Municipal Financial Analysis Handbook

December 1984

Municipal Financial Analysis Handbook

Prepared for

The Office of Housing
and Urban Programs
U.S. Agency for International Development

by

James S. McCullough
James F. Hicks, Jr.
Research Triangle Institute

December 1984

Table of Contents

Table of Contents
Page Two

Table of Contents
Page Three

CHAPTER 1
INTRODUCTION

Preface

This Handbook has been prepared under a work order with the Office of Housing and Urban Programs of the U.S. Agency for International Development in response to a growing need for financial management tools appropriate to developing country municipalities. Its purpose is to assist local government officials of developing countries in analyzing municipal finance data.

Financial data analysis is the foundation on which improvements in local government financial management are built. All types of interventions in local financial management are grounded in sound financial analysis. Furthermore, the analytical techniques presented in this Handbook are drawn from field experience in a number of developing countries. This Handbook provides the opportunity to pull together this experience and make it available to other communities.

The Handbook is intended to be more than a reference manual for local officials. It is also designed for use in training courses on local management and finance. Almost all of the applications and exercises in this Handbook have been used in the Urban Financial Management Training Program conducted by the Research Triangle Institute. Not only have these techniques proved successful in the Institute's training program, but many have been incorporated by the training participants in training courses in their own countries.

The authors are indebted to all of those who have participated in developing and refining the techniques presented in this Handbook. We consider the Handbook as only the beginning of the development of a set of tools and techniques for improving local government finance. We look forward to the current work being supplanted as more such analytical tools are developed.

1.1 Why Do Financial Analysis?

Analysis of financial information is the cornerstone of improved financial management in local government. Without the ability to understand the current financial situation and project future revenues and expenditures, local governments cannot begin to improve their management performance.

Local governments need to improve financial management for a number of reasons. First, local governments are assuming more and more responsibility for providing public services. Local governments need to raise more revenues to pay for these services and to manage ever-increasing budgets.

Second, central government grants, which have paid for many local services in the past, cannot keep up with the growing needs. Many central governments simply cannot afford to support expanding local municipal services. Instead, it is falling to local governments to raise revenues and to improve efficiency in local service delivery.

Third, citizens are demanding better quality services and, in many cases, are willing to pay for them. However, these citizens are demanding good service at reasonable costs, which requires sound financial management.

Sound financial management relies heavily on accurate analysis of financial data. Financial analysis can help a municipal manager answer the following types of questions:

- How much can we afford to borrow to build a new water system? How much can we afford in payments each year if we do borrow?
- Should we increase the property tax rate this year? By how much?
- Is it worth the expense to collect a street vendor fee?

- What is it really costing us to run the municipal market? Are market fees keeping up with the increase in sales volume at the market?

- Are we collecting as much revenue as we should from business taxes?

- Are our water rates fair? How much is it costing for each household and how much subsidy is being provided to each user?

- How much can we expect to receive in central government grants next year?

- Which local revenue sources can be expanded the most? Where is the biggest payoff in improvements in revenue collection?

The financial analysis techniques presented in this Handbook will help you answer these types of questions. The Handbook will show you first how to assemble the right information. The basic information needed is comprised of revenue collection and expenditure data of local governments. Fortunately, this type of information is routinely maintained by almost all local governments.

In most cases, this information is also reported to central government ministries, usually the Ministry of Finance, the Ministry of Local Government, or the Ministry of Interior. This means that the analysis techniques presented in this Handbook can be used by central government agencies as well as by individual local governments.

1.2 How to Use This Handbook

The purpose of this Handbook is to provide a set of techniques for analyzing financial data of local governments in order to help local government officials make decisions about local financial management. The techniques have been drawn from actual experience in a number of different countries. They are simple to use and are designed to produce information that can be readily used in day-to-day decisionmaking.

The Handbook is designed first as a guide and reference manual for local government officials. Second, the Handbook can be used as a teaching text in courses on local government financial management. A special note for course instructors is included in the appendix to this Handbook.

The Handbook is divided into four substantive chapters, following this introductory chapter. The second chapter introduces the reader to the concepts of financial analysis and describes the uses of this type of analysis. This chapter also describes the sources of data that are needed to carry out the analyses.

The subsequent three chapters present the analytical techniques, organized around three major topics:

- Local revenue generation
- Expenditure control
- Balancing revenues and expenditures.

Each of these three chapters presents the analytical methods along with case studies and examples to show how the methods are applied. To aid the reader, a "Chapter Overview" is presented at the beginning of Chapters 2

through 5 which outlines the topics and techniques covered in each subsection of those chapters.

The Handbook presents a large number of analytical techniques, some of which will not be appropriate for all situations. The user of the Handbook must therefore choose the analyses that help answer the questions of most interest to individual municipalities and country situations. In order to select the appropriate techniques, the user is encouraged to read through the Handbook first to see how all the techniques are used. The final section of the Handbook, entitled "How to Get Started" helps the reader select a starting point for using the financial analysis techniques. This section also describes how to conduct a summary analysis at both the national and local municipal levels.

A glossary of financial management terms is included in the appendix.

1.3 Who Can Use This Handbook?

The analytical techniques presented in this Handbook are directed not only at local government administrators, but also at central government agency staff concerned with local finance and municipal management. The Handbook is also intended to be used in training courses on local government financial management.

LOCAL GOVERNMENT OFFICIALS CAN USE THIS HANDBOOK

- To conduct assessments of current financial conditions and to project changes in financial status into the future.
- To help make decisions on capital investments and to assess how much debt the government can carry.
- To identify under-used revenue sources and to assess the potential payoff in improvements in revenue collection.
- To evaluate the rate structures of public services that are provided on a fee-for-service basis.
- To assess the impact of previous tax rate changes and to forecast the impact of proposed changes on total revenues.

CENTRAL GOVERNMENT AGENCY STAFF CAN USE THIS HANDBOOK

- To identify problem areas in local government finance that require national attention.
- To pinpoint training and technical assistance needs by problem area and by individual locality.
- To assess the ability of local governments to participate in loan programs and their ability to manage cost recovery in public services.
- To assess the capacity of local governments to assume more responsibility for financing and managing public services.

- To evaluate the impact of changing central government transfer payments to local governments.

MANAGEMENT TRAINING STAFF CAN USE THIS HANDBOOK

- As a course text for teaching local government financial analysis.

- As a source of supplementary case studies and examples for courses already being taught in municipal administration and financial management.

- As a model for developing new case materials and exercises based on local finance data.

CHAPTER 2
BASIC CONCEPTS AND DATA NEEDS

Chapter Overview

This chapter serves as an introduction to the basic concepts of financial analysis and describes the uses of this type of analysis. The concepts presented in this chapter set the framework in which the specific analytical techniques will be carried out. The chapter also describes the data needs for undertaking financial analysis.

The chapter is divided into three main sections:

2.1 Financial Analysis Framework

--- presenting the basic relationships between revenue generation, expenditure control, and financial balance

2.2 Uses of Financial Analysis

--- providing selected examples of the ways in which municipal financial analysis can be used to answer pressing questions in municipal management

2.3 Data Needs

--- defining specific data items to be collected as well as providing examples of data collection forms. Data needs are grouped into four categories:

- revenue and expenditure history of target municipalities
- population and inflation estimates

- selected information on housing, income, and municipal services (as available from existing studies) and

- comparative revenue and expenditure data from other municipalities.

2.1 Financial Analysis Framework

In this Handbook, we are interested in the most basic relationships in local government finance. These relationships are divided into three major categories:

- Revenue Generation -- how well the government is tapping the revenue potential available to it and the costs of increasing revenues.
- Expenditure Control -- what it costs to deliver public services and the factors that cause costs to rise.
- Financial Balance -- the balance between revenues and expenditures at present and the trends projected into the future.

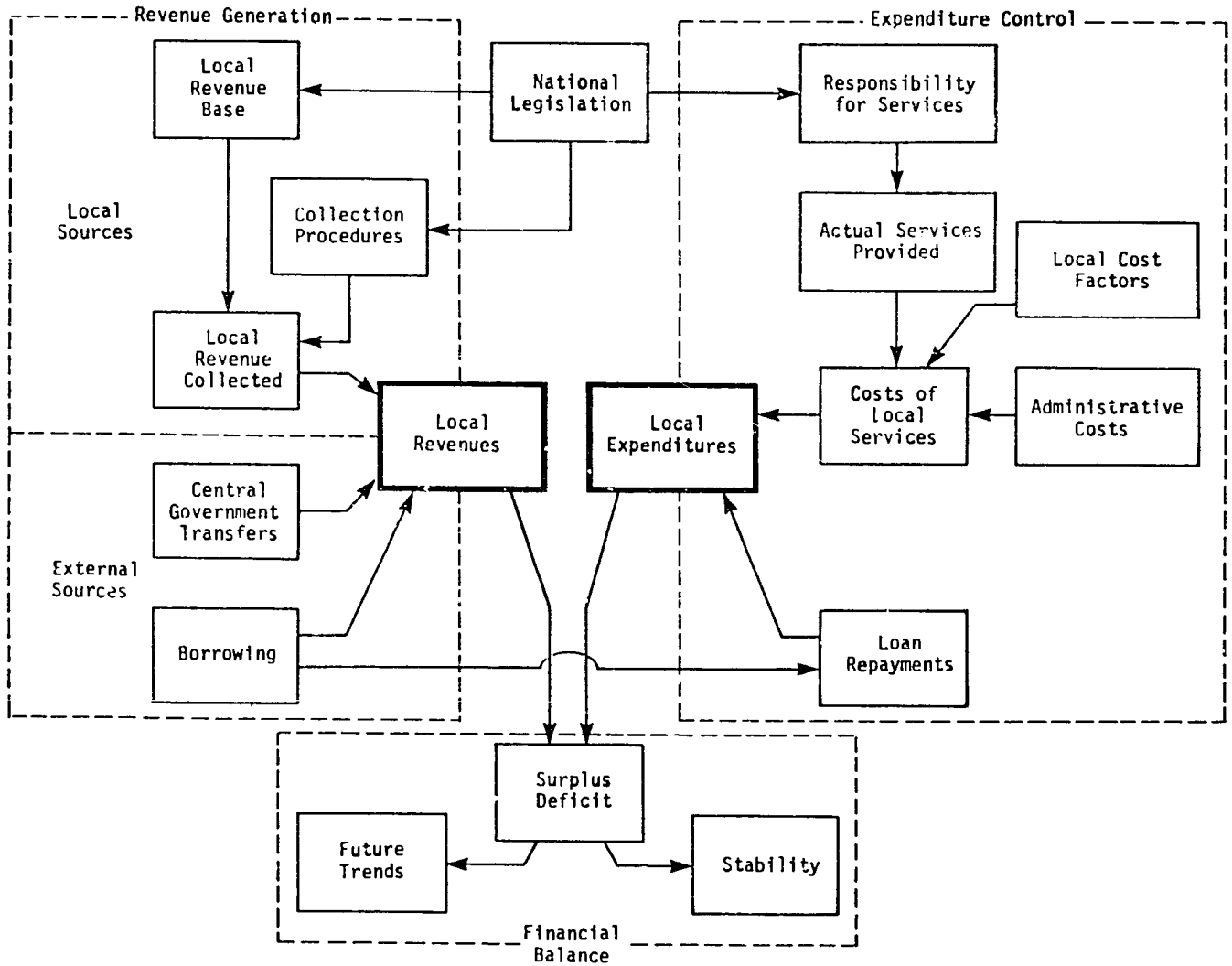
The key factors in revenue generation, expenditure control, and financial balance are shown in Figure 1. Understanding Figure 1 is essential to understanding how to analyze financial data.

