Figure 14 shows that SU increased slowly but steadily from an average of 413.8 per district in 1976 to 458.1 in 1981. From that year there was a sharp decline to an average of 394.4 SU per district in 1985, before an increase to 421.4 in 1987. Over the entire period SU increased only 1.8%. A comparison with Figure 12 shows the basically similar pattern evident when SU is calculated from gross provincial expenditure on educational and provincial (rather than district) Average Teacher Salary.

Staffing units per pupil. As may be seen in Figure 15, SUPP increased more sharply than SU from an average of 0.064 in 1986 to 0.079 in 1981. However, the sharp decline in SU observed from 1981 to 1985 was not nearly so apparent in SUPP which remained relatively stable, increasing to 0.079 again by 1987. There was an overall increase in SUPP of 23.9% over the period, part of a pattern comparable with that observed in the macro-analysis (see Figure 13).

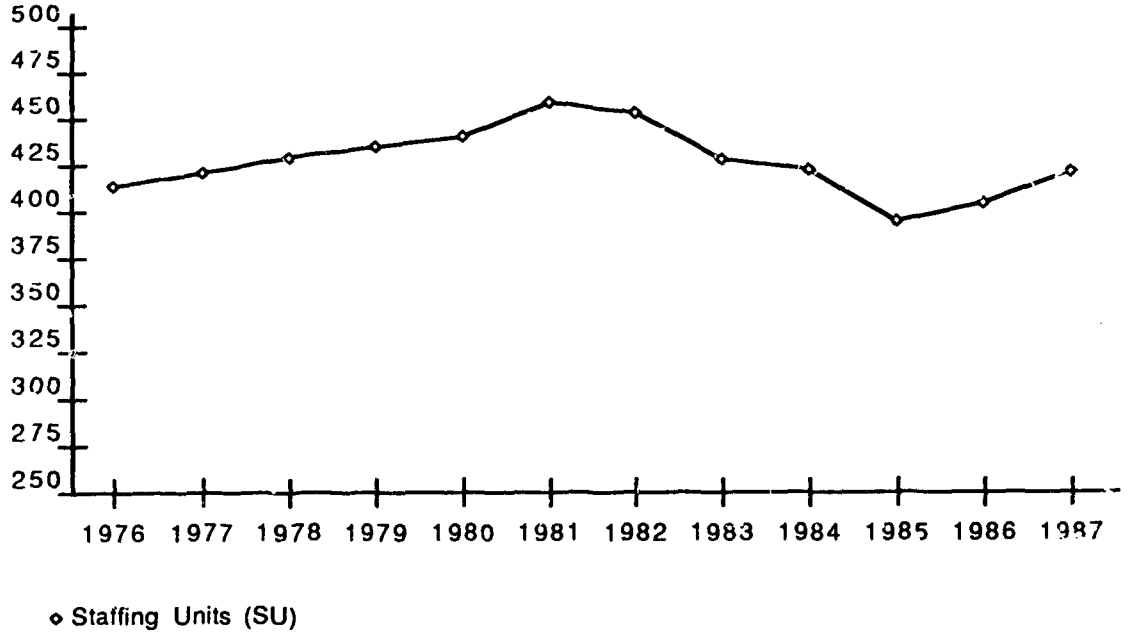

Figure 14: Average number of Staffing Units in a sample of British Columbia school districts, 1976-1987.

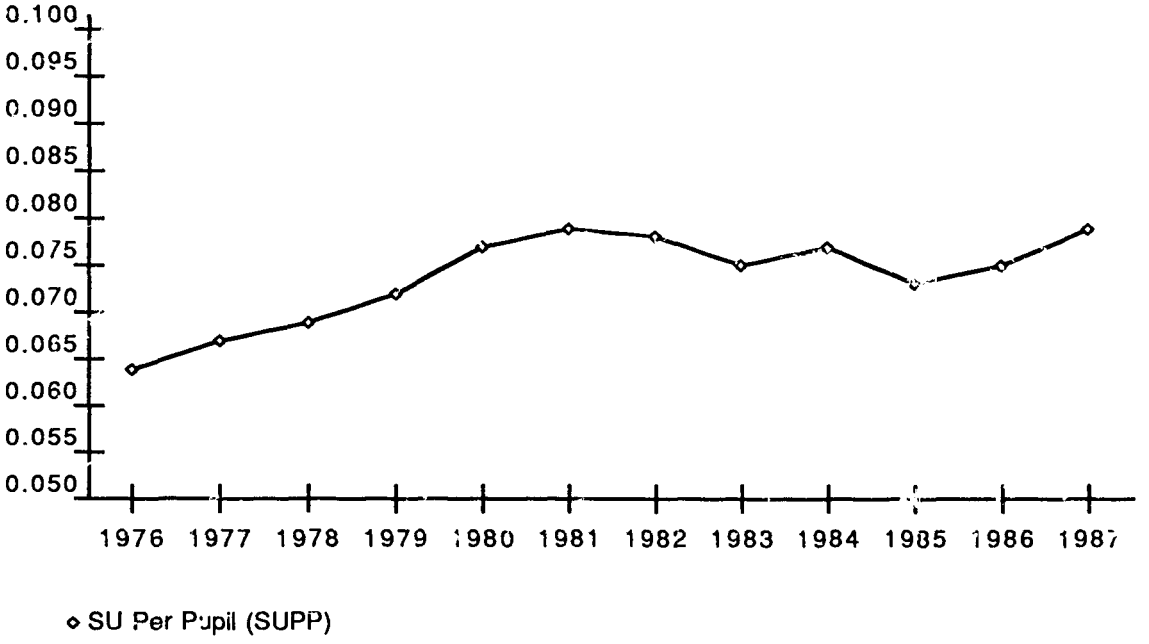

Figure 15: Average number of Staffing Units Per Pupil in a sample of British Columbia school districts, 1976-1987.

Research Question 7

For the years identified above, what specific changes occurred in the mix of educational services provided by British Columbia school districts in terms of changes in the proportions of school district personnel allocated to instructional, administrative, or support positions?

This section of the micro-analysis now moves from concern with levels of educational services provided (SU and SUPP) to the mix of services as measured by the percentage of Instructional Positions (%IP) or Staffing Mix Index (SMI). The periods identified in the macro-analysis as those of increases and decreases in gross expenditure form five alternating periods of increased and decreased funding. For each period a comparison was made between average %IP or SMI at the beginning and end of the period. This difference was tested for statistical significance using a *t* -Test, as was the annual difference between SMI in the base year and the sum of the base year plus mean annual increase. From 1976 to 1978 gross funding increased in British Columbia, and mean SMI declined 2.26% from 83.44% to 81.18%. This change was found to be statistically significant. ($p < .05$), as was the 1.11% mean annual decrease. The funding decrease from 1978 to 1979 was accompanied by an increase in SMI of 1.29%, which again was found to be significant ($p < .05$) (Table 7).

Table 7

Responses to Increases and Decreases in Funding, Measured by Gross and Average Changes in Percentage of Instructional Positions (SMI).

	1976-1978 Increase in Funding	1978-1979 Decrease in Funding	1979-1982 Increase in Funding	1982-1986 Decrease in Funding	1986-1987 Increase in Funding
Gross %ΔIP	-2.26* (5.63)	1.29* (4.67)	1.71* (2.26)	3.56* (4.22)	-0.29 (2.00)
Average %ΔIP	-1.11* (5.53)	1.29* (4.67)	0.58* (2.31)	0.88* (4.12)	-0.29 (2.00)

Note: *t* statistics in parenthesis
* $p < .05$.

From 1979 to 1982 the funding increase was associated not with a decrease in SMI as occurred in 1976 to 1978 but with a gross increase in SMI of 1.71%, a mean annual increase of 0.58%. Both these figures were found to be significant ($p < .05$). The four year period of funding decrease from 1982 to 1986 was associated with a 3.56% increase in SMI, an annual increase of 0.88%. Again both these figures were found to be statistically significant ($p < .05$). The increase in funding from 1986 to 1987 was accompanied by a 0.29% drop in SMI. This figure was not found to be statistically significant.

Research question 8

What relationship did these changes bear to characteristics of schools districts?

The hypotheses developed to answer the research question were tested using regression analysis. All the hypotheses were based on the presence of funding decreases, but the influence of the several factors identified as independent variables in the regression analysis were also tested in periods of funding increase. The dependent variables in the five regression equations were the mean annual changes in %IP (SMI) described in the previous section. As was noted, the first four of the five changes in SMI were statistically significant ($p < .05$). The regression results can be seen in Table 8. The amount of variation in SMI explained by the four (or in two cases, five) independent variables ranged from very little (about 15%) to very high (over 90%). The greatest proportion could be explained during the period of the decrease in funding from 1982 to 1986, and the least during the increase in funding from 1979 to 1982.

Table 8
Regression Results: Change in Percentage of Instructional Positions.

		District Characteristics					Summary Statistics		
	Constant	SP	$PP	DISP	SPED	STAT	R^2	Adj.R^2	F
1976-78 (Increase $)	21.348	-2.882a (-.72)	8.329c (.34)	.001 (.49)		-.270* (-3.21)	.474	.334	3.380*
1978-79 (Decrease $)	41.231	-4.44£a (-.85)	8.127c (.25)	4.631d (.14)		-.491* (-3.39)	.458	.313	3.165*
1979-82 (Increase $)	1.724	2.206a (.42)	-4.911a (-1.42)	-0.002 (-.61)		-7.277d (-.00)	.148	-.079	).650
1982-86 (Decrease $)	22.223	-2.078a (-.16)	2.186a (.73)	5.680d (.59)	.008 (.34)	-.255* (-14.64)	.942	.921	45.508*
1986-87 (Increase $)	-12.025	8.260a* (2.62)	9.547a (1.28)	-.006* (-2.46)	.001 (.45)	.121 (.83)	.394	.178	1.821
					T				
Pooled Decrease (n = 40)	25.158	-1.605a (-.65)	1.262a (.56)	-1.372c (-.08)	.652 (.13)	-.296* (-6.85)	.601	.542	10.231*
Pooled Increase (n = 60)	22.070	-1.339a (-.64)	2.965a (.02)	.044 (.85)	1.000* (4.87)	-.276* (-4.37)	.396	.340	7.086*

Source: Estimated from the equation $Y = b0 + b1SP + b2\$PP + b3DISP + b4STAT$ (or $b4T$) $+ b5STAT$ where Y = change in percentage of instructional positions. T = dummy variable for Time. See Table 3 for definition of other variables.

Note: a = x 10^{-5}; c = x 10^{-6}; d = x 10^{-4}; t statistics in parentheses; * = significant at .05 level.

To clarify the question of anticipated signs in the next section, an increase in SMI signifies an increase in the percentage of instructional positions, and a corresponding decrease in the percentage of administrative and support positions. Thus the sign of the coefficient of an independent variable is important in determining the direction of the change, and hence in interpreting results.

H1: *When funding cuts occur, large school districts tend to favour instruction over administration more than small districts.*

In periods of funding decrease, results suggest that the larger the school district, the lower the Δ%IP, although estimated coefficients were not statistically significant. The hypothesis was therefore rejected.

In periods of funding increase, there is evidence that the larger the district, the greater the Δ%IP (at least in the periods 1979-82 and 1986-87), although results were statistically significant only in the latter period. This finding is consistent with that of Choy (1980b).

H2: *When funding cuts occur, wealthy schools districts tend to favour instruction over administration more than poorer districts.*

In periods of funding decrease, the sign on the coefficient of $PP supported the hypothesis under test although coefficients were not statistically significant. The hypothesis was therefore rejected. In periods of funding increase, the picture was mixed and results insignificant.

H3: *When funding cuts occur, school districts which spend a large percentage of instructional funds on Special Education tend to favour administration over instruction more than those which spend a small percentage.*

In the 1982-86 period of funding decrease, the sign was contrary to expectations and the coefficient on SPED was insignificant. Thus the hypothesis was rejected. In the 1986-87 period of funding increase, the result showed that the greater the percentage of funds dedicated to special education, the greater the change in %IP, although again the result was insignificant.

H4: *When funding cuts occur, school districts with a widely dispersed student population tendto favour administration over instruction more than school districts which are more compact or demographically concentrated.*

In the periods of funding decrease the sign was not as anticipated, and the coefficient for dispersion was insignificant. The hypothesis was therefore rejected. In periods of funding increase there is evidence of a significant effect in 1986-87, indicating that the less widely dispersed the student population, the lower the change in SMI. This is supported by the (insignificant) result for 1979-82.

H5: *When funding cuts occur, the tendency to preserve instruction will be greater, in districts where the prevailing percentage of instructional positions is low.*

In periods of funding decrease, coefficients showed the expected sign and were highly significant. The hypothesis was therefore accepted. This result is consistent with Choy's (1980b) findings. In periods of funding increase the picture was less clear, although there was evidence of a significant relationship between STAT (the prevailing percentage of instructional positions) and SMI in the period 1976-1978.

Regression analysis was also employed to examine the effects of the independent variables om SMI in the combined periods of funding decrease (n = 40) and funding increase (n = 60). A dummy variable (T) was inserted to take into account the time factor. In both cases the coefficient of the variable representing the prevailing persentage

of instructional positions (STAT) was found to be highly significant ($p < .001$)

Summary

Examination of a stratified random sample of 20 British Columbia school districts from 1976 to 1987 revealed that changes in levels of service measured by SU and SUPP generally varied with funding levels in a similar fashion to that observed in the macro-analysis. Although level of service measured by SU in 1987 was very close to the figure for 1976, SUPP increased by nearly 24% over the period, demonstrating an increased level of service on a per pupil basis.

A *t* -Test was used to determine the significance of changes in the average percentage of instructional positions in the alternating periods of funding increases and decreases. In four of the five periods, both gross and average annual changes were found to be significant, if not numerically great. Both periods of funding decreases were associated with significant increases in SMI. Two of the three periods of funding increase were asssociated with decreases in SMI, while the third showed a small but significant increase.

To explain the variation between different responses to funding changes at the district level five independent variables were

identified: enrolment size, district wealth, proportion of funds spent on special education, student dispersion, and the percentage of instructional positions at the base year of each period. Regression analysis revealed that while these were able to explain up to 94% of the variation, it was necessary to reject all the hypotheses except H_5, which was accepted. During periods of funding decrease it appears that districts with a lower percentage of instructional positions had a greater tendency to increase this percentage. This is consistent with Choy's (1980b) finding.

There is some evidence that district size played a role in increasing SMI especially in 1986-87. There is also evidence to suggest that the lower the prevailing %IP, the greater the tendency to favour instruction in periods of funding increase (especially 1976-1978) as well as of funding decrease. Moreover, it appears that in 1986-1987 there is evidence that the less widely dispersed the student population, the lower the change in SMI. Conclusions should be regarded with some caution, given that the tests of each individual period were based on a sample of only 20.

Chapter 6

Discussion

Macro-analysis

Gross Domestic Product and funding levels.

The high positive correlation between GDP and funding levels shown by the results of the macro-analysis contrasts sharply with the relationship between funding levels and enrolment. With the exception of Alberta, all the provinces showed a strong negative correlation between the latter two variables (Table 9).

Table 9

Pearson Correlation Coefficients between Provincial Government Expenditure on Education and FTE Enrolment.

British Columbia	-.954*
Alberta	.747•
Saskatchewan	-.846*
Manitoba	-.864*

* $p < .001$, • $p < .005$

The difference evident between these findings and the high positive correlation found between GDP and education funding, suggests that in three of the four provinces funding levels were more closely related to the state of the provincial economy than to enrolment. The reasons

for the difference in Alberta is probably attributable to: (a) a funding formula more closely tied to enrolment, (b) the use of the Heritage Fund accumulated from the profits of the petroleum industry for both capital and operating educational expenditures; and, (c) provincial school enrolment patterns. In Alberta, enrolment increased marginally (0.8%) from 1976 to 1987; in the other provinces it decreased quite considerably (8.5% in Saskatchewan, 9.5% in British Columbia, and 12.7% in Manitoba).

Reasons are suggested by Cibulka (1987) who examined various budgeting theories and their relevance to the management of organizations in a state of decline. Rational budgeting should involve 'systematic procedures guaranteeing that policy will not respond to short-term pressures, but rather will reflect reasoned consideration of optimal choices' (p.12). He lists nine factors which should indicate the presence of rational budgeting, including linking budget planning to multi-year goal settings, a budget analysis procedure, and the use of management information systems. Rational budgeting, he suggests, should also provide evidence of 'efficient expenditure management. An optimal policy would be one that showed expenditure reductions roughly commensurate with enrolment loss, accomplished in a timely manner' (p.13). In his study of major school systems in the United States he found little evidence of either measure of rational budgeting.

On the contrary, he pointed out that New York school system policies 'explicitly prohibited the linking of program evaluation and operations analysis with budget preparation and approval' (p.15).

He also noted an average time lag of 7.2 years from the first year of enrolment drop to aggregate expenditure decline, and suggested that even then the expenditure cuts were hardly rationally arrived at, but were primarily the result of a local financial crisis. Although he is describing school systems by cities, these are similar in enrolment size to Canadian provinces, and thus a comparison is legitimate.

Having also discounted incremental budget theory and public choice theory to explain this situation, he suggests that alternate rational belief systems should be taken into account. These include not only technical or functional rationality but also substantive rationality; the former can be understood as 'primarily a *process* to be undertaken' (p.29), while the latter is 'the pursuit of proper organizational ends' (p.29). In addition he suggests that employee justice, 'the pursuit of fair working conditions and wages as organizational employees perceive them to be' (p.30), should be considered 'rational.' While all three belief systems are rational, in the sense defined, they are often in conflict with one another, and hence could be considered irrational by other criteria.

If Cibulka's suggestions are applied to this study, one can conclude that in the period of declining enrolment (in British Columbia, Saskatchewan and Manitoba at least) technical or functional rationality was at odds with substantive rationality. The technically rational belief that enrolment decline should mean a decline in costs was in opposition to the substantive rationality concerned with providing the 'best' education for students. Conventional wisdom and common sense, if not empirical evidence, claim that lower pupil-teacher ratios and smaller classes are desirable. Lower enrolment figures combined with the same (or a greater) number of teachers can clearly provide these, and hence a substantive rationality can be gained at the expense of purely functional rationality.

There is also an aspect of substantive rationality which Hartman has described as the 'belief in the cost/quality relationship (or myth) that is thought to exist in education' (1988:437). In simple terms, you get what you pay for: any decrease in funding is bound to be associated with lower standards. This belief is clearly opposed to the technically rational policy of cost cutting.

Technical or functional rationality was also at odds with Cibulka's employee justice system of belief in rationality. Teachers' legitimate concerns with job security and salaries in a time of high unemployment and rampant inflation, backed by strong and vocal

support from unions and associations, put pressure on provincial governments to increase, or at least maintain, funding levels. These demands were most often articulated in association with the substantive rationality belief in 'best professional practice' (Glegg, 1990).

Finally, the close relationship between GDP and funding levels suggests that there is a rough consensus about how much 'ought' to be spent on education. In economic terms, the evidence of stability suggests that the supply of funding for educational services is highly inelastic. Naturally, advocates for education, as for other areas such as health care, would like to see funding increased, but the actual percentage of government revenue allocated to education does not vary greatly from year to year. The addition or removal of a few million dollars, although newsworthy, makes only a marginal difference to the total budget, which in the provinces studied runs into billions of dollars. Berne (1988) has pointed out that total education expenditure in the United States (public, private, primary and secondary) as a percentage of Gross National Product increased from 3.4% in 1959 to 4.7% in 1970, remained relatively constant until 1975, declined over several years, then stayed at about 4% from 1978 to 1985. Taken merely as a part of the overall economic picture, educational expenditures generally remain constant.

There is an apparent link to be seen here between Cibulka's rationalities and Hodgkinson's (1978, 1983) value paradigm. Hodgkinson postulates a hierarchical view of commitment to values, briefly defined (after Kohlberg) as concepts of the desirable which influence choice. Type III commitment, the lowest level, is basically affective, and involves simple preference in the choice between alternatives. This level need not concern us here as much as the rational and cognitive Type II commitment, which Hodgkinson subdivides into IIa (consequence) and IIb (consensus) and Type I, which subsuming the other levels, moves into the realm of principle and the will.

Examples of the various steps in the value paradigm can be seen in the previous discussion of the different rationalities involved in the debate over funding levels. The Type IIb consensus on what 'ought' to be spent on education can in theory be subordinated by the Type IIa commitment to a particular course of action based on rational consideration of the consequences. In practice, however, the political character of the decision tends to maintain commitment at the lower level, corresponding to Cibulka's substantive rationality.