In looking at the Revenue Generation block in Figure 1, we are concerned both with LOCAL SOURCES and with EXTERNAL SOURCES of revenue. LOCAL SOURCES are those raised directly from the local community such as the local business licenses and property taxes. EXTERNAL SOURCES are those that come from outside the local community such as central government grants and borrowing.

In looking at local revenue sources we are concerned first with the size of the LOCAL REVENUE BASE. This is the amount of revenue that the local government is entitled to collect; it is usually set by national law which empowers local government to collect certain types of taxes and other fees. If the local government were 100 percent efficient in local revenue generation, it would collect 100 percent of the local revenue base. However, COLLECTION PROCEDURES, which make up the second major component of the Revenue Generation block, are never 100 percent efficient for several reasons. First, local governments may not try to collect all

Figure 1

Diagram of Fundamental Relationships
in Financial Management



types of revenues that the law allows them; second, even the best collection systems will miss some revenue.

In looking at external sources of revenues, we are concerned first with CENTRAL GOVERNMENT GRANTS which can account for a large portion of some local government budgets. Second, we are concerned with revenue derived from BORROWING, usually from a central government agency or bank. Borrowing carries with it the obligation to repay the loan, so it also generates a future cost on the expenditure side of the diagram. Central government grants can also create a future expenditure obligation if the grant is used for capital construction (such as a water system) which creates a need for future operation and maintenance costs.

In looking at the Expenditure block of Figure 1, we are concerned first with the RESPONSIBILITY FOR SERVICES which determines which public services the local government is mandated by law to provide. This can vary greatly from country to country. Second, we are concerned with the actual AMOUNT OF SERVICES PROVIDED because local governments often provide fewer services than they are legally responsible for. The costs of providing services is determined by the LOCAL COST FACTORS (costs of labor and materials) of those particular services plus the ADMINISTRATIVE COSTS of running the local government. In addition, governments that have borrowed money in the past have LOAN REPAYMENTS, which are part of local government expenditures.

Revenues and Expenditures come together in the Financial Balance block. Financial Balance is simply the comparison of revenues to expenditures. If revenues exceed expenditures, there is a surplus; if expenditures are greater than revenues, there is a deficit. Here we are concerned with both the current balance in any one year and also with the TREND into the future; that is, the pattern of surpluses or deficits that can be predicted. We are also interested in the STABILITY of the financial

balance from year to year -- whether there are wide swings between surplus and deficits and what causes these swings.

This overview has presented the main components on which financial analysis is carried out. The next section describes the major uses for financial analysis, showing just how these components come into play.

2.2 Uses of Financial Analysis

Financial analysis can be used to answer a number of questions important to local government management. We have selected five of the most important applications to show just how financial analysis can be used. The five examples include

- Identifying underused revenue sources
- Projecting revenue and expenditure trends into the future
- Assessing debt carrying capacity of local governments
- Evaluating the impact of rate changes in local fees and licenses and
- Improving cost efficiency of local services.

Financial Analysis Can Identify Underused Revenue Sources

An important use of financial analysis is to pinpoint which local revenues can be increased and by how much. This can be done for a single municipality or for groups of municipalities. Furthermore, the techniques used may vary depending on the type of data one has. Several different methods are presented in this Handbook and are described in detail in Chapter 3.

For example, we present in Chapter 3 techniques that enable a municipality to compare its revenue collections to other municipalities and to judge how much those collections can reasonably be increased. Techniques for analyzing the yield of individual revenue sources, such as the property tax, are presented in detail. In addition, there are methods for determining if a poor yield of the tax is due to poor collection procedures or lack of updating the tax rolls.

Figure 2

Property Tax Collections per Capita, Comparing One Municipality to All Other Municipalities

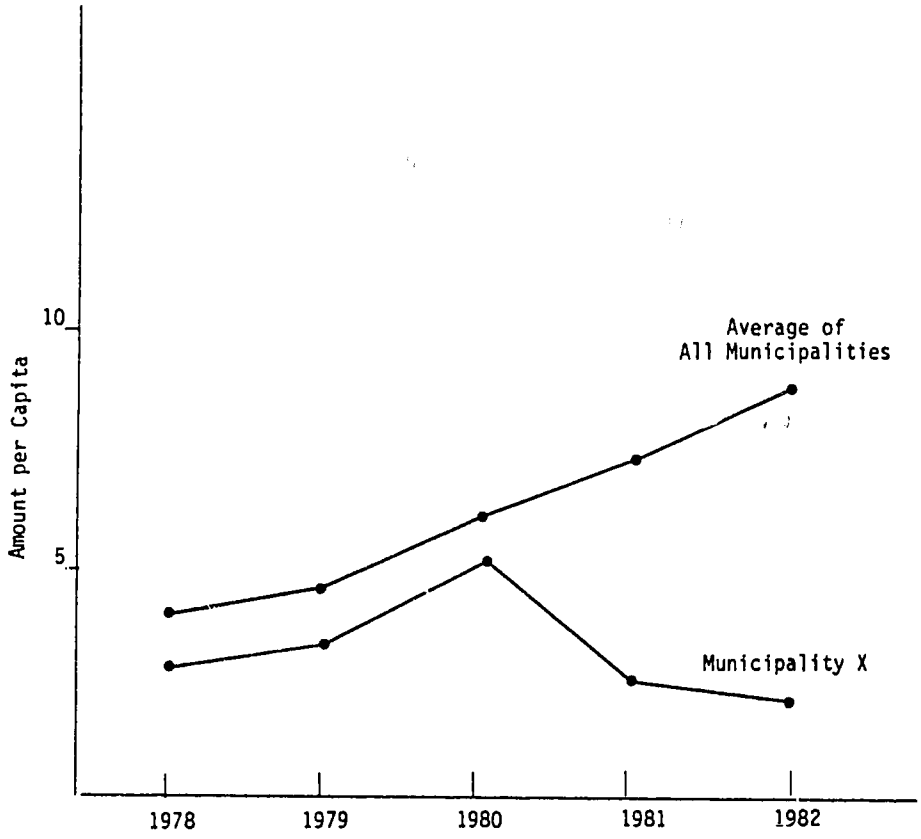


Figure 2 above shows an example of one of the analyses of revenue yield, showing a comparison of one municipality's property tax collections per capita to the average of all municipalities in the country. This analysis allows us to see the falling performance of municipality X and to estimate how much the municipality should be collecting now.

The information in Figure 2 tells us not only that municipality X has a declining property tax collection per capita, but that compared to other cities, the municipality is really losing ground at a tremendous rate. Furthermore, we see that the problem began in 1981 -- until that time, municipality X was following closely the trend of other cities, albeit somewhat below the average. We may also use the information in Figure 2

to estimate what municiaplity X has "lost" in potential revenue by not keeping up with the upward trend of other cities.

Financial Analysis Can Assess Current Conditions and Project Future Trends

Financial analysis can help local officials appraise the current financial status and extend that analysis into the future. The importance of being able to assess future trends in financial condition is shown by the example in Figure 3.

Figure 3

Example of a Municipality's Revenues, Expenditures and Balance

(All figures in thousands)

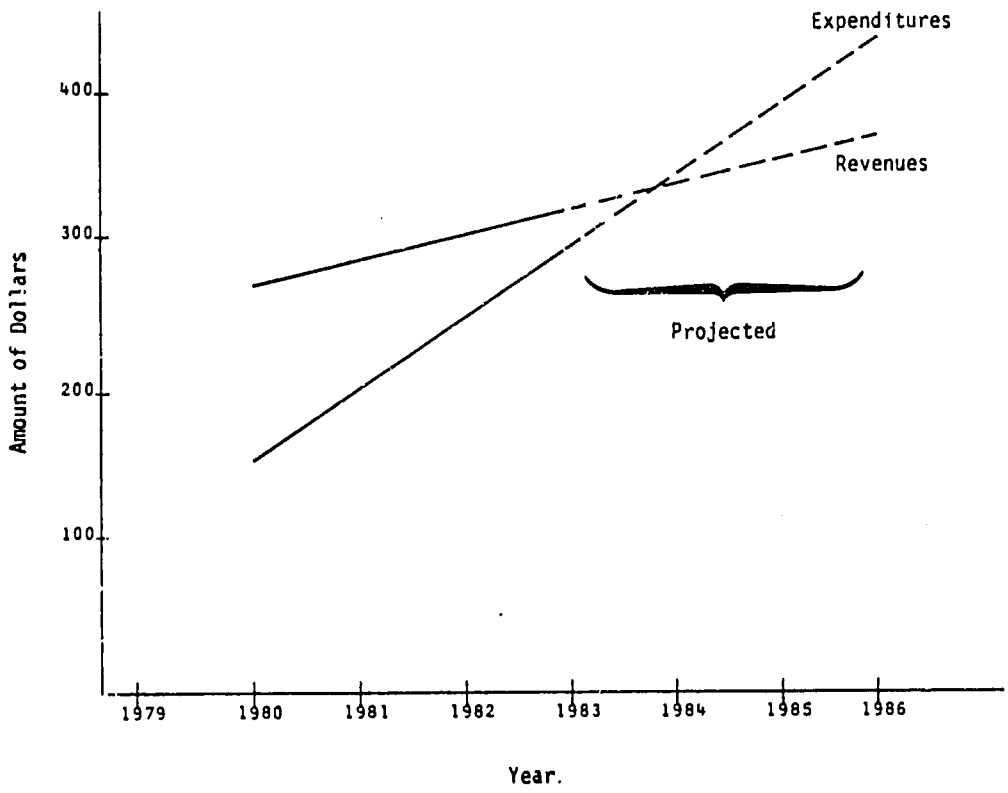
Year	Revenues			Expenditures	Balance (Surplus)
	Local Taxes & Fees A	Central Govt Grants B	Total Revenues C=A+B	Total D	E=C-D
1979	120	150	270	150	+120
1980	130	155	285	180	105
1981	125	175	300	215	85
1982	125	190	315	260	55
1983	130	200	330	310	20

Figure 3 shows the revenues and expenditures for a local government over the past five years. A superficial look at the numbers shows that every

year there is a surplus of revenues over expenditures. However, if we draw a graph of revenues and expenditures over the five-year period we see that expenditures have been rising much faster than revenues (Figure 4).

Figure 4

Revenue and Expenditure Trends
(from Figure 3)



If we project the trends of revenues and expenditures over the next few years on the graph, we see the surplus becoming a sharp deficit. Furthermore, if we look at the relationship between local revenues and central government grants in Figure 3, we see that the growth in total revenues is made up of increases in the central government grants. Local revenues are not increasing at all.

We can use analysis of trends to determine how much revenues need to rise to match future expenditures. Or, we can determine the level at which expenditures need to be kept in order to stay in balance with local resources.

We can also use this type of analysis to answer some "what-if" questions. For example, in Figure 3, what would be the impact on local revenue needs, if central government grants were frozen at the current level? The techniques presented in Chapters 3 and 4 allow us to answer these types of questions.

Financial Analysis Can Be Used to Assess Debt Carrying Capacity of the Local Government

The preceding discussion on financial trend analysis can be extended to look at the ability of a local government to pay back loans. Local governments need to be able to project the impact of loan repayments on local finances before borrowing the money. Many times, local governments borrow funds for projects that appear to be good investments, only to find that they impose a serious drain on the community's financial resources.