The problem here is, of course, that a conflict has been suggested between Cibulka's rationalities, but it should be remembered that he refers to them as alternate rational belief

systems. The use of the word 'belief' pushes the commitment to a specific decision or course of action out of Hodgkinson's Type IIa category and into Type I. It is quite possible (in theory) to discuss school funding in a rational way, and to assess the relative worth of consequential arguments for tying funding to enrolment decline, providing the best education for students, or ensuring good salaries and working conditions for staff. What happens in practice, however, is somewhat different. Rational belief systems, whether they are categorized as technical, substantive or employee justice, are elevated to the Type I level, where value conflict is most irreconcilable. Government economists, in the role of Schick's (1988) 'conservers', support a technically rational approach, education advocates put forward their own substantively rational arguments, and teachers' groups promote their particular rational view of employee justice. All groups see their own point of view as rational, but that of others as unreasonable and irrational. In Hodginkson's terms, each group assesses its own position as Type IIa, and thus eminently reasonable to any thinking person. Opponents, then, are by definition not 'thinking', but clinging to a trans-rational (if not irrational) Type I position. The Type IIa 'rational belief systems' have become Type I rationalized beliefs.

The data presented in this study suggest that at least three of the four provincial governments studied were influenced in the 1970s

more by substantive and employee justice beliefs in rationality and by consensus, than by the politically unpopular functional rationality of reducing expenditure to match enrolment decline.

A notable exception to this in the early 1980s was British Columbia. Economic necessity, in conjunction with the political philosophy of a party which emphasized a fiscally responsible free enterprise approach to spending, persuaded (or emboldened) the provincial government to introduce strict controls over public sector spending. Post-secondary education and, to a lesser extent, health care were among the hardest hit. Public schooling, which the provincial government has a statutory responsibility to provide, was also affected, with the specifically stated target of reducing service levels to those which existed in 1976. A funding formula (the Fiscal Framework) was put in place, establishing service levels acceptable to the Ministry of Education and tying funding directly to enrolment and the costs of providing schooling. These costs consist largely of teachers' salaries which, along with those of all other public sector employees, were subject to strict controls by the government appointed Compensation Stabilization Commissioner.

This approach not unexpectedly generated considerable opposition (Glegg, 1990). If a government has a Type I commitment to a certain course of action, though, it often has the power to impose its

own values. Some critics insisted this was the course followed in British Columbia. Nevertheless, the subsequent re-election of the Social Credit Party, which ran on its record of a tough, realistic and business-like approach to economic recession, indicated that a majority of citizens were prepared to accept belt-tightening or, from the opposition's point of view, slashing of funding for social services. It is interesting to note here an example of the time-lag between the onset of enrolment decline and the imposition of funding cuts observed by Cibulka (1987) in the United States. Enrolment peaked in 1976 in British Columbia, but it was not until 1982, six years later, that any specific action was taken to curb rising costs or hold the line on expenditures. In addition, Cibulka's suggestion that in the school systems he studied action was eventually taken largely in response to market pressures appears relevant to the situation in British Columbia. Finally it should be noted that the 1988 Royal Commission on Education in British Columbia recommended a change to a block funding mechanism to determine funding levels for public school education:

> A block of funds is allocated to the program are [sic] increased annually according to the capacity of the government to support public spending. For example, funding per pupil could be set in year one and indexed thereafter to the growth of the economy or government revenue. (British Columbia Royal Commission on Education, 1988:168).

This seems to imply some linkage of spending levels to enrolment, but more importantly stresses that funding should be specifically tied to

the state of the provincial economy. As this study has shown, the latter already appears to be the case.

Fluctuations in funding levels

As the results reported in Chapter 5 demonstrate, British Columbia experienced the most frequent and the greatest fluctuations in funding levels (see Tables 5 and 6). The eleven annual periods covered in this study included six increases and five decreases in funding measured in constant dollars, and four of these involved changes of more than 5%. Funding rose from 1976-78, 1979-1982 and 1986-87, and declined from 1978-79 and 1982-86, giving five alternating periods of growth and decline.

The reasons for these changes can be inferred from the previous discussion. Economic conditions, as demonstrated, do apparently influence funding levels, and British Columbia's economy, with its reliance on primary and resource industries, responded more quickly and perhaps more sharply to global and particularly North American trends.

In addition, British Columbia was the only province studied to take direct and specific action to curb the increases in spending on education and to tie funding to enrolment while controlling costs in the form of salaries. It should not be overlooked, however, that

funding *increases* are also associated with salaries. Major salary increases, such as those reported in all four provinces in 1982 or 1983 (see Figure 5), drove up costs almost immediately, reflecting the labour-intensive nature of schooling.

These fluctuations have a negative effect not so much on account of their size, although this is important, but because of the climate of uncertainty that accompanies them. This point is well made in the Commissioned Paper on finance prepared by researchers for the 1988 Royal Commission on Education in British Columbia, and repeated verbatim in the actual report of the Commissioner:

> Since the beginning of the 1980s funding for schools has been through a cycle of rapid expansion followed by rapid contraction followed by another period of expansion. The education system cannot absorb these ups and downs in the same way as other segments of our economy because the public expects the standard of service to be maintained at a reasonable level. . .The education system has had to struggle to adjust to changing resources over the past few years but, equally as important, the system has had to cope with a situation where the "rules of the game" were constantly changing. (Cutt, McRae and Adams, 1988:25)

The uncertainty which accompanies fluctuations in funding can affect all aspects of education, but the impact is felt most strongly in two areas. Long range planning becomes difficult, if not impossible, as school district administrators pointed out most vociferously during the British Columbia restraint program. The imposition of percentage-

based cuts in the budgets submitted by school districts for approval in March 1982 was followed in July of the same year by a further reduction in funding (Fleming and Anderson, 1984). Not only had the 'rules of the game' changed, but also the size of the playing field. Perhaps, to alter the metaphor somewhat, one might say that the size of the rink had changed, and that (*pace* Lewin) the ice surface did not have the time to refreeze properly before it was again unfrozen.

The second area most affected by the uncertainty engendered by fluctuations in funding is the more nebulous one of teacher morale. From 1976 to 1982, when a considerable number of teaching jobs were available, teachers' salaries increased rapidly, (at least in current dollars), job security was reasonably high, ample opportunity existed for promotion, and an increasing pool of support personnel was available to teachers. With the economic recession in British Columbia, and the advent of the restraint program, the situation altered dramatically: school districts were not hiring new staff, existing staff were faced with lay-offs, salary increases were virtually non-existent, promotion prospects were severely limited, and school -based support personnel were among the first to be eliminated because of reduced funding. Add to these factors the political confrontations, work-to-rule campaigns, teacher walk-outs and the general dissatisfaction and unrest associated with economic recession, and one may speculate that teacher morale was at a low ebb. The

inability to look and plan ahead, either at the nomothetic or idiographic level, became a consequence of unpredictable funding changes.

This discussion has suggested that the uncertainty which accompanies large, rapid and unanticipated fluctuations in funding for education has more potential for harm than the actual changes themselves. Pilot research for this study (Glegg, 1988) produced some preliminary evidence of a link between changes in funding levels and the numbers of high school graduates and drop-outs, a topic which could well prove fruitful for future research.

Staffing Units and funding changes

The relationship between fluctuations in funding and the level of educational services provided is of central importance to this study. Chapter 5 showed that the number of Staffing Units (SU) generally tended to move in the same direction as funding; that is to say that levels of service varied directly with the amount of money spent by governments on education.

This is especially true of the early years of the period studied. From 1976 to 1978 or 1979 changes in service levels measured by percentage changes in SU were very similar to percentage changes in expenditure, either upwards or downwards. From 1978/79 to

1981/82 SU moved in the same direction as funding, but was not so closely correlated. After this time, however, the pattern became less clear and much more erratic. The key factor appears to be the major increases in teachers' salaries in 1982/83, as might be expected when it is remembered that SU are calculated by dividing expenditure by Average Teachers' Salaries (ATS). When salaries were more stable from 1976 to 1982, the relationship between SU and expenditure was reasonably strong. The increases in ATS of around 20% in 1982 and 1983 appeared to throw the relationship out of equilibrium, and this was not fully regained by the end of the period studied. It appears then that in periods of relatively stable funding and salary levels that SU and expenditure are quite closely associated. When the stability is disturbed by major variations in salaries and/or expenditure, the relationship is much less apparent.

Although SU were intended to act primarily as an index of levels of service provided, they also serve as an indicator of the type (or mix) of service. By comparing SU to the actual number of teachers it is possible to get a measure of the amount of funding applied directly to instruction as defined by teachers' salaries. To put the matter in the simplest terms, if all educational funding went to teachers' salaries, then SU would equal the number of FTE teachers employed; the ratio would be 1:1. The difference between this theoretical number of teachers (i.e. SU) and the actual number of teachers gives an indicator

of the mix of services provided. Another way of stating this is to note that the calculation of actual expenditure on teachers' salaries (ATS x FTE teachers) as a percentage of the total expenditure gives the same result as FTE teachers divided by SU.

An examination of the results of such calculations allows some interesting inter-provincial comparisons to be made. In 1976 the number of FTE teachers as a percentage of SU was approximately 48.5% in British Columbia and Alberta, 45.3% in Saskatchewan and 43.1% in Manitoba. These figures thus represent the proportion of gross expenditure devoted to the actual employment of teachers. The remaining amount represents the proportion of gross expenditure spent on all other aspects of public school education, including major cost factors such as capital funds and ministerial and administrative expenses.