For example, many communities borrow money to upgrade municipal markets, assuming that revenues from market fees will more than pay for the costs of the improvements. However, the costs of repaying the loan may drive up market fees, causing some sellers to leave the market. This, in turn, could cause market revenues to fall below expenses with the difference having to come from the municipal general fund. Figure 5 shows the impact of this occurrence on the revenues and expenditures of a municipal market upgrading project. The figure shows the expenses and revenues of the old market compared to estimated amounts for the proposed new market. Included in the figure are two "scenarios" reflecting different

Figure 5

Simplified Balance Sheet for Municipal
Market Upgrading Project

	Old Market	New Market	
Expenses		Scenario A*	Scenario B*
Fee Collectors Salaries	1,500	1,500	1,500
Maintenance	8,000	8,000	8,000
Water	500	2,000	2,000
Electricity	0	3,500	3,500
Debt repayment	0	7,500	7,500
Total Expenses	10,000	22,500	22,500
Revenues			
Number of daily selling licenses	600	800	450
Rate/each	25.00	25.00	40.00
Total Revenue	15,000	20,000	18,000
Net Revenue (Revenue - Expenses)	+5,000	-2,500	-4,500

* Scenario A assumes number of seller's licenses will increase by 1/3 and fee will remain the same.

Scenario B assumes fee will go up and number of sellers will drop by 25%.

assumptions about the number of sellers who would use the market at different market-fee rates.

Techniques presented in this Handbook show how a local government could approach the particular debt problem described above. This includes techniques for assessing the impact of changes in market fees as well as analyzing the impact of the shortfall in market revenues on local government finances. Also included are considerations of the municipal government's cash flow position and the use of loan grace periods to defer interest payments until investments start to generate revenues.

Financial Analysis Can Be Used to Assess the Impact of Rate Changes in Local Taxes and License Fees

Local officials are frequently faced with decisions on raising license and tax rates. Will a tax rate increase bring in more revenue or simply increase tax evasion? Is the government collecting license fees from all persons who should be paying?

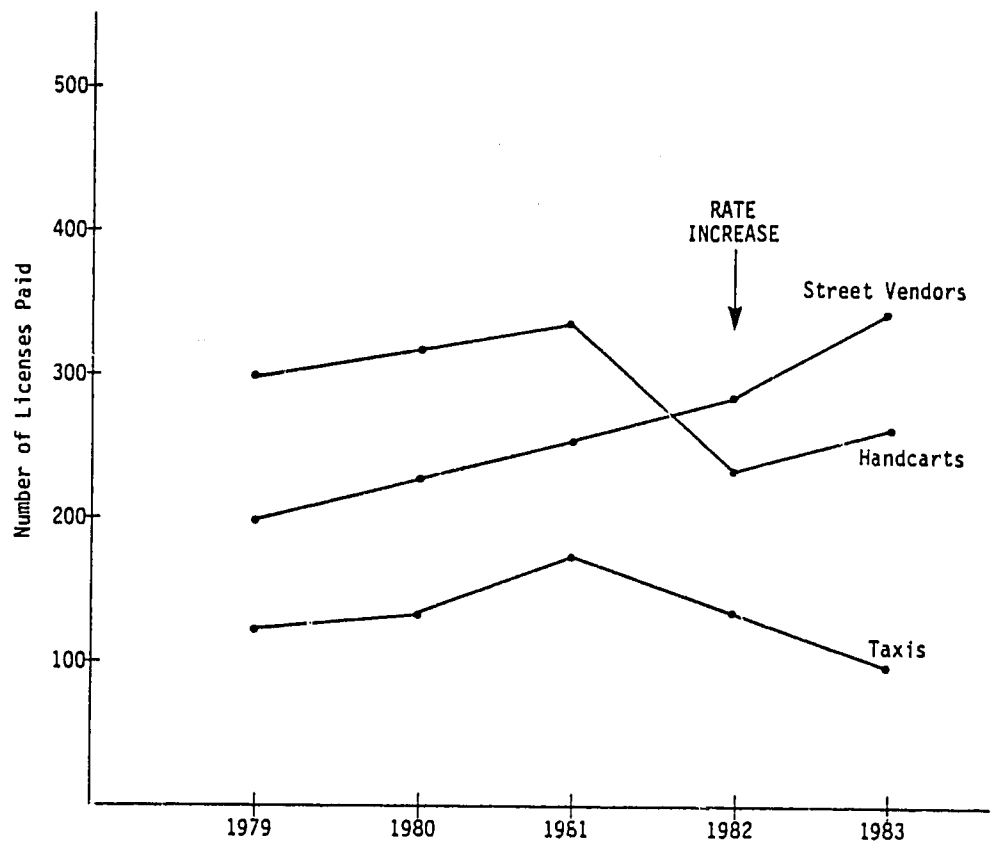
Financial analysis can be used to determine the impact of changing rates on taxes and license fees. This is useful in deciding on appropriate rate setting and on identifying where collection problems exist.

This Handbook presents techniques for analyzing the past performance of license fees, enabling us to see where current collections may be less than expected. Techniques are also presented that show the impact of rate increases on fee payer compliance. For example, Figure 6 shows a graph of the number of license fee payers for three different licenses in a municipality. The figure shows graphically how a rate increase in 1982 across all three licenses has different impacts on fee paying compliance.

In Figure 6 we see that, in the case of street vendors, the rate increase had no impact, as the number of licensees continued its upward trend. However, the other two groups showed marked drops in the number of persons paying the fees. The drop in the number of people paying the handcart and taxi license fees means that either many are avoiding payment of the fee or the rate increase drove a lot of them out of business. If the reason is avoidance, the local government should be able to increase enforcement and raise revenues. If the fee is too high, the local government should roll back the rate increase.

Figure 6

Graph Showing Change in License Fee Paying Compliance as a Result of Fee Increases



Financial Analysis Can Be Used to Assess the Efficiency of Public Services

Financial analysis can be used to improve the efficiency in public service delivery. This is done first by analyzing the costs incurred in producing public services. Second, for services that operate on a self-financing basis, we can analyze the revenues generated versus the costs of providing the service.

Figure 7 shows an example of costs in refuse collection for three cities. Cities A and B seem to be spending about the same amount while City C spends quite a bit more but also collects more refuse. What can we learn from these figures?

Figure 7

Total Costs for Refuse Collection
for Three Cities, 1982

(All costs in $1,000)

Refuse Collection Expenditures	City A	City B	City C
Department administration	200	300	500
Equipment (trucks) depreciation	250	240	600
Fuel	15	20	30
Maintenance	10	20	30
Labor	400	400	600
Land fill costs	25	20	30
Total costs	900	1,000	1,780
Tons of refuse collected per day	405	305	605

The easiest way to compare service delivery costs is to standardize those costs on some common basis. Refuse collection is fairly simple to do by translating the total costs into costs per ton of refuse collected. Figure 8 shows this calculation for the three cities in Figure 7.

From Figure 8 we now see that City A has the lowest total cost per unit and City B has the highest. Furthermore, we see that City B's costs are higher because of higher administrative costs and labor costs. Also, City B is spending more on fuel and truck maintenance than the other two cities. City C has a high cost of equipment and a much higher

Figure 8

Standardized Comparisons of Refuse Collection Costs for Three Cities (from Figure 7)

Expenditure Category	Costs per Ton of Refuse Collected		
	City A	City B	City C
Department Administration	5.00	10.00	8.33
Equipment Depreciation	6.25	8.00	10.00
Fuel	0.38	0.67	0.50
Maintenance	0.25	0.67	0.33
Labor	10.00	13.33	10.00
Landfill Costs	0.63	0.67	0.50
Total Costs/Ton	22.50	33.33	29.66

administrative cost than City A. An official from City B can use this information

- To determine that his city is spending too much money on refuse collection
- To pinpoint which cost components are out of line with other similar cities and
- To estimate how much his city could save on refuse collection expenditures if they were as efficient as City A.

This type of analysis can be used for all types of public services where the service provided can be measured. It is presented in more detail in Chapter 4 along with other analytical techniques for improving expenditure efficiency.

2.3 Data Needs

The type of information needed for financial analysis is quite simple and usually readily available. There are four types of information.

1. Revenue and expenditure data of the local government for the past three- to five-year period.

2. Estimates of population size and inflation rates for the same period of time covered by the revenue and expenditure data.

3. Additional secondary information available from studies on housing, income, and municipal services.

4. Information on revenues and expenditures of other local governments in the country.

The essential data needs are comprised of the first two categories of information listed above, the revenue and expenditure data, and the population and inflation estimates. The other types of information will allow us to do more and different kinds of analysis but are not absolutely required to get started. Please keep in mind that this information is already routinely recorded by local agencies. Assembling it for financial analysis is not difficult and does not take much time. However, there are a few commonsense rules to follow to make sure the data are accurate and most useful. These rules are discussed in the following sections.

2.3.1 Revenue and Expenditure Data

Two points need to be kept in mind when assembling this information. First, it is important to collect <u>consistent</u> data when you are collecting data for several different years. For example, if you are obtaining the total property tax amount collected in one year, which includes the amount of arrears collected, then you should make sure that the amounts recorded for property taxes in other years also include arrears.

The second point is that you should try to use the same categories for reporting revenues and expenditures that are used in the official accounting and reporting systems mandated by the central government in your country. This makes data collection much easier and allows you to compare your experiences to other local governments in your country.

In collecting revenue and expenditure data from government reports, one should be careful to distinguish between "budgeted" and "closed" accounts. The first refers to the amount of revenue or expenditure estimated at the beginning of a budget year. The latter refers to the actual amount accounted for at the close of the budget year. We want to use the actual, or closed account data in our analyses since it is more accurate than the budget estimates. In any event, we do not want to confuse the two sets of figures, since they are often quite far apart.

A final point on assembling revenue and expenditure data is the distinction between "constant" and "current" values of the local currency. Constant values include an adjustment for inflation and are intended to represent the actual purchasing power of an amount of money "deflated" to some past base year. Current values do not reflect any such adjustment. For example, an expenditure of $100 in 1984 may be expressed as $75 in 1980 constant dollars or as $100 in current dollars -- the amount recorded. This means that $100 in 1984 should purchase the same amount of goods and services that $75 would have purchased in 1980 (the base year).

The use of constant value accounts for inflation and provides a more accurate reading of changes in expenditures and revenues in terms of purchasing power. On the other hand, its use requires an additional transformation of recorded data, which is always recorded in current amounts. Furthermore, inflation estimates for some countries may not be very reliable, especially when inflation is high. For these reasons we have developed our analyses in this Handbook using current values with specific comparisons made against inflation rates rather than using

constant values which internalize adjustments for inflation. However, the analytical techniques presented can make equal use of revenue and expenditure data in constant values, if the reader so choses.

REVENUE DATA

Different countries allow local government different sources of revenue so there is no single list of revenue sources and categories. However, we can list a general set of revenue sources and describe the major categories that have proved useful across a number of different countries.

The first item to look for in revenue categories is those categories of revenue that are earmarked for special uses only and those that go to the general account, or fund, of local government. Special fund revenues should always be kept separate.

Figure 9 shows the major categories of revenue sources for local governments and the individual revenue sources that fall under each category. Some local governments have many individual sources of revenue, such as many different kinds of licenses, so it may be useful to group certain revenue sources together. A good number of categories of revenue sources for analysis is five to ten. You want to avoid having too few categories which makes it hard to see what is really happening; at the same time, too many categories keep you from seeing the major trends in the data.