As Figure 16 shows, all provinces spent proportionately less on teachers' salaries in 1987 than they did in 1976. It also shows that Alberta, Saskatchewan and Manitoba spent the smallest proportion in either 1981 or 1982, after a period of growth in expenditure and just before the major increase in ATS noted above. In 1982 Alberta spent only 35.8% of its total expenditures on teachers' salaries, the lowest level recorded and nearly 13% less than was spent in 1976. British Columbia and Manitoba had the smallest fluctuations (approximately

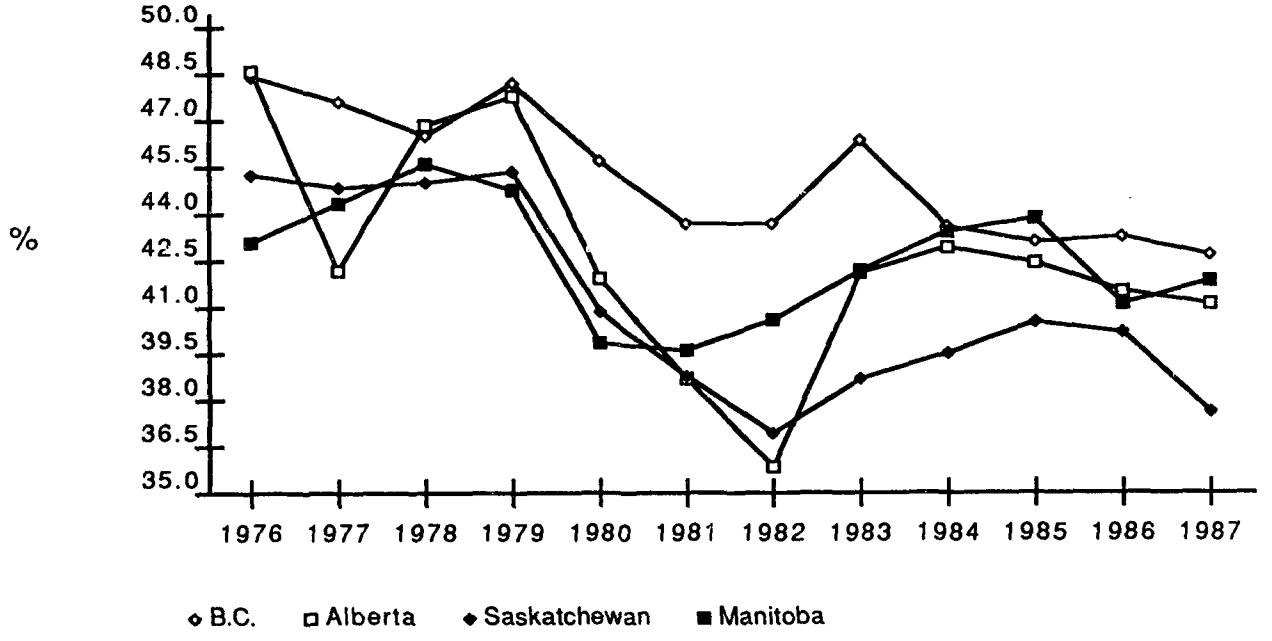

Figure 16: FTE Teachers as a Percentage of Staffing Units by Province, 1976 - 1987.

Note: Percentages calculated from Statistics Canada data.

6% over the period) while Saskatchewan experienced a variation of approximately 8.5%.

Various interpretations can be drawn from these data which support the idea that administrative and managerial components of a bureaucratic system tend to expand disproportionately. This conclusion should be only viewed as tentative, however, as there are other factors involved, such as variations in major capital expenditures. It should also be re- emphasized that in the macro-analysis SU are defined as Gross Expenditure divided by ATS. The more usually cited figure of about 80% of education costs being devoted to salaries can be obtained by calculating SU from Instructional Expenditure divided by ATS. This was done in the micro-analysis, but proved unreliable at the inter- provincial level because Instructional Expenditure may not be defined in the same way in different provinces.

Other conclusions to be drawn from the data suggest a measure of efficiency, if this is defined as the amount of funding actually assigned to classroom instruction as opposed to all other areas of expenditure. By this criterion, British Columbia appears to do better than other provinces studied. This is in contrast to the other measures of levels of service described earlier, such as total expenditure and numbers of teachers, where British Columbia did not seem to fare so well. Over almost the entire period British Columbia

recorded the highest rating of FTE teachers as a percentage of SU, indicating a higher proportion of total expenditure devoted to teachers' salaries and thus to classroom instruction. Whether this is to be seen as an indication of (a) a tight, efficient system, (b) under-funding of support and capital services, (c) a militant and vocal teachers' federation, or (d) a combination of these, is a matter for conjecture. Probably elements of all factors are present, which returns us to the realm of value conflict.

Staffing Units Per Pupil and funding changes

As SUPP are derived from SU and enrolment, much of the above discussion is relevant to both indices of levels of service. As might be expected, on only three of 44 observations did SUPP move in the opposite direction to SU (British Columbia: 1985-86; Saskatchewan: 1978-79; Manitoba: 1986-87; see Table 6). The suggestion made earlier that similar increases and decreases in SU and in funding are more likely to be present in a relatively stable environment is also applicable to the relationship between SUPP and funding.

The inclusion of enrolment as a factor to be considered permits an inter-provincial comparison to be made, and, as was noted in Chapter 5, British Columbia and Alberta (with the exception of a brief surge in 1982) generally provided lower levels of service than Saskatchewan or Manitoba. Predictably, SUPP tend to vary indirectly

with Pupil Teacher Ratios (PTR), but the changes are larger as SU represent a theoretical number of teachers, generally about twice as great as the actual number, as shown in the previous section.

SU and SUPP as indices of levels of service

The conventional indicators of levels of service fall into two categories. First, there are indicators which rely mainly on financial data. Total expenditure and instructional expenditure can be used either as gross measures or expressed on a per pupil basis. A more sophisticated figure can be obtained by using some kind of weighting formula to adjust for differences between groups of students or even individuals. These financial indicators are easily understood measures which can be of value in longitudinal studies, but are of strictly limited use in cross-sectional analysis comparing jurisdictions unless an equalization formula is introduced to compensate for such things as differences in teachers' salaries. They are, however, frequently used as a measure of quality in support of demands for increased expenditure by those who claim underfunding by superficial comparison with others. This point is addressed by Skolnik (1986) who notes that although it 'costs' nearly 40% more to provide university education in Alberta than in Ontario, 'there is no widely held popular impression in the higher education community that the quality of universities in Alberta is substantially greater than in Ontario (or the reverse either)' (p.440). He further claims that 'inter-

jurisdictional comparison of data provides little [more] than rhetoric, reflecting primarily differences among jurisdictions of prosperity, priorities and politics' (p.441).

The second category of conventional indicators ignores financial aspects and concentrates on personnel by using either PTR or Average Class Size. While these measures are probably better than expenditure rates for inter-jurisdictional comparisons, they tend to have inherent weaknesses. Unless it is made quite clear what definition of 'teacher' is used there is likely to be misinterpretation. If all certified teachers (including principals, administrators and support staff such as counsellors) are taken into account, as is usually the case, then PTR is likely to be considerably smaller than Average Class Size (ACS), which is a much more visible measure. While ACS is on the surface a readily understandable indicator of level of service, it also has limitations as it too implies a sometimes misleading qualitative function. An 'average' class of, for instance, 25 students would be impossibly large for some special needs students, and unrealistically small for a senior high school band program. There is also no account taken of such important factors as school size: it does not take a statistician to see that a small school in an isolated area is likely to have smaller classes than a large city school. Thus the conventional indicators of levels of educational service rely either on financial data (perhaps related to enrolment) or on some ratio of students to teachers.

In contrast to the two categories described above, a third category can resolve many of the problems. Staffing Units and Staffing Units Per Pupil, the indices developed for this study, utilize elements of both by taking into account expenditure, teachers' salaries and enrolment. The one feature missing (the actual number of teachers) can be usefully included in a comparison to SU as was shown earlier. Skolnik's previously discussed article on the problems of research on the effects of financial restraint, suggests that 'if one could establish some correlation between inter-jurisdictional differences in funding and differences in quality, effectiveness or outcomes, then the inter-jurisdictional funding differences would have more significance' (1986:441). While it would be presumptuous to suggest that SU and SUPP do provide this correlation, they at least appear to represent a step in the right direction.

Micro-Analysis

Funding changes and levels of service

Staffing Units. Changes in SU in the sample are quite similar to those found in the macro-analysis, and basically follow a pattern comparable to that of the funding changes. The decrease in funding in 1979 was not accompanied by decrease in SU, and SU begun to increase again in 1985, somewhat earlier than funding levels. Apart from these variations, however, there is a strong similarity in patterns of increase and decrease. The results reported in Chapter 5 showed

that levels of service as measured by Staffing Units rose slightly from 1976 to 1981, then declined sharply until 1985. As was suggested in the discussion of the macro-analysis, the decline can probably be explained as a consequence of a combination of increases in teachers' salaries and a decrease in funding levels. By 1981, however, SU had climbed back to a level just 1.83% higher than in 1976. Thus, if SU is used as a measure of service level, it appears that the British Columbia government's announced 1982 goal of returning service levels to those of 1976 had been achieved.

Staffing Units per pupil. The change in SUPP, however, although tending to follow the basic funding changes, does not indicate a return to 1976 service levels. In fact there was an increase of nearly 24% over the period. This is presumably a consequence of the decline in enrolment which moderated the effects of both salary increases and funding decreases. Therefore, if we use SUPP as an indicator of level of service we can conclude that students in British Columbia were as well served in 1987 as they were in 1981, the high point just before the restraint program.

Funding changes and mix of services

As had been anticipated from the examination of previous research there was generally a tendency for SMI, the percentage of instructional positions, to increase during periods of funding cuts, and

to decline during periods of funding increases. During both periods of funding decrease (1978-1979, and 1982-1986) there were significant increases in SMI, suggesting that in times of financial restraint instructional services tend to be preserved at the expense of administrative and support services. The annual changes, however, were not very great (1976-1978: 1.29%; 1982-1986: 0.88%). Choy (1979) suggested that a deviation of less than 1% from zero percent change is a conservative definition of equal cuts in instructional and administrative and support staff. The present study, however, enables the pattern to be observed over a longer period, and the 3.56% increase in SMI over three years is certainly large enough to indicate deliberate policy in addition to statistical significance.

The changes in SMI during the periods of funding increases are not as consistent as during funding decreases. The first and last periods (1976-1978 and 1986-1987) did follow the expected pattern with small decreases. It should, perhaps, be emphasized again that a decrease in SMI does not necessarily represent an actual loss of instructional positions but merely a drop in the proportion of certified teachers employed in instructional positions, with a corresponding increase in the proportion of those in administrative and support positions.

The significant total decrease of 2.26% in the percentage of

instructional positions from 1976 to 1978 had the highest annual rate (1.11%) of any of the periods of funding increase. The small decrease in 1986 to 1987 was the only change not to be significant at the .05 level. It did, however, come very close ($p = 0.06$).

The one period when increases in funding were matched by increases in SMI was 1979 to 1982. It is suggested that this can be explained by the very small average annual change (0.58%) which is probably indicative of a static response, and supports Choy's (1980a) finding that the mix of services holds to the post-cut configuration rather than returning to the pre-cut pattern.

The changes in SMI, therefore, generally indicate that: (1) the proportion of instructional positions tends to increase when funding is cut, and thus (2) the proportion of administrative and support positions tends to decrease. This is presumably because the loss of non-instructional positions is seen as less harmful, and certainly easier to justify to parents and taxpayers than the loss of classroom positions. It should be noted here that teachers in non-instructional positions are likely to have more seniority, and thus are likely to be in a position to return to the classroom if they so wish. The changes also indicate that, following a funding cut, the mix of services remains closer to the post-cut than pre-cut configuration. It seems harder to unfreeze the mix of services following a funding cut.

Variations in responses to funding change

The results of attempts to identify characteristics of school districts which might influence responses to funding changes were largely quite inconclusive. It is possible, however, to draw some tentative conclusions which might assist future researchers. It should be remembered that the hypotheses all referred to responses to funding cuts. During the two periods when funding decreased, the signs associated with the coefficients of the variables were at least consistent, and this was not the case for periods of increased funding.

When funding decreased, there was a significant ($p < .05$) tendency for districts with a lower percentage of instructional positions to preserve instruction at the expense of administrative and support positions. This was consistent with what had been anticipated, but is in fact the only statistically significant result in the two periods of decreased funding. In 1978 to 1979 there was a significant correlation between the %IP at the base and enrolment, ($p = .025$), but this was not apparent during the second cut, and the STAT variable (reflecting the antecedent condition) is not significantly correlated with any of the others. As Hypothesis 2 suggested, there was some evidence that wealthy districts do have a greater tendency to favour instruction over administration but the results were not significant.

Neither enrolment (SP) nor dispersion (DISP) had a significant effect on the tendency to preserve instruction during periods of funding decrease, and in one case (SP) the signs of the coefficients were the opposite of what had been expected, providing tenuous evidence that widely dispersed districts with smaller enrolments favour instruction over administration when funding cuts occur.

It is noteworthy that the two variables representing dispersion (measured by number of students per square mile) and enrolment showed a strong positive correlation (P = .001). Concentrated urban districts tend to have a larger enrolment, and thus it is suggested that the dispersion variable should in future studies be replaced by one which is less strongly correlated with enrolment.

During the periods when funding increased it is more difficult to draw even tentative conclusions from the regression results, as SMI did not vary consistently. In 1976-78 the antecedent condition (STAT) had a significant effect on SMI, and in 1986-87 there was evidence that both enrolment and dispersion factors contributed to an increase in SMI, although the change in SMI was not itself statistically significant. The first and last periods of increase were associated with a decline in the percentage of instructional positions, but during the second period of increased funding (1979 to 1982) SMI increased slightly. The signs of some of the coefficients are not consistent even

in the two periods of funding increase associated with declines in SMI. It can only be tentatively suggested, as Choy found (1980b), that following a funding cut the tendency to refreeze in a post-cut configuration is stronger than the tendency to return to the pre-cut configuration, even when funding increases again. Perhaps this is another indicator of the tendency of the system to resist change.

One other factor emerging from this analysis is of interest. The removal of non-residential property from the locally available tax base in 1982 altered the ranking of rich and poor districts. The argument for the province-wide collection and redistribution of non-residential tax was based on the premise that it would be more equitable, and would lower average residential taxes. Those districts which had been able to call on major industrial installations for tax money had been comparatively wealthy, but as such industries (e.g. mining) are more likely to be located in isolated and geographically remote areas, it was the smaller more dispersed school districts which were most affected. This is illustrated in the fact that after 1982 a strong positive correlation ($p < .05$) existed between enrolment and district wealth, reflecting the increased importance of residential property as an available taxation base. Prior to 1982, the correlation (although statistically insignificant) was negative.

Finally, the introduction of the Fiscal Framework and controls on

spending in 1982 appeared to have one additional effect, as after that time a negative correlation ($p < .05$) existed between student population and the amount spent on Special Education. Smaller districts spent proportionately more on Special Education, presumably because the Fiscal Framework included First Nation schooling in Function 3, the Special Education category, and there tends to be a much higher proportion of native Indian students in small, rural school districts.

Chapter 7

Summary, Conclusions and Recommendations

Summary

Background and context of the study

The literature and research reviewed indicated that organizational change, particularly with reference to education, had until recently been primarily considered in terms of growth and innovation. Economic recession and its associated political factors, coupled with the previously unobserved phenomenon of declining enrolment, made it necessary for organizational theorists and educational administrators to come to terms with retrenchment. While numerous and largely unsuccessful attempts have been made to demonstrate the relationship between resources for education and such qualitative outcomes as student achievement, comparatively little attention has been paid to the changes in organizational domain resulting from decreases, or even increases, in funding.

From 1976 to 1987 the four Western Canadian provinces experienced different patterns of economic growth, levels of funding and enrolment. This set of circumstances appeared to provide a suitable background for the study of the effects of changes in funding on the provision of educational services.

Methodology

The study was divided into a macro-analysis and a micro-analysis. The macro-analysis used data compiled from Statistics Canada sources to examine the relationship between Gross Domestic Product and expenditure on public school education in British Columbia, Alberta, Saskatchewan and Manitoba between 1976 and 1987. Pearson Product Moment Correlation Coefficients were used to assess the strength of the relationship. The data were also examined to determine the frequency and magnitude of changes in funding levels. Two indicators of level of educational service were developed for the study, Staffing Units (SU) and Staffing Units Per Pupil (SUPP). These were examined in relation to funding changes to give an indication of the effect of funding changes on the level of educational services provided by the provinces, and to enable comparisons to be made between them.

From pilot research (which was confirmed by the macro-analysis) British Columbia was identified as the province which experienced the largest and most frequent fluctuations in funding. A stratified random sample of twenty British Columbia school districts provided the subject for the micro-analysis. Data were obtained from British Columbia Ministry of Education sources.

The micro-analysis examined the effect of funding changes on

the indicators of levels of service (SU and SUPP) used in the macro-analysis. The analysis also examined changes in the mix of services provided by the school districts. The Service Mix Index (SMI) was developed and reflected the percentage of certified teaching personnel employed by school districts in instructional, rather than administrative or support positions. Statistical analysis involving a *t* -Test was used to determine whether there were significant differences in the mix of services measured by SMI during periods of increased and decreased funding.

Finally, five variables were identified which might be supposed to influence different responses by school districts to changes in funding. Regression analysis was used to test the hypotheses developed to determine the impact of the variables.

Macro-Analysis results

In all four provinces a highly significant positive correlation was found between GDP and gross provincial government expenditure on public school education. A significant positive correlation was also found when the provinces were considered together. Expenditure was more closely associated with the state of the provincial economy than with enrolment, which declined considerably in all provinces except Alberta.

In current dollars, all provinces experienced considerable increases in expenditure, but increases in constant dollars showed large inter-provincial differences. Alberta increased funding by over 35% in real terms, and Saskatchewan and Manitoba by approximately 25%, while the increase in British Columbia was less than 6%. All provinces experienced a net drop in real terms in 1978 and/or 1979, and some slowdown or decline in the 1980s: funding levels in British Columbia declined for four years (1982-1986) before rising again in 1987, Saskatchewan's funding declined slightly in 1985 and Alberta and Manitoba both experienced a drop in 1987.

British Columbia, with six increases and five decreases, experienced the most frequent changes in funding levels. None of the other provinces had more than three years in which funding decreased. The largest average annual changes, regardless of sign, were found in Alberta (6.2%) but most of these changes were increases. Both British Columbia and Alberta experienced four changes of more than 5% in real terms, while Manitoba had two and Saskatchewan only one.

Until the early 1980s levels of service measured by SU tended to fluctuate directly in association with funding levels, except in Manitoba. After that time, however, the pattern was not so clear. SU in all four provinces increased to a peak in 1981 or 1982, declined for

several years, and then levelled off. Alberta experienced a net increase of nearly 30% in SU over the period, compared to 20.5% in Saskatchewan, 6.0% in British Columbia, and 5.9% in Manitoba. It was noted that although Manitoba had the smallest increase in SU, that province recorded the second largest increase in funding.
Staffing Units Per Pupil (SUPP) were found to be closely associated with SU, and thus reacted to funding changes in a similar manner. The largest fluctuations were seen in Alberta, where SUPP increased 28.2% over the period. The greatest increase in SUPP (32.4%) was observed in Saskatchewan, and the least in Manitoba (20.5%) and British Columbia (17.1%). An inter-provincial comparison identified British Columbia as consistently providing the lowest level of service measured by SUPP and in fact falling further behind.

Micro-Analysis results

In the sample of British Columbia school districts the relationship of SU and SUPP to funding changes was similar to that observed in the macro-analysis. Some differences were expected as SU & SUPP were calculated using Instructional (rather than Gross) Expenditure. SU rose to a peak in 1981, declined from 1981 to 1985, and then rose for two years. Overall SU increased 1.8% and thus was very close to the level observed in 1976.

SUPP, however, showed a greater increase (23.9%) than was

evident in the macro-analysis, and indicated that the level of service received by students in 1987 measured by SUPP had climbed back to the level of the peak in 1981.

Significant differences were observed between the mean percentage of instructional positions in the five alternating periods of funding increases and decreases. In both periods of funding decrease there was a significant increase in SMI, indicating that the higher priority was attached to instructional positions than administrative or support positions. Two of the three periods of increased funding produced a decrease in SMI, indicating a tendency to favour administrative and support positions. The first decrease was found to be significant at the .05 level and the second at the .06 level. In the third period of funding increase (1979-1982), a small but statistically significant increase in SMI was evident.

The results of the regression analysis used to determine the influence of various school district characteristics on the response to funding changes necessitated the rejection of four of the five hypotheses. The signs of the coefficients were highly inconsistent, and frequently did not correspond to the anticipated direction. However, it was possible to conclude that during periods of funding decrease it appears that districts with a lower %IP had a greater tendency to favour instruction over administrative and support

positions. There was some evidence that district size and dispersion played a role in increasing SMI in 1986-87, and that the tendency of districts with a lower prevailing %IP to favour instruction is also apparent in periods of funding increase.

Conclusions

Various conclusions can be drawn from this study, providing some answers to Research Question 9 which asked about the implications of the findings for educational policy-makers, practitioners and researchers.

The first impression that emerges is that school systems, at least from the organizational point of view, are either resistant, or else almost impervious, to change. There appears to be a measure of inelasticity both in relation to the demands of the market place and to the pressures of the political forum. The response to the firing of two School Boards in 1985 in British Columbia is yet another example of this, as school operations carried on as usual. Changes in levels of funding and enrolment seem to have but a marginal effect on the overall size and operation of public school systems. There may be, and usually are, perceptions of major consequences, but as this study has demonstrated, service levels either rebound from a temporary set-back or else react less dramatically than might have been expected.