The largest single sources of revenue should be treated as separate categories. The more minor sources may be aggregated into categories that have some common basis (such as "professional and business licenses" or "agricultural processing taxes"). Figure 10 shows a list of the categories of revenues that have been used most often in revenue analysis in developing country municipalities. This list is intended to be

Figure 9

Major Revenue Sources of Local Government
in Developing Countries

1. Local Taxes
   - 1.1 Real Property
   - 1.2 Personal Property
   - 1.3 Per Capita (Head)
   - 1.4 Business and Professional Services
   - 1.5 Sales
   - 1.6 Excise
   - 1.7 Income, or Graduated Personal Tax
   - 1.8 Agricultural Production/Processing
2. Licenses
   - 2.1 Occupational
   - 2.2 Vending
   - 2.3 Business Premises
   - 2.4 Vehicle
   - 2.5 Special Event
3. Patrimony
   - 3.1 Sale of Municipal Property
   - 3.2 Municipal Enterprise Profits
   - 3.3 Rent of Municipal Property
4. User Charges
   - 4.1 Betterment Levies
   - 4.2 Charges from Public Services Consumers
5. Other NonTax Revenues
   - 5.1 Fines
   - 5.2 Payment for Services to Higher Level Government
   - 5.3. Interest Income on Invested Cash
6. Central Government Transfers
   - 6.1 Shared National Taxes
   - 6.2 Formula Grants
   - 6.3 Ad Hoc Grants
7. Borrowing
   - 7.1 Long-Term Capital Investments
   - 7.2 Short-term Debt
   - 7.3 Local Interfund Borrowing

illustrative only -- individual local governments will have revenue categories that reflect their own situations.

Figure 10

Most Common Categories of Revenue Data

1. Property Taxes
2. Business Taxes
3. Other Local Taxes
4. Market Fees
5. Other License Fees
6. Utility User Charges
7. Central Government Grants
8. Borrowing
9. Miscellaneous (all other sources)

In collecting revenue data it is useful to draw up a data collection sheet which shows the revenue categories and the years for which you are collecting data. For categories of revenue that are aggregations of several individual revenue sources, you should note exactly what each category contains. Figure 11 provides a sample data collection sheet for local revenues to illustrate these points. The information needed to fill out such a sheet should be available from the local government treasurer's office. The same information is also usually reported to the central government ministry responsible for local government finance at least once a year. Therfore, data from past years can often be retrieved from the central government agency even if it has been lost at the local level.

Figure 11

Sample Data Collection Form, Philippine Ministry of Local Government

REVENUE & EXPENDITURE PROFILE WORKSHEET

Name of Municipality: _____
Year for Which Data is Collected: _____ (Round to Nearest Peso)
Person Preparing Worksheet: _____ _____

MDC

1 POPULATION ..... _____

GENERAL FUND

2 TOTAL GENERAL FUND REVENUES..... ₱ _____
3 TOTAL GENERAL FUND EXPENDITURES..... ₱ _____

GENERAL FUND PRINCIPAL REVENUE SOURCES:

TREASURER

4 Real Property Tax - current year..... ₱ _____
5 Real Property Tax - previous years..... ₱ _____
6 Real Property Tax - penalties..... ₱ _____
7 Business Tax..... ₱ _____
8 Residence Tax..... ₱ _____
9 Internal Revenue Allotment..... ₱ _____
10 Building Permits..... ₱ _____
11 Public Markets..... ₱ _____
12 Public Slaughterhouse..... ₱ _____
13 Public Utilities..... ₱ _____
14 _____..... ₱ _____
15 _____..... ₱ _____
16 _____..... ₱ _____

GENERAL FUND EXPENDITURES:

17 Assessor's Office..... ₱ _____
18 Treasurer's Office..... ₱ _____
19 Public Markets & Slaughterhouse..... ₱ _____
20 Public Utilities..... ₱ _____
21 100 Account: Personal Services..... ₱ _____
22 200 Account: Maintenance & Operation..... ₱ _____
23 300 Account: Capital Outlay..... ₱ _____

TREASURER

INFRASTRUCTURE FUND

24 TOTAL INFRASTRUCTURE FUND REVENUES..... ₱ _____
25 TOTAL INFRASTRUCTURE FUND EXPENDITURES..... ₱ _____

INFRASTRUCTURE FUND PRINCIPAL REVENUE SOURCES:

TREASURER

26 Specific Tax Allotment..... ₱ _____
27 National Aid..... ₱ _____
28 _____..... ₱ _____
29 _____..... ₱ _____

INFRASTRUCTURE FUND EXPENDITURES

30 100 Account: Personal Services..... ₱ _____
31 200 Account: Maintenance & Operation..... ₱ _____
32 300 Account: Capital Outlay..... ₱ _____

REAL PROPERTY TAX AS OF DECEMBER 31:

ASSESSOR

33 Taxable Valuation..... ₱ _____
34 Exempt Valuation..... ₱ _____
35 Municipal Tax Rate..... _____ %
36 Number of Taxable Parcels (land + buildings) _____
37 Number of Exempt Parcels (land + buildings). _____

NUMBER OF MUNICIPAL EMPLOYEES AS OF DECEMBER 31

TREASURER

38 General Fund Permanent..... _____
39 General Fund Temporary..... _____
40 General Fund Casual..... _____
41 Infrastructure Fund Permanent..... _____
42 Infrastructure Fund Temporary..... _____
43 Infrastructure Fund Casual..... _____

FUND TRANSFERS:

TREASURER

44 Excess SEF to General Fund..... ₱ _____
45 General Fund to Infrastructure Fund..... ₱ _____
46 Infrastructure Fund to General Fund..... ₱ _____

Rural Service Center Project, Ministry of Local Government 11/82

EXPENDITURE DATA

It is somewhat more difficult to describe expenditure data than revenue data since there is a great deal more variation in the way different governments report that information. Since we are collecting data as it is already recorded on official accounting or report forms, we normally have to use the categories dictated by each central government.

Generally, expenditure data are first categorized by different funds. Almost always there is a GENERAL FUND (for general expenditures of the local government) and several other special funds. Often there is a CAPITAL EXPENDITURES FUND for expenditures to construct major capital projects. Where there is a Capital Expenditures Fund, the General Fund usually is reserved for current operating expenditures, in which case it may be called the CURRENT ACCOUNT or OPERATING ACCOUNT.

Often there are separate funds for public services that are provided on a fee-for-service basis, such as water and sewer systems. This special fund accounting may keep together both capital and current operating expenditures for those separate services. In addition, local governments may keep records on expenditures broken down by administrative costs versus direct costs of providing individual public services. Finally, some accounting systems simply keep track of expenditures by category of expense, including salaries, materials, equipment purchase, and services purchased. In this case, the activity or program for which the expenditure is made may not be noted.

Loan repayment causes some problems in recording expenditure data, because such expenditures are often categorized differently by different local governments. For example, loan repayment may be considered a current operating expenditure, a capital expenditure, a special fund expenditure, or not recorded at all.

Figure 12 shows the major categories of expenditures that one is likely to encounter. Again, it must be stressed that the recording of data must be adapted to the kinds of data made available in local government records. Ideally, we would like to have data on total expenditures of each public service, on administrative costs of the local government, and capital versus current expenditures. In addition, it would be useful to have information on the expenditures incurred in collecting revenues, particularly the local tax collection and fee collection costs. If actual collection costs are not available, the next best type of information is the total expenditures of the office charged with tax collection.

As with the revenue data, we should draw up a data collection form for collecting expenditure data. The form should be similar to the revenue data collection sheet with the expenditure categories replacing the revenue categories (see the example in Figure 11).

2.3.2 Population and Inflation Estimates

We need estimates of total population within the boundaries of the local government's jurisdiction in order to calculate per capita rates for local revenues and expenditures. In addition, we also need to know how fast the population is growing to judge the growth of expenditures and revenues. In localities where a head tax is collected, it is also useful to know the size of the adult population from which the tax is collected.

In cases where population growth rates or population estimates are not available for individual municipalities, we must use regional or national estimates. If population growth rates are available for urban and nonurban areas as a group, we can make use of those as well. Figure 13 provides an example, showing how we would estimate a growth rate for a local government based on national population growth rates.

Figure 12

Common Expenditure Categories for Local Governments

Program Area	Current Expenditures				Capital Exp.*	Debt Service*
	Personnel	Materials	Utilities/ Fuel	Services		
Administration						
Departments						
Health						
Water/Sewer						
Roads/Bridges						
Housing						
Education						
Fire						
Health/Sanitation						
Parks/Recreation						
Markets/Slaughterhouses						

* May not be assigned to individual departments

Figure 13

Estimating Municipality's Population Growth
Using National Estimates

STEP 1: ESTIMATES OF (A) PAST POPULATION SIZE OF MUNICIPALITY AND (B) POPULATION GROWTH RATES.

(A) In the 1975 census, the municipality had a population of 300,000 persons with one third living in the urban area and two thirds living in the rural areas.

(B) Recent figures for national population growth show a 3 percent increase for rural areas and a 5 percent for urban areas, nationwide.

STEP 2: DEVELOP CURRENT POPULATION ESTIMATE FOR MUNICIPALITY

The rural population of the municipality was 200,000 persons in 1975 and should have grown at 3 percent per year. Therefore, rural population is increased by 3 percent each year. The urban population was 100,000 in 1975 and should increase by 5 percent each year. The following table shows the total population increase by year.

	1975	1976	1977	1978	1979	1980
Rural	200,000	206,000	212,180	218,545	225,102	231,855
Urban	100,000	105,000	110,250	115,762	121,551	127,628
Total	300,000	311,000	322,430	334,307	346,653	359,483

Compound growth rate, 1975 to 1980 = (359,483 - 300,000) ÷ 300,000 = 19.8%

In addition to population estimates, we also need estimates of inflation on a year-to-year basis. These estimates should cover the same years as the revenue and expenditure data. As mentioned above, simple estimates of inflation can be used to adjust revenue and expenditure data to constant values. However, for purposes of this Handbook, we will use only the simple inflation rate estimates and not carry out the constant value transformations here.

2.3.3 Additional Information From Special Studies

In addition to the types of information listed above, we can make use of data commonly found in studies of housing, income, urban development and economic activity. This information falls into two categories:

- Data used to estimate the revenue base of local government
- Data used to compute measures of municipal service delivery efficiency.

For the first type of information, we are interested in data that allow us to estimate the number, or amount, of items on which taxes are collected. For example, it is useful to know the number of households in a municipality in order to estimate the number of houses on which property tax is collected. In addition, other special studies that may have been carried out in the local community can provide additional useful information on

- Average costs of housing (either value of property or rental paid)
- Amount of agricultural production (if an agricultural tax is collected)
- Municipal properties

- Amount of livestock (if a livestock tax is collected) and

- Number of business establishments (by types which serve as basis for a tax, e.g., number of hotels, restaurants).

The reason for collecting this type of information is to have a basis for estimating the Revenue Base for any given tax or license fee. For example, knowing the number of business establishments can be used to project the number of business licenses that should be issued. Even if the precise number for a specific municipality is not known, we can use national estimates. For example, if we know that there are 1.5 automobiles for every ten people in the country, we can form a reasonable estimate of how many automobiles there should be in a city of a given size.

Information on municipal service delivery is used to develop measures of service efficiency. For this type of analysis, we need data on amount of services delivered and number of households covered. It is also useful to have data on the number of persons employed in delivering specific services, such as the number of employees in the local water department.

Figure 14 provides a list of types of data from these special studies that one should try to collect.

2.3.4 Comparative Revenue and Expenditure Data for Other Municipalities

Comparative data from other local governments is very useful in financial analysis as a standard against which to measure your own performance. Information is often compiled by one of the central ministries on revenues and expenditures of local governments for each fiscal year. This information may be published in report form or it may simply be kept on file for internal use.

Figure 14

Data Collected from Special Studies

1. Information for Estimating Revenue Base

Number of households

Total number of properties

Number and type of business establishments

Amount of personal property
(automobiles, bicycles, livestock)

Amount of agricultural production and processing

Average personal, or household, income

Percentage of income devoted to housing

Average cost of house construction

Average rent of housing

Amount of municipal-owned property

2. Information for Estimating Municipal Service Measures

Amount of service delivered by agency
(e.g., amount of water pumped)

Number of households served by each municipal service

Number of persons employed in each service agency

This type of information may not be in just the right form to allow you to make all the comparisons that you would like. However, there are many types of comparative analyses that can be made and that are presented in the chapters below. The important point that should be made here is that any comparative information can be of great use; we should take it in almost any form that we can find it.