To coin a Canadian metaphor, this might be termed the Zamboni Effect. The Zamboni is an ingenious machine which sweeps up loose ice chippings, melts them down and deposits them as water to re-freeze and make a new, smooth surface. The shape and size of the rink do not alter, and the position of the lines is unchanged. One can only speculate whether the lack of responsiveness in school systems is a product of the organizational metavalue of maintenance, of bureaucratic inertia, or of a tacit public consensus. It must be exphasized that, apart from some implied qualitative aspects of levels and mix of services, this study dealt entirely with quantitative measures. One only has to look, however, at the glittering parade of reformist bandwagons to wonder if this impression of immutability is not transferable to the educational processes of school systems as well.

To complement the first impression is another which emerges from the type of response to external pressures. The micro-analysis revealed statistically different configurations of the proportions of instructional and administrative or support positions in periods of funding increase or decline. The magnitude of these changes, however, suggests a static rather than a dynamic response to pressure. A one or two percent swing in the average percentage of instructional positions translates into only a handful of actual teachers moving to or from the different employment categories. The relative inconclusiveness of the attempt to identify variables which could

significantly affect this pattern is further evidence of this, as is the emergence of the finding that the best predictor for SMI is the antecedent condition. *Plus ça change, plus c'est la meme chose.*

The implications of these conclusions for educational policy-makers and practitioners can be viewed from two perspectives. On the one hand, there is the threat of anomie, the feeling of helplessness in the face of a monolithic organization. There is, of course, a certain cold comfort in this attitude, as it implies that the system will survive in spite of, if not on account of, efforts to change it. On the other hand there is a need to come to terms with the fact that it would take major, long-lasting forces to significantly alter the system. The funding changes examined in the study were perhaps not large enough or sufficiently enduring to bring about the alterations in the system which might have been expected.

The fiscal crisis in the 1970s in New York precipitated the lay-off of 16,000 teachers, a major factor which did result in a reconfiguration of employment patterns for school district personnel. One might have expected a similar pattern in California in the wake of Proposition 13, which slashed property tax revenue for the school boards, but administrators 'discovered' a reserve fund of two billion dollars which certainly dampened the effect (if, simultaneously, justifying the proponents of tax reform). The stringent controls of the

British Columbia restraint program did have some effects, but with the (partial) lifting of restrictions on spending and revenue collection came a move back towards the previous pattern, and a confirmation of inelasticity.

It appears that when funding changes occur there is usually sufficient slack in the system to accommodate the changes without radically altering the organizational structure, a justification of the first two metavalues of maintenance and growth. It is perhaps part of the function of the informal organization to perform this task, as can be seen by the tendency towards chaos when work to rule procedures are followed. It must not be overlooked, however, that another function or *raison d'etre* of the informal organization is to bolster morale. In periods of uncertainty, there is at least the possibility that morale may drop, particularly if role overload is also a factor. If there is the desire at senior government levels to alter the organizational structure and priorities of the school system, it seems likely that any action would only be effective if it was aimed very specifically at a particular target. Global funding cuts or increases seem (from the results of this study) to make merely marginal differences in levels or mix of services, and the school systems appear resilient or unresponsive enough to negate or minimize the impact of these changes.

If funding changes are to be more than a response on the part of

government to changes in economic conditions, then it appears that there needs to be a specific focus for the changes. Either this takes the form of a resource-cost model such as the British Columbia Fiscal Framework, which identifies areas for increased or decreased support (although it does not enforce the allocation of funds in the same ratio) or it involves a major restructuring of the organizational system such as has occurred in the United Kingdom, New Zealand and (most recently) Chicago, where the middle level of school governance - - the school board - - has to all intents and purposes been abolished.

It has been popularly assumed that an increase in administrative and support positions (i.e. a decrease in SMI) is counter-productive from a purely educational standpoint. It is here suggested that the contrary may be true: the presence of additional administrative and support staff may have a positive effect on qualitative measures of educational outcomes by (a) reducing the workload and stress of classroom teachers, thereby rendering them more effective and (b) providing individual assistance to marginal students who might otherwise drop out or fail to graduate. This is an area which merits further attention, as pointed out by Anderson and Mark (1983), and thus has implications for educational researchers.

The indices developed for the study (SU, SUPP and SMI) appear to have some merit for educational policy-making. The first two do

have the advantage of taking into account the level of financial support, the cost of providing teachers and enrolment. As inflationary trends are discounted in the calculation, SU and SUPP do provide at least an indicator of level of educational service which is easily comparable between jurisdictions, regardless of date or geographical location. In this respect they supplement the more usual indicators such as gross or per pupil expenditure, pupil-teacher ratio and class size. Taken in conjunction with these measures, SU and SUPP appear to be useful indicators of level of service.

The value of SMI (the percentage of instructional positions) is less clear. It does provide an easily calculable measure of the mix of services, but whether it indicates a positive or negative impact on the quality of service provided is debatable. At least it adds another dimension and as such it is worthy of the consideration of other researchers.

Recommendations.

Research Question 10 asked what recommendations could be made for improving legislation, policies and procedures concerning education finance. The following recommendations are therefore proposed:

1. In the light of the need for predictability and long term planning, provincial governments should employ funding mechanisms rationally and formally associated with such variables as enrolment and the state of the provincial economy;

2. The indices developed for this study (Staffing Units, Staffing Units Per Pupil, and the Service Mix Index) should be employed in the study of education finance; and further research, using a larger sample, should be undertaken on the matters addressed in the micro-analysis;

3. To facilitate comparison, data collection, and research, provincial governments should be encouraged to use standardized definitions of the basic variables associated with educational administration;

4. A qualitative study of the factors affecting the inelasticity of supply in educational services should be undertaken;

5. In view of the similarity of responses to funding changes from very diverse school districts, provincial governments should review the role of school boards to determine whether, with such apparent consensus, they are really fulfilling their primary task of reflecting specific local needs.

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Appendix A

Macro-analysis: Data Sources

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Statistics Canada (1979b). *Education in Canada: A statistical review for 1977-78.* (Catalogue 81-229). Ottawa: Ministry of Supply and Services.

Statistics Canada (1979c). *Financial statistics of education 1976-77.* (Catalogue 81-208). Ottawa: Ministry of Supply and Services.

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Statistics Canada (1982a). *Advance statistics in education 1982-83.* (Catalogue 81-220). Ottawa: Ministry of Supply and Services.

Statistics Canada (1982b). *Education in Canada: A statistical review for 1980-81.* (Catalogue 81-229). Ottawa: Ministry of Supply and Services.

Statistics Canada (1982c). *Financial statistics of education 1978-79.* (Catalogue 81-208). Ottawa: Ministry of Supply and Services.

Statistics Canada (1982d). *Financial statistics of education 1979-80.* (Catalogue 81-208). Ottawa: Ministry of Supply and Services.

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Statistics Canada (1986b). *Education in Canada: A statistical review for 1984-85.* (Catalogue 81-229). Ottawa: Ministry of Supply and Services.

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Statistics Canada (1987b). *Education in Canada: A statistical review for 1985-86.* (Catalogue 81-229). Ottawa: Ministry of Supply and Services.

Statistics Canada (1987c). *Financial statistics of education 1982-83.* (Catalogue 81-208). Ottawa: Ministry of Supply and Services.

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MACRO-ANALYSIS: PROVINCIAL DATA

B.C.	GDP 1976 = 100	FUNDING $ million (Current)	FUNDING $ million (Constant)	FTE TEACHERS	AV. TEACHER SALARY	FTE PUPILS	STAFFING UNITS	SU PER PUPIL
1976	100.0	972.3	972.3	26,353	17,876	518,705	54,391	0.105
1977	116.4	1,092.0	1,011.6	26,587	19,548	510,621	55,862	0.109
1978	128.2	1,191.0	1,013.7	26,340	21,039	501,026	56,609	0.113
1979	141.1	1,238.8	965.6	26,020	22,915	494,522	54,061	0.109
1980	160.9	1,452.5	1,027.7	26,295	25,233	492,054	57,564	0.117
1981	179.1	1,760.4	1,107.3	26,937	28,516	485,604	61,734	0.127
1982	203.3	2,061.6	1,170.3	26,300	34,221	482,256	60,244	0.125
1983	206.6	1,996.2	1,071.3	25,783	35,876	479,163	55,642	0.116
1984	213.6	2,048.7	1,053.7	24,478	36,452	472,935	56,203	0.119
1985	223.4	2,051.3	1,015.2	23,719	37,255	468,307	55,061	0.118
1986	235.7	2,111.3	1,003.0	23,954	38,141	467,612	55,355	0.118
1987	243.9	2,261.7	1,029.4	24,588	39,216	469,272	57,673	0.123

MACRO-ANALYSIS: PROVINCIAL DATA

ALBERTA	GDP 1976 = 100	FUNDING $ million (Current)	FUNDING $ million (Constant)	FTE TEACHERS	AV. TEACHER SALARY	FTE PUPILS	STAFFING UNITS	SU PER PUPIL
1976	100.0	758.9	758.9	21,622	17,053	432,183	44,502	0.103
1977	110.9	995.9	922.6	21,921	19,162	430,819	51,973	0.121
1978	122.1	937.5	798.0	21,981	19,987	427,889	46,905	0.110
1979	139.7	1,069.0	833.2	22,559	22,639	424,524	47,219	0.111
1980	165.2	1,207.7	854.5	22,755	22,261	427,059	54,252	0.127
1981	192.7	1,495.5	940.7	23,793	24,278	430,465	61,599	0.143
1982	213.3	1,816.4	1,031.2	23,833	27,287	435,457	66,566	0.153
1983	218.4	1,931.0	1,036.3	24,308	33,416	435,053	57,787	0.133
1984	226.3	2,035.5	1,046.9	23,861	36,640	432,642	55,554	0.128
1985	243.2	2,155.8	1,066.9	24,112	37,931	433,642	56,835	0.131
1986	257.6	2,263.8	1,075.5	23,864	39,361	435,988	57,514	0.132
1987	234.4	2,293.7	1,043.9	23,643	39,845	435,588	57,566	0.132

MACRO-ANALYSIS: PROVINCIAL DATA

SASK.	GDP 1976 = 100	FUNDING $ million (Current)	FUNDING $ million (Constant)	FTE TEACHERS	AV. TEACHER SALARY	FTE PUPILS	STAFFING UNITS	SU PER PUPIL
1976	100.0	379.8	379.8	10,689	16,086	212,114	23,611	0.111
1977	112.1	420.8	389.8	10,693	17,639	209,646	23,856	0.114
1978	114.2	461.7	393.0	10,832	19,171	204,432	24,083	0.118
1979	128.9	498.3	388.4	10,776	20,971	200,701	23,761	0.118
1980	144.4	571.5	404.4	10,824	21,556	197,451	26,512	0.134
1981	169.7	661.0	415.8	10,831	23,669	194,378	27,927	0.144
1982	194.5	773.3	439.0	10,672	26,741	193,372	28,918	0.150
1983	198.4	824.5	442.5	10,544	30,247	193,151	27,259	0.141
1984	202.2	872.2	448.6	10,541	32,674	194,594	26,694	0.137
1985	221.2	897.6	444.2	10,634	34,200	194,244	26,246	0.135
1986	225.4	959.6	455.9	10,736	35,910	194,474	26,722	0.137
1987	223.6	1,034.1	470.7	10,688	36,340	194,192	28,456	0.147

MACRO-ANALYSIS: PROVINCIAL DATA

MANITOBA	GDP 1976 = 100	FUNDING $ million (Current)	FUNDING $ million (Constant)	FTE TEACHERS	AV. TEACHER SALARY	FTE PUPILS	STAFFING UNITS	SU PER PUPIL
1976	100.0	400.0	400.0	11,428	15,087	217,235	26,513	0.122
1977	112.8	458.6	424.8	11,539	17,609	213,154	26,044	0.122
1978	118.4	486.3	413.9	11,571	19,156	207,456	25,386	0.122
1979	130.8	529.9	413.0	11,375	20,856	200,654	25,408	0.127
1980	147.1	596.7	422.2	11,177	21,263	196,326	28,063	0.143
1981	159.9	680.0	427.7	11,293	23,832	192,767	28,533	0.148
1982	187.9	784.6	445.4	11,298	28,157	192,601	27,865	0.145
1983	198.8	846.1	454.1	11,200	31,834	191,817	26,579	0.139
1984	208.9	916.3	471.3	11,200	35,518	191,357	25,798	0.135
1985	229.8	954.0	472.1	11,295	36,994	190,776	25,788	0.135
1986	247.7	1,059.8	503.5	11,483	37,937	190,710	27,936	0.146
1987	261.1	1,099.6	500.5	11,657	39,468	189,757	27,861	0.147

Appendix B

Micro-analysis: Published Data Sources

British Columbia Ministry of Education (1978). *Report on education 1976-1977. 106th. Annual report. July 1 1976 to June 30 1977.*Victoria: Queen's Printer.

British Columbia Ministry of Education (1979). *Report on education 1977-1978. 107th. Annual report. July 1 1977 to June 30 1978.* Victoria: Queen's Printer.

British Columbia Ministry of Education (1981). *Report on education 1979-1980. 109th. Annual report. July 1 1979 to June 30 1980.* Victoria: Ministry of Education.

British Columbia Ministry of Education (1982). *Report on education 1980-1981. 110th. Annual report. July 1 1980 to June 30 1981.* Victoria: Ministry of Education.

British Columbia Ministry of Education (1983a). Ministry of Education annual report for the period July 1 1981 to June 30 1982. (111th. Annual report.) Victoria: Queen's Printer.

British Columbia Ministry of Education (1983b). *1981-82 Annual report. Statistical tables.* Victoria: Statistical Services, Data Services Branch, Ministry of Education.

British Columbia Ministry of Education (1984a). *Ministry of Education annual report for the period July 1 1982 to June 30 19823 (112th. Annual report.)* Victoria: Queen's Printer.

British Columbia Ministry of Education (1984b). *1982-83 Annual report. Statistical tables.* Victoria: Statistical Services, Data Services Branch, Ministry of Education.

British Columbia Ministry of Education (1985). *Ministry of Education annual report for the period July 1 1983 to June 30 1984. (113th. Annual report.)* Victoria: Queen's Printer.

British Columbia Ministry of Education (1986). *Ministry of Education annual report for the period July 1 1984 to June 30 1985. (114th. Annual report.)* Victoria: Queen's Printer.

British Columbia Ministry of Education (1987a). *Ministry of Education annual report for the period July 1 1985 to June 30 1986. (115th. Annual report.)* Victoria: Queen's Printer.

British Columbia Ministry of Education (1987b). *Ministry of Education annual report for the period July 1 1986 to June 30 1987. (116th. Annual report.)* Victoria: Queen's Printer.

British Columbia Ministry of Education (1987c). *Public schools statistics to supplement the annual report 1986-87.* Victoria: Queen's Printer.

British Columbia Ministry of Education, Finance Branch (1981). *Comparative and analytical data: 1981 school district budgets.* Victoria: Queen's Printer.

British Columbia Ministry of Education, Finance Branch (1982). *Comparative and analytical data: 1982 school district budgets.* Victoria: Queen's Printer.

British Columbia Ministry of Education, Financial Services Branch (1980). *Comparative and analytical data: 1980 school district budgets.* Victoria: Ministry of Education.

British Columbia Ministry of Education, Schools Operations Branch (1983). *Comparative and analytical data: 1983 school district budgets.* Victoria: Queen's Printer.

British Columbia Ministry of Education, Schools Operations Branch (1984). *Comparative and analytical data: 1984 school district budgets.* Victoria: Queen's Printer.

British Columbia Ministry of Education, Schools Operations Branch (1985). *Comparative and analytical data: 1985 school district budgets.* Victoria: Queen's Printer.

British Columbia Ministry of Education, Schools Operations Branch (1986a). *Comparative and analytical data: 1985/86 school district budgets.* Victoria: Queen's Printer.

British Columbia Ministry of Education, Schools Operations Branch (1986b). *Comparative and analytical data: 1986/87 school district budgets.* Victoria: Queen's Printer.

British Columbia Ministry of Education, Science and Technology (1980). *Report on education 1978-1979. 108th. Annual report. July 1 1978 to June 30 1979.* Victoria: Ministry of Education, Science and Technology.

Micro-analysis: Other Data Sources

Forms B and J: British Columbia Ministry of Education. *British Columbia Public School Teacher Information. September 30.* 1976 - 1982. Produced by Educational Data Services, Ministry of Education. Printed by B.C. Research, Vancouver.

Report 1585: British Columbia Ministry of Education. *Comparison of current to prior year Special Education Program headcount enrolment. Source: Form 1513 or equivalent, September 30.*

Report 2074: British Columbia Ministry of Education. *Full-Time Equivalent (F.T.E.) teachers, by Function, within school district. Source: Forms 1515 and 1516 or equivalents, September 30.*

Reports 2075A,B,C,D,E: British Columbia Ministry of Education. *F.T.E teachers by program within Function, within district. Source: Forms 1515 and 1516 or equivalents, September 30.* 1984, 1985, 1986-87, 1987-88.

Report 2086: British Columbia Ministry of Education. *F.T.E. teachers by job position. Source: Form 2003, September 30.* 1986-87, 1987-88.

Table 14: British Columbia Ministry of Education. (30 May, 1984).*Relative residential assessed values per FTE pupil (1983 -84).*

Table 12: British Columbia Ministry of Education. (15 June, 1986). *Changes in residential tax rates, assessed values and tax requisitions between 1985 and 1986 calendar years.*

MICRO-ANALYSIS: DATA FOR REGRESSION ANALYSIS

REGRESSION 1 1976-1978 (INCREASE)	School District	Annual Average Δ%IP	Enrolment (SP) 1976	Wealth ($PP) 1978	% Special Ed. (SPED) 1976	Dispersion (DISP) 1976	%IP at Base (STAT) 1976
	7	**-1.1**	4,266	29,457	No Data	2.35	83.5
	9	**-1.3**	2,932	20,621		4.01	82.4
	10	**-1.2**	1,030	26,116		0.26	87.3
	11	**-1.7**	4,754	28,618		11.06	83.7
	13	**-3.7**	770	17,591		0.44	88.6
	14	**-0.7**	2,484	17,879		5.14	83.6
	23	**-0.5**	16,220	19,570		8.23	82.1
	28	**0.0**	5,594	21,077		0.71	81.5
	31	**-1.4**	2,571	22,447		1.02	85.1
	38	**-0.5**	18.137	26,389		370.14	82.4
	43	**-1.3**	23,284	19,593		291.05	82.1
	49	**-3.0**	845	8,506		0.09	87.6
	54	**-0.5**	2,762	13,935		0.78	83.8
	55	**-0.5**	1,935	21,225		0.34	86.6
	57	**-1.0**	20,701	22,281		1.04	80.5
	59	**0.1**	5,481	13,752		0.56	79.9
	60	**-1.7**	5,489	24,873		0.15	84.4
	72	**-0.8**	5,769	30,646		0.99	81.0
	81	**-0.7**	1,106	41,806		0.03	82.4
	89	**-1.2**	5,734	18,806		1.89	80.2

MICRO-ANALYSIS: DATA FOR REGRESSION ANALYSIS

REGRESSION 2 1978-1979 (DECREASE)	School District	Annual Average Δ%IP	Enrolment (SP) 1978	Wealth ($PP) 1978	% Special Ed. (SPED) 1978	Dispersion (DISP) 1978	%IP at Base (STAT) 1978
	7	**1.2**	4,097	29,547	No Data	2.25	81.3
	9	**4.0**	2,797	20,621		3.83	79.8
	10	**0.9**	1,051	26,116		0.26	84.9
	11	**2.3**	4,490	28,618		10.44	80.4
	13	**1.8**	726	17,591		0.42	81.2
	14	**-0.5**	2,342	17,679		4.85	82.3
	23	**0.9**	15,775	19,570		8.00	81.1
	28	**0.9**	5,418	21,077		0.68	81.4
	31	**-1.0**	2,547	22,447		1.01	82.4
	38	**0.4**	17,824	26,389		366.65	81.3
	43	**2.1**	22,085	19,593		276.06	79.6
	49	**2.2**	802	8,506		0.08	81.7
	54	**0.4**	2,817	13,935		0.80	82.7
	55	**-0.6**	1,920	21,225		0.34	85.6
	57	**1.9**	20,664	22,281		1.04	78.5
	59	**0.8**	5,291	13,752		0.54	80.1
	60	**1.7**	5,690	24,873		0.16	81.0
	72	**3.1**	5,781	30,646		0.99	79.4
	81	**1.2**	1,135	41,806		0.03	81.0
	89	**2.0**	5,548	18,860		1.83	77.8