2.3.5 Note on Definition of Terms

The glossary included in the appendix to this Handbook contains definitions of the main terms used in the text. Special note should be made of the usage of three common terms: Taxes, Fees, and Charges.

Taxes are levies applied on items of property, on sales of property, on services, and on persons. Taxes may be applied on a percentage of value basis or on a flat rate. Fees are distinguished from taxes in that fees apply to the granting of a license for permission to engage in some regulated activity. Fees are usually applied on a flat rate basis. Charges refer to revenues received from consumers of public services in exchange for the service. Charges may be applied on a flat rate basis, but are more commonly based on amount of consumption.

These three terms are often used with varying meanings in other written works on local government finance. However, we will adhere to the definitions cited above in the following text to avoid confusion.

A note should also be made on the use of the terms MUNICIPALITY and LOCAL GOVERNMENT. For purposes of this Handbook, the two terms are used interchangeably. Both terms denote a distinct local authority that is mandated to provide public services and is empowered to raise local revenues.

CHAPTER 3
REVENUE ANALYSIS

Chapter Overview

This chapter is divided into two major parts. The first part presents techniques for analyzing financial data of a single municipality or local government. The second part describes techniques for analyzing data across a group of municipalities. Even if you are interested in only one type of analysis, you are encouraged to read both sections. The techniques presented in each section reinforce each other and add to the reader's understanding of the principles underlying revenue analysis in general.

The major topics covered in the chapter include

3.1 SINGLE-CASE ANALYSIS

3.1.1 Overall Revenue Composition and Trends

- Constructing an overview analysis
- Changes in importance of different revenue sources over time

3.1.2 Analysis of Performance of Individual Revenue Sources

- Property tax performance
  -- components in the property tax system
  -- common patterns in property tax yield
  -- tax base estimating techniques
- Analyzing the year-to-year growth in property tax revenues
- Head tax revenue performance
  -- calculating collection efficiency

-- assessing performance of other population-based taxes

- License fee revenue performance
  -- impact of rate changes on revenues
  -- measuring compliance

- User charge revenue performance
  -- measuring collection and billing efficiencies
  -- cost recovery ratios
  -- calculating revenue per unit of service
  -- estimating subsidies required by revenue shortfall

3.2 COMPARATIVE REVENUE ANALYSIS AMONG MUNICIPALITIES

3.2.1 Standardizing Group Data

- Developing per capita measures

3.2.2 Trend Analysis of Comparative Data

- Identifying underlying trends
  -- using "moving averages" technique
  -- using linear regression technique

3.2.3 Revenue Performance Comparisons

- Trend comparisons
  -- using group data to analyze single city performance

- Revenue potential analysis
  -- setting revenue targets
  -- determining revenue potential by revenue source

3.2.4 Projecting Future Revenue Trends

- Extrapolating from past trends

- Determining alternative scenarios using revenue potential analysis

- Setting upper and lower bounds on future revenue expectations

3.1 Single Case Analysis

This section presents techniques for analyzing data from a single municipality or local government. Here the techniques emphasize analysis of year-to-year changes in revenue collections of the local government. The first part of this section focuses on the overall composition of revenues, changes in that composition over time, and the trends among the different revenue sources. The second part of this section concentrates on analysis of the individual revenue sources, presenting differing techniques which are useful for the different types of revenues.

3.1.1 Overall Revenue Composition and Trends

This analysis provides a quick overview to identify which revenue sources are most important and what is happening to those revenues over time. In this section we will use case study materials from a local government in northern Ghana over the period of Fiscal Year (FY)1979 through FY1982.

Figure 15 presents the total revenues by category for the local government for the four year period. Also shown are the percentages of the total revenues that each category of revenue sources provides.

Figure 15 shows the following information about what is happening with respect to overall revenue composition and trends:

- Central government grants have fallen greatly in importance as a local revenue source (from 39 percent to 18 percent of total revenues)
- Local taxes have risen in importance to almost 40 percent of the local total revenues
- Market-related fees are now the single largest source of income, having gone from 19 percent of total revenues to 29 percent in the four-year period and

Figure 15

West Dagomba District Council Revenue Sources
Actual Collection Amounts (cedi)

Revenue Category	FY 79		FY 80		FY 81		FY 82	
Taxes (Total)	214,736	32%	471,336	36%	407,842	30%	663,901	39%
Head Tax	132,494		280,777		163,910		357,473	
Property Tax	51,738		138,790		169,716		194,074	
Cattle Tax	19,242		30,719		47,190		65,825	
Bicycle Tax	11,262		21,050		27,026		46,529	
Fees (Total)	168,934	25%	264,434	20%	462,961	34%	581,796	34%
Market Related	127,122		211,908		405,471		490,811	
Agric. Production	10,743		16,378		27,583		55,866	
Sanitation	14,280		12,642		14,593		17,606	
Other	16,789		23,506		15,314		17,513	
Licenses (Total)	16,289	02%	39,961	03%	50,174	04%	110,724	07%
Occupation	3,852		9,391		6,704		56,866	
Transport	5,441		10,034		17,233		18,588	
Food/Drink/Hotel	5,948		14,336		23,677		31,065	
Other	1,048		6,200		3,100		4,205	
Central Government Grants	260,117	39%	508,566	39%	422,485	31%	303,846	18%
Miscellaneous	12,673	02%	17,107	01%	14,995	01%	41,229	02%
Total	672,749		1,301,404		1,356,997		1,701,496	

NOTE: All figures shown are in current cedis. No reliable estimates of year-to-year inflation are avaliable for the study period with which we can develop constant cedi estimates.

- Revenues from license fees have tripled in importance, with a particularly dramatic rise in the occupation licenses.

This summary analysis reveals the rising importance of revenue sources tied to economic activity in the community and a general lessening of dependency on external sources of revenue.

Over the time period, total revenues have increased about 250 percent. At the same time, Ghana has experienced very high rates of inflation, averaging 90 percent per year during the same time period. This means that the revenue increases have not kept up with inflation. Therefore, in terms of the constant value of the currency, the local government has less purchasing power in 1982 than it had in 1979.

During the time period, the total population of the West Dagomba District has been growing. Since tax and fee revenues should go up as population increases, we should examine the per capita revenue collections as well. Figure 16 shows the per capita revenue amounts for 1979-82. The per capita amount is derived by simply dividing the revenue amount by the population estimate for that year.

Figure 16 shows a three-fold increase in local taxes and fees, while license fees per capita rose more than six times. The increase in local taxes was spread fairly evenly across all four types of taxes, with the head tax continuing to be the major tax source.

Market-related fees continued to be the major source of fee revenue, having risen about 350 percent over the four-year period. Among the categories of licenses, the occupation license revenues grew almost fifteen-fold, accounting for one half of license revenue in FY82.

Central government grant funds per capita fluctuated considerably, ending in FY82 at about the same level that they were in FY79. Since inflation

Figure 16

Per Capita Revenue Collections, West Dagomba District
(cedis)

Revenue Category	FY79	FY80	FY81	FY82
Taxes (Total)	1.75	3.74	3.13	4.95
Head Tax	1.08	2.22	1.26	2.66
Property Tax	.42	1.10	1.30	1.44
Cattle Tax	.15	.24	.36	.49
Bicycle Tax	.09	.16	.20	.34
User Charges (Total)	1.38	2.09	3.56	4.34
Market-Related	1.04	1.68	3.12	3.66
Agricultural Production	.08	.12	.21	.41
Sanitation	.11	.10	.11	.13
Other	.13	.18	.11	.13
Licenses (Total)	.13	.31	.39	.82
Occupation	.03	.07	.05	.42
Transport	.04	.07	.13	.13
Food/Drink/Hotel	.04	.11	.18	.23
Other	.00	.04	.02	.03
Central Government Grants	2.12	4.03	3.25	2.26
Miscellaneous	.10	.13	.11	.30
Total	5.50	10.32	1.46	12.70

Note: All figures shown are in current cedis. No reliable estimates of year-to-year inflation are available for the study period with which we can develop constant cedi estimates.

was so high during the period, this constitutes a tremendous drop in the real contribution of the central government to local revenues.

The analysis of changing revenue composition and changes of per capita revenues over time provides a very useful overview of the revenue situation of a local government. This overview tells us

- The changing importance of local versus national sources of revenue over time
- The changing importance of individual revenue sources and
- The growth of revenues (adjusted for population growth on a per capita basis) measured against the growth in inflation.

3.1.2 Analysis of Performance of Individual Revenue Sources

Once we have an overview of the total revenue composition and trends, we turn our attention to analyzing the performance of individual revenue sources. There is considerable variation in revenue sources that local government may command. Descriptions of the most common ones are presented in the glossary located in the appendix to this Handbook. For our presentation of revenue analysis techniques in this section, we have selected four types of revenue sources:

- Property tax
- Per capita (head) tax
- License fees
- Service user charges.

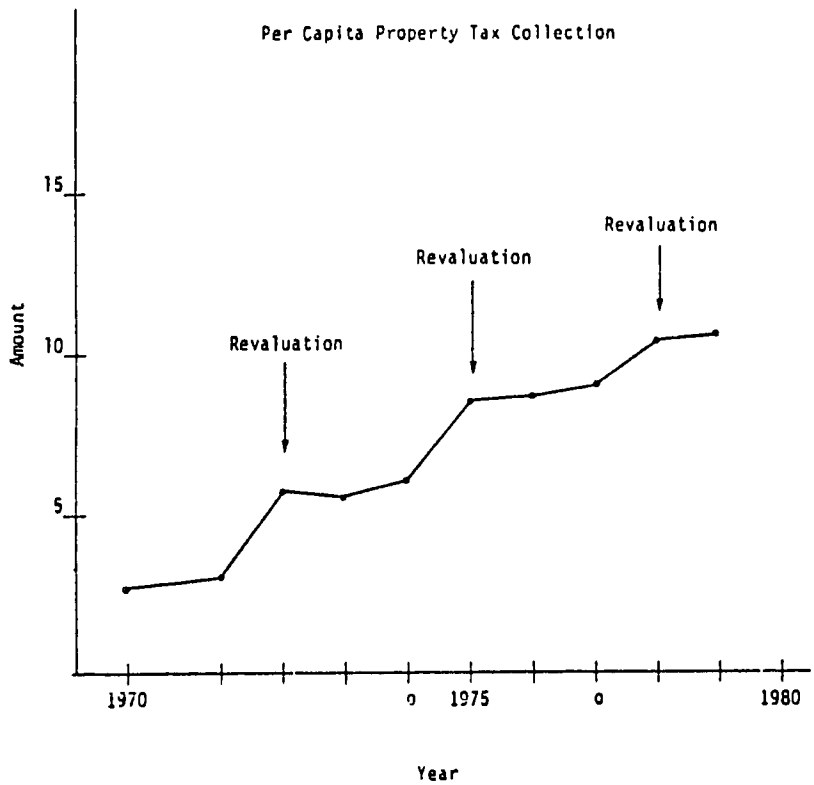
PROPERTY TAX REVENUE PERFORMANCE

There are several different systems for levying property taxes that affect the types of analyses that can be used. The major distinction is between property tax systems based on rental value of property and systems based on market, or sale, value of property. However, for some types of analyses dealing with trends in property tax revenue growth, the distinction between the different valuation systems makes no difference. Only in the analytical techniques dealing with estimates of the tax base is the difference between the two systems critical; in that case, alternative methods for estimating the tax base are presented.

In examining property tax performance it is important first to understand the particular pattern that property tax collections tend to follow. Figure 17 shows the typical stair-step pattern normally found in property

tax collections over several years. The pattern is caused by periodic revaluation of properties which causes the total assessment to jump dramatically in the year following the revaluation.

Figure 17



Also typically, the collection efficency tends to fall after a revaluation since some property owners protest the amount of revaluation and others simply avoid paying the increase. However, although the collection effciency might fall, since the valuation base is so much higher, total amount of taxes collected will usually increase significantly.

There are two major problem areas in property tax administration: (1) property listing and valuation and (2) tax collection procedures. Since local governments can only collect tax amounts that are recorded on the tax

rolls, poor listing and valuation practices limit the effectiveness of even the best collection procedures. Figure 18 shows the steps in the property tax system and the relationship of listing valuation and collection procedures to tax yield. The example in the figure shows the impact of poor valuation efficiency on total yield.

The example in Figure 18 shows a collection efficiency of 22.2 percent, meaning that only 22 percent of what should have been collected in property taxes was actually realized. Because all procedures in the tax system are never 100 percent efficient, we would expect a collection efficiency somewhat less than 100 percent. However, in many developing countries, efficiency rates for local property taxes of 25 to 40 percent are common, meaning that considerable improvement is possible within the existing rate structure.

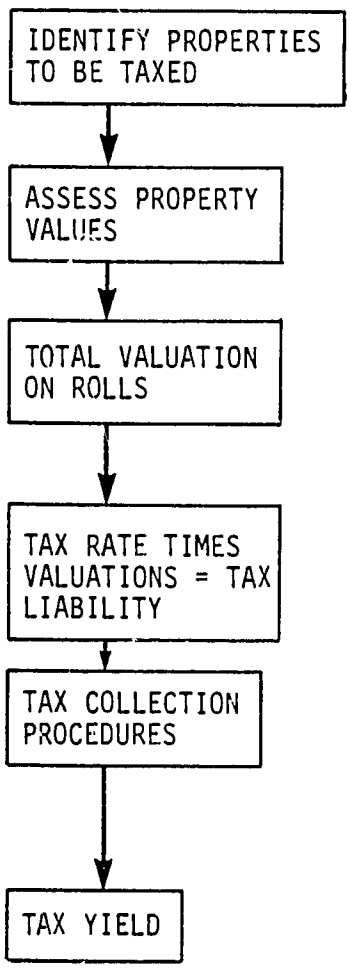
There is no fixed rule about whether a given level of collection efficiency is high or low. As shown in the Section 3.2, Comparative Revenue Analysis Among Municipalities, the best way to judge the performance of an individual municipality is to compare it to other similar municipalities in the same country.

The key to analyzing property tax performance for a single municipality is to have a good estimate of the tax base -- that is, the total value of all property on which the tax is levied. As shown in Figure 18, the valuations recorded on the tax rolls may not be a good estimate of the true tax base if the tax rolls are not complete or if the property valuations are not accurate or up to date.

There are three ways to estimate the value of taxable property, depending on the type of property tax system and the type of information available. It must be kept in mind that these techniques give us ESTIMATES of the value of property, not a precise measure. However, these estimates can be used to check the recorded valuation on the tax rolls. They can reveal

Figure 18

Components of Property Tax Collection Systems
and Example Showing Impact of Inefficiencies



Property Tax System Components	Example: Real Situation	Example: As Carried Out
IDENTIFY PROPERTIES TO BE TAXED	There are 12,000 taxable properties in city	Only 8,000 properties are recorded on tax rolls
ASSESS PROPERTY VALUES	Average value of each property is $3,000	Assessment records an average value of $2,000
TOTAL VALUATION ON ROLLS	Total valuation: should be $36,000,000 (number of properties times average value)	Actual valuation is $16,000,000
TAX RATE TIMES VALUATIONS = TAX LIABILITY	Total liability should be 3% x $36,000,000 or $1,080,000	Recorded liability is 3% x $16,000,000 or $480,000
TAX COLLECTION PROCEDURES	If collection efficiency is 100%, tax collection should equal tax liability	Actual collection efficiency is 50%
TAX YIELD	Yield should be $1,080,000	Actual yield = $240,000

Total efficiency of Tax Collection = Amount Collected ÷ Real Liability
= $240,000 ÷ 1,080,000
= 22.2%

very quickly whether property valuation is too low and how much improvement can be made. The three methods are termed

- Baseline Projection
- Cost Projection
- Income Profile Projection.

The BASELINE PROJECTION technique is used when you have a reasonably good estimate of property valuation at some point in the past and can use that estimate as the basis for estimating current values. For example, if a cadastral survey was completed at some time in the past, giving reasonably good information on property characteristics and values, that may be used as the baseline.

In order to project the baseline data forward to the present, we assume that (1) the total amount of taxable property has increased in proportion to the population growth and (2) the value of property has increased in proportion to the rate of inflation. Therefore, to carry out the projection, we need to know what the population rate increase has been and what the inflation rate has been in the years since that baseline valuation estimate.

Figure 19 shows how the calculation of a current estimate can be made using the Baseline Projection technique. Since this technique is used to estimate total tax base using past valuations, it can be applied to either rental value tax systems or market value systems.

The COST PROJECTION technique is used for estimating the tax base for market- value-based property tax systems in which residential housing is the major component of the property tax base. The underlying principle is quite simple: we try to estimate the total value of the housing stock and

Figure 19

Calculation of Property Valuation Using
Baseline Projection Technique

STEP 1. CALCULATE GROWTH IN NUMBER OF PROPERTIES

EXAMPLE: 1975 is our base year, when a cadastre survey recorded 13,250 properties with a valuation of $26,500,000 or $2,000 per property. If population growth is 4% per year, we assume that the number of properties is growing at 4% per year also. Therefore, in 1976 the number of properties is:

$$13{,}250 + .04 \times (13{,}250) = 13{,}780;$$

Each year it increases 4%, giving us:

year =	1976	1977	1978	1979	1980
number =	13,780	14,331	14,904	15,500	16,120

STEP 2. CALCULATE INCREASE IN VALUE

The average property value in 1975 was $2,000. We assume that property values are growing at the same rate as the inflation rate, which was 15% per year from 1975-1980. Therefore, average value increased 15% per year, giving us an average value in 1976: $2,000 x .15 (2,000) = $ 2,300.

year =	1976	1977	1978	1979	1980
value =	2,300	2,645	3,042	3,498	4,023

STEP 3. CALCULATE TOTAL VALUATION IN 1980

Total valuation in 1980 = 16,120 properties x 4,023 (average value) = $64,850,760.

then, where possible, estimate other, nonhousing property value as a proportion of the housing valuation.

This technique is most useful when we suspect that the tax rolls greatly understate the total tax base. The technique can be used when you have information on the average cost of housing, the number of housing units, and some idea of the proportion of valuation of housing to valuation of other (commercial) taxable property. This calculation involves a two-step process in which (1) the value of residential property is estimated by multiplying the number of housing units times average cost of housing, and (2) calculating the amount of nonresidential property value as a proportion of the residential value determined in (1) above.

The information on housing costs and number of housing units may be found in studies of housing or, occasionally, general economic assessments. Once you know what data to look for, the information is usually available in some form. Figure 20 shows how the Cost Projection calculation is made.

The INCOME PROFILE PROJECTION is most useful for tax systems where the property tax is computed on the rental value of property, particularly the rental value of residential property. It is particularly useful in situations where we suspect that the tax base is greatly understated on the tax rolls.

This technique uses data on income profiles of the population and proportion of income devoted to housing to estimate total rental value of the residential housing stock. The technique can also be used to calculate the market value of property if a rent multiplier (ratio of amount of rent to value of property) is known. Figure 21 shows how the Income Profile Projection calculation is made.

The three techniques differ mainly in the information used to estimate the tax base of the property tax. The Baseline Projection technique assumes

Figure 20

Calculation of Property Valuation
Using Cost Projection Technique

STEP 1. ASSEMBLE DATA ON (A) NUMBER OF HOUSING UNITS, (B) AVERAGE COST PER UNIT, AND (C) PROPORTION OF TOTAL PROPERTY TAX COLLECTED FROM RESIDENTIAL HOUSING

(A) A survey in the municipality revealed that there are 10.5 persons per household in the municipality of 262,500 people. This means that there are approximately 25,000 housing units.

(B) The survey also revealed that dwelling units averaged 45 square meters and that market value was $20 per m^2. Therefore, each unit has an average value of $900 (45 m^2 x $20/$m^2$).

(C) From an examination of property tax collection records, we see that collection from residential property account for 65% of all property tax valuations.

STEP 2. ESTIMATE TOTAL VALUE OF HOUSING

Total value of housing = number of houses times average value, or 25,000 x $900 = $22,500,000.

STEP 3. ESTIMATE TOTAL PROPERTY VALUATION

If residential property accounts for 65% of total valuation (TV), the .65 x TV = 22,500,000, or TV = $34,615,384.

Figure 21

Calculation of Property Valuation Using
Profile Projection Technique (Rental Value)

STEP 1. ASSEMBLE DATA ON (A) PROPORTION OF INCOME DEVOTEL TO HOUSING, (B) TOTAL INDIVIDUAL HOUSEHOLD INCOME, (C) PROPORTION OF TOTAL PROPERTY TAX COLLECTED FROM RESIDENTIAL PROPERTY

(A) A recent national housing study revealed that 18% of household income is devoted to housing costs (excluding heating and utilities); almost all of this is rent, or mortgage, costs.

(B) Another study revealed that per capita income is $800 and that there are 7.5 persons per household, meaning that average household income is $6,000 per year.

(C) The proportion of the local property tax accounted for by residential properties is 80%.

STEP 2. CALCULATE TOTAL RENTAL VALUE OF HOUSING

If there are 250,000 persons in the municipality and average household size is 7.5 persons, the number of households = 33,333. If rent equals 18% of income, average household rent = .18 x 6,000 = $1,080 per year. Total rental value = 33,333 x $1,080 = $35,999,640.

STEP 3. CALCULATE TOTAL PROPERTY VALUATION (RENTAL VALUE)

If housing accounts for 80% of property valuation, the .80 x total valuation (TV) = 35,999,640, or TV = $44,999,550.

that we have a reasonably good estimate of the tax base for some point in time in the past. The other two techniques use independent estimates of the housing stock to determine what the size of the tax base should be.

It should be kept in mind that all of these techniques provide fairly rough estimates of the value of property, not precise determinations. However, the problems of undervaluation and poor collections are so severe in most municipalities that even rough estimates provide good starting points.

The objective of each of these techniques is to determine the approximate size of the property tax base. Knowing what the tax base is can help you

- Assess the accuracy of current listing and valuation practices and the accuracy of the total valuation on the property tax rolls and
- Determine how much additional tax could be generated from improving valuation practices.

Once the tax base can be estimated, the collection efficiency of the property tax can be calculated. This is a simple technique, requiring only that the amount of property tax collected be compared to what is estimated to be the tax potential. Below we present a case study in which all of the steps of estimating the tax base, collection efficiency and revenue shortfall are combined.

CASE STUDY: Property Tax Analysis

This case study is based on a larger study of local revenue-raising potential of the West Dagomba District Council (W.D.D.C.) of Ghana conducted by James S. McCullough and Emmanuel Dorsu in 1982. This case focuses on the property tax valuations and collections of the district. The property tax system is based on assessed market value of buildings and improvements; it includes private residences and private commercial buildings. Land, which is tribally owned and vested in the state, is not traded at market value and is not valued for the property tax.

Figure 22 summarizes the major facts available from the local tax records in 1982.

Figure 22

Information from W.D.D.C. Tax Rolls, 1982

Category	Number of Properties	Total Valuation	Tax Rate
Residential	5,498	¢6,195,472	0.04 per ¢1.00 valuation
Commercial	343	¢1,032,579	0.105 per ¢1.00 valuation

Total Property Tax collected in 1982 = ¢194,074

If we multiply the valuations by the tax rates, we have a total tax liability of 356,240 cedis (¢), compared to an amount collected of ¢194,074. This gives us a collection efficiency of 54.5 percent.