MICRO-ANALYSIS: DATA FOR REGRESSION ANALYSIS

REGRESSION 3 1979-1982 (INCREASE)	School District	Annual Average Δ%IP	Enrolment (SP) 1979	Wealth ($PP) 1979 ('78$)	% Special Ed. (SPED) 1979	Dispersion (DISP) 1979	%IP at Base (STAT) 1979
	7	**-0.5**	4,006	32,652	No Data	2.20	82.5
	9	**-1.5**	2,719	23,089		3.72	83.8
	10	**1.6**	984	22,115		0.25	85.8
	11	**0.8**	4,277	32,261		9.95	82.7
	13	**1.6**	712	19,945		0.41	83.0
	14	**1.6**	2,277	19,174		4.71	81.8
	23	**1.4**	15,640	19,787		7.94	82.0
	28	**1.3**	5,221	22,251		0.66	82.3
	31	**-1.9**	2,440	22,846		0.97	81.4
	38	**-0.4**	17,824	27,971		363.76	81.7
	43	**1.0**	21,901	20,589		273.76	81.7
	49	**1.1**	756	8,493		0.08	83.9
	54	**1.9**	2,806	15,941		0.79	83.1
	55	**0.2**	1,907	22,084		0.33	85.0
	57	**1.0**	20,206	23,161		1.01	80.4
	59	**1.8**	5,181	17,409		0.53	80.9
	60	**-0.8**	5,748	28,945		0.16	82.7
	72	**-0.4**	5,799	32,119		0.99	82.5
	81	**0.9**	1,140	45,721		0.03	82.2
	89	**0.9**	5,421	20,748		1.79	79.8

MICRO-ANALYSIS: DATA FOR REGRESSION ANALYSIS

REGRESSION 4 1982-1986 (DECREASE)	School District	Annual Average Δ%IP	Enrolment (SP) 1982	Wealth ($PP) 1982 ('78$)	% Special Ed. (SPED) 1984	Dispersion (DISP) 1982	%IP at Base (STAT) 1982
	7	**1.5**	3,930	7,773	7.95	2.16	80.9
	9	**2.6**	2,517	7,045	7.31	3.44	79.3
	10	**-1.1**	994	6,559	10.03	0.25	90.5
	11	**0.7**	3,938	7,534	6.93	9.16	85.1
	13	**-0.2**	656	9,027	6.41	0.38	87.7
	14	**0.6**	2,215	12,215	10.23	4.59	86.5
	23	**0.2**	15,375	12,506	6.56	7.80	86.1
	28	**0.4**	5,227	5,154	12.46	0.66	86.3
	31	**2.8**	2,273	4,499	7.73	0.91	75.6
	38	**1.9**	17,209	14,834	7.47	351.20	80.5
	43	**0.6**	20,945	10,675	9.02	261.81	84.7
	49	**0.7**	418	5,606	11.44	0.04	87.1
	54	**-0.3**	2,995	5,811	9.63	0.85	88.8
	55	**0.6**	1,778	4,183	12.03	0.31	85.6
	57	**0.8**	19,868	6,178	8.31	1.00	83.3
	59	**0.5**	5,137	5,345	14.68	0.52	96.3
	60	**1.6**	5,694	5,649	15.49	0.16	80.3
	72	**1.7**	5,947	9,107	10.84	1.02	81.2
	81	**0.6**	1,110	4,896	17.04	0.03	84.9
	89	**1.3**	5,659	11,065	7.02	1.86	82.6

MICRO-ANALYSIS: DATA FOR REGRESSION ANALYSIS

REGRESSION 5 1986-1987 (INCREASE)	School District	Annual Average Δ%IP	Enrolment (SP) 1986	Wealth ($PP) 1986 ('78$)	% Special Ed. (SPED) 1986	Dispersion (DISP) 1986	%IP at Base (STAT) 1986
	7	**-0.3**	3,450	7,118	9.92	1.90	87.1
	9	**-0.1**	2,138	7,248	9.98	2.92	89.5
	10	**-1.1**	856	6,543	15.99	0.21	86.1
	11	**0.6**	3,429	7,601	8.48	7.97	88.0
	13	**-0.2**	579	8,059	7.58	0.33	87.0
	14	**0.0**	2,103	9,917	12.26	4.35	88.9
	23	**0.1**	14,741	9,700	8.80	7.48	86.9
	28	**-0.5**	5,111	4,852	13.19	0.65	87.9
	31	**-1.0**	1,924	4,692	9.42	0.77	86.8
	38	**-0.9**	17,073	12,997	10.31	348.43	88.1
	43	**0.2**	20,294	9,233	13.40	253.68	87.2
	49	**-1.0**	420	4,527	15.53	0.04	90.0
	54	**0.3**	2,825	5,328	12.21	0.80	87.7
	55	**-1.5**	1,608	4,842	11.11	0.28	88.2
	57	**0.7**	18,522	5,129	9.47	0.93	86.5
	59	**-0.1**	5,438	4,885	20.22	0.56	88.5
	60	**-1.1**	5,076	4,079	17.08	0.14	86.8
	72	**0.7**	5,922	6,916	12.12	1.01	88.1
	81	**-0.3**	1,009	4,120	35.29	0.03	87.3
	89	**-0.2**	5,004	11,211	10.30	1.65	87.9

MICRO-ANALYSIS: CHANGES IN PERCENTAGE OF INSTRUCTIONAL POSITIONS

S. DISTRICT	T-TEST 1A	%IP 1976	%IP 1978	T-TEST 1B	%IP 1976	%IP'76+Av.Δ
7	1976-1978	83.5	81.3	1976-1978	83.5	82.4
9	(TOTAL	82.4	79.8	(AVERAGE	82.4	81.1
10	INCREASE)	87.3	84.9	INCREASE)	87.3	86.1
11		83.7	80.4		83.7	82.1
13		88.6	81.2		88.6	84.9
14		83.6	82.3		83.6	83.0
23		82.1	81.1		82.1	81.6
28		81.5	81.4		81.5	81.5
31		85.1	82.4		85.1	83.8
38		82.4	81.3		82.4	81.9
43		82.1	79.6		82.1	80.9
49		87.6	81.7		87.6	84.7
54		83.8	82.7		83.8	83.3
55		86.6	85.6		86.6	86.1
57		80.5	78.5		80.5	79.5
59		79.9	80.1		79.9	80.0
60		84.4	81.0		84.4	82.7
72		81.0	79.4		81.0	80.2
81		82.4	81.0		82.4	81.7
89		80.2	77.8		80.2	79.0
		83.44	81.18		83.44	82.31

MICRO-ANALYSIS: CHANGES IN PERCENT, ~E OF INSTRUCTIONAL POSITIONS

S. DISTRICT	T-TEST 2	%IP 1978	%IP 1979
7	1978-1979	81.3	82.5
9	(DECREASE)	79.8	83.8
10		84.9	85.8
11		80.4	82.7
13		81.2	83.0
14		82.3	81.8
23		81.1	82.0
28		81.4	82.3
31		82.4	81.4
38		81.3	81.7
43		79.6	81.7
49		81.7	83.9
54		82.7	83.1
55		85.6	85.0
57		78.5	80.4
59		80.1	80.9
60		81.0	82.7
72		79.4	82.5
81		81.0	82.2
89		77.8	79.8
		81.18	82.46

MICRO-ANALYSIS: CHANGES IN PERCENTAGE OF INSTRUCTIONAL POSITIONS

S. DISTRICT	T-TEST 3A	%IP 1979	%IP 1982	T-TEST 3B	% IP 1979	%IP'79+Av.Δ
7	1979-1982	82.5	80.9	1979-1982	82.5	82.0
9	(TOTAL	83.8	79.3	(AVERAGE	83.8	82.3
10	INCREASE)	85.8	90.5	INCREASE)	85.8	87.4
11		82.7	85.1		82.7	83.5
13		83.0	87.7		83.0	84.6
14		81.8	86.5		81.8	83.4
23		82.0	86.1		82.0	83.4
28		82.3	86.3		82.3	83.6
31		81.4	75.6		81.4	79.5
38		81.7	80.5		81.7	81.3
43		81.7	84.7		81.7	82.7
49		83.9	87.1		83.9	85.0
54		83.1	88.8		83.1	85.0
55		85.0	85.6		85.0	85.2
57		80.4	83.3		80.4	81.4
59		80.9	86.3		80.9	82.7
60		82.7	80.3		82.7	81.9
72		82.5	81.2		82.5	82.1
81		82.2	84.9		82.2	83.1
89		79.8	82.6		79.8	80.7
		82.46	84.17		82.46	83.03

MICRO-ANALYSIS: CHANGES IN PERCENTAGE OF INSTRUCTIONAL POSITIONS

S. DISTRICT	T-TEST 4A	%IP 1982	%IP 1986	T-TEST 4B	%IP 1982	%IP'82+AV.Δ
7	1982-1986	80.9	87.1	1982-1986	80.9	82.4
9	(TOTAL	79.3	89.5	(AVERAGE	79.3	81.9
10	DECREASE)	90.5	86.1	DECREASE)	90.5	89.4
11		85.1	88.0		85.1	85.8
13		87.7	87.0		87.7	87.5
14		86.5	88.9		86.5	87.1
23		86.1	86.9		86.1	86.3
28		86.3	87.9		86.3	86.7
31		75.6	86.8		75.6	78.4
38		80.5	88.1		80.5	82.4
43		84.7	87.2		84.7	85.3
49		87.1	90.0		87.1	87.8
54		88.8	87.7		88.8	88.5
55		85.6	88.2		85.6	86.2
57		83.3	86.5		83.3	84.1
59		86.3	88.5		86.3	86.8
60		80.3	86.8		80.3	81.9
72		81.2	88.1		81.2	82.9
81		84.9	87.3		84.9	85.5
89		82.6	87.9		82.6	83.9
		84.17	87.72		84.17	85.05

MICRO-ANALYSIS: CHANGES IN PERCENTAGE OF INSTRUCTIONAL POSITIONS

S. DISTRICT	T-TEST 5	%IP 1986	%IP 1987
7	1986-1987	87.1	86.8
9	(INCREASE)	89.5	89.5
10		86.1	85.0
11		88.0	88.6
13		87.0	86.8
14		88.9	88.9
23		86.9	87.0
28		87.9	87.4
31		86.8	85.7
38		88.1	87.2
43		87.2	87.3
49		90.0	89.0
54		87.7	88.0
55		88.2	86.7
57		86.5	87.1
59		88.5	88.4
60		86.8	85.7
72		88.1	88.9
81		87.3	87.0
89		87.9	87.7
		87.72	87.44