We are also interested in estimating the size of the tax base by some independent means in order to see if the valuation totals on the tax rolls are reasonable. To do this, we will use the Cost Projection technique since we also have data on housing characteristics in the district from a study conducted in 1980.

The housing study revealed that there were 6,989 housing units in the district in 1979 and that the average cost of building a modest house was about ¢6,400. We also know from some population data that the population growth rate in the district is about 3 percent per year, so we can project a similar growth in the housing stock during the period from 1979 to 1982.

From this data, we can calculate that there are about 7,637 dwellings in 1982. (We will not assume any increase in valuation per dwelling from 1979 to 1982 since property is mandated to be revalued every five years.) If we multiply the number of houses by the average value of ¢6,400 per dwelling, we have a total value of the housing stock of ¢48,876,800. This is about eight times the valuation recorded on the tax rolls in 1982. If we assume a similar shortfall in the recording of commercial property, we have an estimated total property tax liability of ¢57,022,935.

The huge difference between the estimate based on the Cost Projection technique and the amount recorded on the tax rolls indicated that further investigation was required. Is the shortfall produced by omitting properties from the tax rolls or in undervaluing the properties on the rolls? A subsequent analysis suggests that both are occurring. The projection of number of housing units indicates that there are 7,637 houses, while the tax rolls show only 5,498. However, by adding the

difference, we would increase the number by only about 40 percent. The main cause of the shortfall must, therefore, be in the valuation practices.

An investigation into the causes of the shortfall did reveal that approximately 2,000 residential properties had been valuated by the tax office but had not been added to the tax rolls because of an administrative mistake in the Valuation Office. Furthermore, it was discovered that the periodic revaluations to bring valuations up to current market value had not been carried out since 1970. Consequently, the tax rolls had many properties with very low valuations. Since the period 1970 to 1982 was a period of very high inflation, the lack of revaluation was costing the local government a tremendous amount in lost tax revenues.

In summary, an analysis of the property tax data of the West Dagomba District Council showed very quickly that the local government had three major problems with the property tax system:

- The valuation of property on the rolls was much too low because of lack of scheduled revaluations.
- The tax rolls were missing over 2,000 properties on which no tax liability had been applied.
- The collection efficiency on outstanding tax liability was low at only 54.5 percent.

Clearly, the local government could raise property tax revenues several times without having to raise tax rates. In FY82, the property tax accounted for about 11.5 percent of total revenues of the district government. From our analysis, it appears that there is no technical reason that this proportion should not be increased to 25 to 30 percent.

In retrospect, the problems of the property tax system should have been obvious to local officials. However, the fact that responsibility for different components of the tax systems is spread across several agencies kept any one official from having an overview of total system performance.

It was not until the foregoing analysis was conducted in 1983 that the magnitude of the shortfall in tax yield was made evident to the local district administration.

ANALYZING YEAR-TO-YEAR GROWTH IN PROPERTY TAX REVENUES

The performance of the property tax can be evaluated even if you are not able to estimate the potential tax base. We use a technique, which we term EXPECTED GROWTH ANALYSIS, to determine how much revenues should have increased over a set time period, given (1) the amount collected in the past, (2) some assumptions about growth in population and inflation, and (3) changes in the tax rates. It is very similar to the Baseline Projection Technique described above and uses the same information.

This technique tells us how well we are doing on collection efficiency COMPARED TO THE PAST. It cannot tell us how well we are doing compared to the potential tax base. However, it is very useful in helping to judge if performance is improving or declining.

The underlying principle in Expected Growth Analysis is that property tax revenues <u>should</u> grow at a rate equal to the growth in the number of properties and the growth in the value of properties. Furthermore, we assume that (1) the growth in numbers is about the same as the growth in population, and (2) growth in value is equal to the rise in inflation. These assumptions may not be entirely accurate, but for our purposes of rough estimation, they are sufficient.

To illustrate how we carry out this analysis, we will use the data for City X presented in Figure 23. The figure shows the property tax revenues for the period 1979 through 1982 as well as the tax rate, inflation and population growth rates. Note that the tax rate increased 33 percent in 1981, going from 3 percent of valuation to 4 percent.

Figure 23

Recorded Property Tax Collections and
Population Growth and Inflation Estimates
for City X, 1979-1983

	1979	1980	1981	1982	1983
Property Tax Collections	75,000	78,000	87,480	104,976	106,320
Tax rate (Percent of valuation)	3%	3%	4%	4%	4%
Population growth rate	5%	5%	5%	5%	5%
Inflation rate (increase from previous year)	10%	10%	15%	20%	15%

Figure 24 takes the data from Figure 23 and estimates the expected growth in property tax revenues, using 1979 as the base year. That is, we use the 1979 revenue total as the starting point and increase it in proportion to the population rate and inflation rate for each of the following four years.

To understand fully how the property tax should perform, we should recall the earlier discussion of the stair-step pattern in property tax collections caused by periodic revaluations. The periodic revaluation means that property is not assigned its true market value every year, but only every several years (at the time of revaluation). Consequently, property valuations should remain constant for the period between valuations and then jump to the real market value at the time of

Figure 24

Calculation of Expected Growth in Property Tax Collection for City X, 1980-1983

	1980	1981	1982	1983
Increase in number of properties on rolls	5%	5%	5%	5%
Actual annual growth in property values due to inflation	10%	15%	20%	15%
Recorded growth in property values due to revaluation	0%	0%	51.8% 1/	
Recorded growth in total revaluation	5%	5%	59.4% 2/	5%
Added growth due to rate increase	0%	33%	0%	0%
Total increase in tax liability expected from previous year 3/	5%	39.65%	59.4%	5%
A. Estimated collections 4/	78,750	109,974	175,299	184,064
B. Actual collections (from Figure 23)	78,000	87,480	104,976	106,320
Difference (A - B)	750	22,494	70,323	77,744

1/ Compound increase in value over previous three year period

2/ Compound increase of property value increase times growth in number of properties

3/ Percentages are compounded (multiplied together)

4/ Multiply previous years estimate by total increase factor; example: Estimated collections in 1981 = 78,000 + .3965 x (78,000) = 109,974.

revaluation. The amount of the increase in value is the accumulation of three years' rise in inflation. The only increase in total valuations of all property in the period between revaluations is caused by new properties being added to the tax rolls.

Figure 24 shows that the total valuation of property in City X grows by new additions to the property rolls every year in direct proportion to population growth. Total valuations also increase by the accumulated jumps in market value every three years, which is assumed to be equal to the inflation rate in our analysis. In our example in Figure 24, 1982 is the revaluation year. The total liability also increased in 1981 due to the tax rate increase.

The results in Figure 24 show that collection efficiency has been falling since 1979, although the amount of taxes actually collected has been increasing every year. Figure 24 also shows how we can estimate the difference between what City X actually collected and the amount we estimate that it should have been able to collect. Keep in mind that this is the difference that it should have collected, <u>if it were doing as well as it did in 1979</u>. From our example, it is clear that the city is losing a great deal of revenue that, in terms of past performance, it ought to be collecting.

The size of the shortfall suggests that City X might do well to invest in improving collections. It would appear that there is enough revenue to be regained through improved collections to pay for some increased collection activity.

It must be kept in mind that this type of analysis can only compare present to past performance; it will not determine how much of the true tax base is being collected. To do that, we have to have an estimate of the tax base itself.

This type of analysis can be used to assess the growth in any revenue source that is tied to population and/or inflation growth. For example, revenues from any type of personal property tax should grow as population and inflation grow. This would also include sales taxes and business taxes linked to the value of sales or services.

HEAD TAX REVENUE PERFORMANCE

The head tax, or per capita tax, is a very simple tax that may not appear to warrant much attention in a handbook such as this one. However, for many local governments, it represents an important revenue source. Furthermore, the analysis of head tax performance can be applied to any other type of local tax that can be tied to population estimates.

The head tax is usually levied on each adult in the jurisdiction. In some cases, it may carry different rates for men and women or persons in different occupational classes. Since the base for the tax is the adult population, the tax base can be estimated if we know the number of people in the jurisdiction.

To illustrate how we deal with the head tax analysis, we will use a case example from the West Dagomba District in Ghana. We will use the head tax revenue data from Figure 15, covering the years FY79 to FY82. Figure 25 shows how we would analyze the data to estimate the collection efficiency. Note that the analysis takes into account the growth in population and the change in the tax rate over the time period.

The analysis is quite simple. First, we assemble the information on total tax receipts and tax rates. Then we divide the amount of revenue by the tax rate to obtain an estimate of how many persons paid the tax in each year. We then compare this to the population estimate to see what the collection efficiency is for each year.

The collection efficiency shows a sizable variation in the percentage of people paying the tax from year to year. The highest collection efficiency was realized in FY80 when 89.1 percent of the tax base was collected. Although more money was collected in FY82 than in FY80, that increase was caused by an increase in the tax rate. The figure shows that less than 60 percent of the population paid the head tax in FY82.

Figure 25

Head Tax Collection Performance,
West Dagomba District Council

Year	Total H. T. Revenue Collected	Average Rate	Number of Payees	Est. Tax Paying Pop. [1/]	% Paying of Total Pop.
	A	B	C=A/B	D	E=C/D
FY 79	132,494	¢2.50	52,998	122,210	43.4%
FY 80	280,777	¢2.50	112,311	125,998	89.1%
FY 81	163,910	¢2.50	65,564	129,904	50.5%
FY 82	357,473	¢4.50	79,438	133,931	59.3%

The reason for the high collection efficiency obtained in FY80 was a special tax collection campaign involving a house-by-house canvass of the district. Was the campaign worth the expense? Figure 26 shows a calculation of the costs of the campaign and an estimate of what could have been collected in FY82 if the collection efficiency of FY80 had been maintained. The figure shows that the additional ¢180,000 which could have been collected is much greater than the expenses of the collection campaign, producing a large net revenue for the local government.

This type of analysis can also be applied to other types of revenue sources that can, in some manner, be related to population numbers. Consider an example in which we have a tax on bicycles. If we know from a past study that there are 3.5 bicycles per household and that urban households have an average of 10.5 inhabitants each, we can readily estimate that a city of 150,000 people should contain one bicycle for every three persons, or 50,000 bicycles. If the tax rate is $0.50 per bicycle, the tax base is about $25,000 for that city.

Other taxes that can be treated in the same manner as the bicycle tax example above include

- Personal property
- Automobiles
- Livestock
- Resident tax.

Figure 26

Calculation of Additional Revenues Which Could Be Collected Through Special Campaign, FY 1982

In FY 1980, the cost of the special collection campaign which collected ¢210,000 in six weeks was a 10% "bounty" paid to the collectors, or ¢21,000. The amount collected in the special campaign amounted to about 75% of the total head tax collected for the year.

If the collection efficiency in FY 1982 were 89.1%, then the number of persons who would have paid = .891 x 133,931 (1982 population estimate) = 119,333. Then, the total which would have been collected, would equal:

119,331 persons at ¢4.50/each = ¢536,998.50

If the special collection campaign would account for 75% of the total, then the campaign would collect ¢402,749 (75% of 536,998). If the campaign costs 10% of total collections, then costs = ¢40,275.

A.	Total revenue which could have been collected	¢536,998
B.	Amount actually collected	357,473
C.	Difference (A-B)	179,525
D.	Less campaign costs	- 40,275
	Net (C-D)	¢139,250

LICENSE FEE REVENUE PERFORMANCE

License fees are collected from individuals and businesses and are usually based on a flat rate for the type and size of business. The fact a flat rate is used means that the amount collected from each business does not rise with an increase in business volume. Unlike a sales tax, which is usually a percentage of the amount of the sale, the license fee does not automatically go up as inflation rises. This means that, in order to keep the fee current with the value of other goods and services, the fee rate should be adjusted periodically with inflation.

Potential license fee revenues are determined by multiplying the number of licensees by the license fee rate. To judge the collection efficiency of a given license, we need to know the number of would-be licensees and the fee rate. In many cases, however, we do not know how many persons or firms should be paying a license unless we conduct a survey. On the other hand, we can use our expected growth analysis technique to see what the growth should be in license fee revenues, given a baseline year.

Since license fees are also subject to more frequent rate changes than other types of taxes, we need to pay special attention to the impact of those changes. First, we need to account for rate changes in our growth projection analyses. Second, we should analyze the impact of the rate changes on fee paying compliance.

We are particularly interested in whether a fee rate increase causes a drop in the number of licenses paid. This information can then be used to (1) estimate the amount of revenue not being collected and (2) indicate which license fee rates have room for additional increases.

To analyze the impact of a fee rate increase on rate paying compliance, we conduct an analysis very similar to that which we did for the head tax analysis above. In this case, we simply compare the percentage growth in

revenues from a license to the percentage increase in the fee rate. If the growth in revenues is proportional to the rate increase, we assume that there has been no negative impact on compliance.

If the revenue growth has not kept up with the rate increase, we know that either (1) potential licensees are avoiding paying the fee or (2) the higher rate has driven some people out of business. In either case, the local government needs to be concerned. The following case study presents the results of an application using this comparative growth analysis of local license revenues.

CASE STUDY: License Fee Revenue Analysis

Figure 27 presents the revenues and fee rates for four different license fees of a municipality for the period 1979 to 1982. The figure also shows the fee rates and percentage increases of both the revenues and the fee rates from one year to the next. Note that the fee rates for several of the license categories are shown as averages. In these cases, several different licenses are lumped together, making it necessary to use an average of the fee.

We analyze the data in the figure by comparing the percentage change in total revenues for each license with the change in the fee rate. On the basis of this examination, we see the following:

- Corn milling fees -- overall the growth in revenues has exceeded the increase in rates, indicating that (1) there is a strong underlying growth in revenues that is not tied to rate increases, and (2) rate increases have not been so large as to discourage paying. This suggests that revenues should continue to rise without any rate increases and that there should be room for additional rate increases to raise more revenues.

- Slaughterhouse fees -- the large increase in rates between 1980 and 1981 was not matched with a similar increase in revenues. There seems to be a very low underlying growth in slaughterhouse revenues and a resistance to large fee rate increases. Either the high fee rate discouraged use of the slaughterhouses, or there is substantial avoidance of paying the legal fee. This calls for further investigation, with the possibility that the fee rate increase may need to be rolled back.

- Market stall fees -- revenues have shown a strong growth trend, exceeding rate increases in the first three years. However, the rate increase in 1982 was not matched by a similar rise in total revenues, indicating that the limit on large rate increases every year may have been reached. The local government should be cautious about applying more rate increases, given the importance of the revenue source

Figure 27

Selected License Fee Revenues,
West Dagomba District Council

	FY79	FY80	FY81	FY82	% Change 1979-82
Corn Milling Fees	11,150	14,160	23,081	24,927	
% increase from previous year	-----	27%	63%	8%	124%
Fee rate	¢1.20	¢1.50	¢2.50	¢2.50	
% increase from previous year	-----	25%	67%	0%	108%
Slaughterhouse Fees	14,620	14,766	18,015	18,915	
% increase from previous year	-----	1%	22%	5%	29%
Fee rate (average)	¢2.25	¢2.25	¢4.00	¢4.00	
% increase from previous year	-----	0%	78%	0%	78%
Market Stall Fee	124,800	206,440	330,300	422,784	
% increase from previous year	-----	65%	60%	28%	239%
Fee rate (average)	¢1.00	¢1.25	¢2.00	¢3.00	
% increase from previous year	-----	25%	60%	50%	300%
Taxi Fee	17,220	16,359	24,538	26,500	
% increase from previous year	-----	- 5%	50%	8%	54%
Fee rate	¢10.00	¢20.00	¢15.00	¢15.00	
% increase from previous year	-----	100 %	- 25%	0%	50%

and the fact that the cumulative 300 percent rate increase is much greater than for any other license fee.

Taxi fees -- the 100 percent rate increase in 1980 resulted in a drop in revenues, indicating that the increase was too steep. The local government wisely reduced the fee in 1981, resulting in a 50 percent rise in revenues. Given the 8 percent rise in revenues between 1981 and 1982 when there was no rate increase, we see a strong underlying growth trend in the number of taxis. With more modest rate increases in the future, revenues should continue to increase.

USER CHARGE REVENUE PERFORMANCE

User charges are fees that citizens pay for the use of a public service. These are services for which citizens are usually willing to pay and whose value can usually be measured. Municipal services that commonly carry user charges include water, sewer, refuse collection, markets, parking lots, bus terminals, electricity, and telephone service.

A comprehensive treatment of user charges would require an entire volume in itself. However, in this manual we must limit our concern to relatively simple analyses of revenue flows from user charges.

We are concerned here with three types of analyses of user charge revenues. The first type is the COLLECTION EFFICIENCY, which is defined as the percentage of total charges due that are actually collected. This is similar to collection efficiency in taxes. The second type of analysis is COST RECOVERY, which is the percentage of the total costs of supplying the service that is recovered through user charges. The third type of analysis is the REVENUE PER UNIT OF SERVICE, which is the amount of revenue realized per unit of service delivered, such as revenue collected for each cubic meter of water pumped by the municipal water authority.

The first type of analysis, collection efficiency, is actually comprised of two separate measures. The first is the actual collection efficiency, which is defined as the percentage of the total amount of billings that is collected. The second measure is the billing efficiency which is the percentage of total amount of services provided that are actually billed. For example, if a water authority delivers a million cubic meters of water per day but only bills for eight hundred thousand, its billing efficiency is 80 percent.

$$\text{collection efficiency} = \frac{\text{amount collected}}{\text{amount billed}}$$

$$\text{billing efficiency} = \frac{\text{amount billed}}{\text{amount of services provided}}$$

In examining billing efficiency we must also be aware of natural "leakages" within the system. For example, in water and electricity supply systems there is a certain amount of loss that occurs within the system distribution that is not actually consumed by a user. Therefore, if one is comparing amount of water pumped with amount billed, the discrepancy can be caused by line leakage or by underbilling. Normally design specifications for water and electricity systems will give estimated leakage, or line losses. These loss factors must be accounted for in estimating the amount of water, or electricity, delivered.

It is useful to monitor both types of efficiency on a monthly basis, particularly to see when efficiency starts to fall. There may also be seasonal patterns in collection efficiency. For example, some households may stop paying water bills when the rainy season starts, using rain water instead of piped water. Noting these patterns in changes in the efficiency ratio from month to month may help the municipality devise strategies to improve overall collections.

Figure 28 provides an example of financial data for a typical municipal water authority. The information in this figure will be used to illustrate several different types of analyses for user charge revenues. The first type of analysis is the calculation of the billing efficiency and collection efficiency. Figure 29 shows these calculations for the data provided in Figure 28.

Figure 28

Example of Cost Recovery Ratio Analysis:
Water System Revenues and Expenditures for City X

(Average Monthly Figures)

	Year					
	1978	1979	1980	1981	1982	1983
Total Revenues Collected	$ 80,625	$ 92,812	$113,343	$ 19,789	$120,600	$121,005
Amount Billed	$101,000	$126,500	$151,050	$162,700	$163,000	$163,000
Total Expenditures	$187,500	$206,250	$226,875	$249,562	$274,520	$301,970
Total Water Pumped (m^3)	187,500	187,500	200,000	200,000	200,000	200,000
Line Loss (Design Standards)	20%	20%	20%	20%	20%	20%
Total Water Delivered (m^3) 1/	150,000	150,000	160,000	160,000	160,000	160,000
Water Rate	$0.75/m^3$	$1.00/m^3$	$1.25/m^3$	$1.40/m^3$	$1.40/m^3$	$1.40/m^3$

1/ Total amount pumped minus line loss

Figure 29

Calculation of Billing and Collections Efficiencies,
City X Water System (from Figure 28)

		1978	1979	1980	1981	1982	1983
A.	Amount of Water Delivered (m^3)	150,000	150,000	160,000	160,000	160,000	160,000
B.	Charge/m^3	$0.75	$1.00	$1.25	$1.40	$1.40	$1.40
C.	Total Revenue Base (A x B)	$112,500	$150,000	$200,000	$224,000	$224,000	$224,000
D.	Amount Billed	$101,000	$126,500	$151,000	$162,700	$163,000	$163,100
E.	Billing Efficiency (%) (D÷C)	89.8%	84.3%	75.5%	72.6%	72.7%	72.8%
F.	Amount Collected	$80,625	$92,812	$113,343	$119,789	$120,600	$121,005
G.	Collection Efficiency (%) (F÷D)	79.8%	73.4%	75.1%	73.6%	74.0%	74.2%

Referring to Figure 29, we calculate the collection efficiency by simply dividing the amount billed by the amount collected. To calculate the billing efficiency requires that we first estimate the amount that should be billed. To do this we must multiply the amount of water delivered by the water rate. We then divide the amount billed by the total amount that should be billed to get the billing efficiency.

Examining the efficiency ratios in Figure 29, we see that both have declined over the six-year period. The billing efficiency decline has leveled off in the last three years while the collection efficiency has been fairly stable over the last five years.

From the analysis of our example, it is clear that both billing and collection systems could use improvement. However, where is the greater payoff -- in improving the billing system or in improving collections? Figure 30 shows how we would answer that question -- by calculating how much additional revenue we could collect if we improved billings and collections to 100 percent.

Figure 30 shows that the municipality lost over $60,000 by poor billing practices in 1983 and over $42,000 in collections. Therefore, we should start with improvements in billing practices but also pay attention to collection procedures. Improvements in both systems together could yield close to $100,000 in additional local government revenues.

The cost recovery ratio is the second type of analysis we can perform on user charge revenues. The cost recovery ratio is the amount of revenue compared to the cost of providing a service. A service is said to be self-financing if revenues equal or exceed the costs. If a service is not totally self-financing, then the local government must make up the difference -- i.e., provide a subsidy.

Figure 30

Calculation of Revenue Lost Through Poor Billing
and Collection Efficiences in 1983,
City X Water System

1.	Amount lost due to poor billing	
	Total revenue base estimate (amount that should be billed)	$224,000
	Amount billed	163,100
	Amount lost due to poor billing	$ 60,900
2.	Amount lost in collection	
	Amount billed	$163,100
	Amount collected	121,005
	Amounted lost	$ 42,095
3.	Total lost from both	$102,995

We should monitor the cost recovery ratio over time. In general, fee-bearing services should become increasingly self-financing so we would want the ratio to rise over time. If the ratio is declining over time, this means that the local government subsidy must be increased to cover the deficit.

To calculate the cost recovery ratio, we need, in addition to revenue data, information on the costs of providing the service as well. Furthermore, this expenditure data should be complete and include the TOTAL cost of providing the service. Methods of assembling expenditure data are covered in Chapter 4 of this Handbook.

Figure 31 provides an example of calculating the cost recovery ratio using the data from Figure 28 above. The calculation is very straightforward; we simply divide the revenue collection amount by the total expenditure amount. The example in Figure 31 shows that the ratio, after increasing in the first two years, began a steady decline for the last three. The reason for the decline is apparent if we examine the revenue and expenditure figures: revenues have leveled off since 1980, while expenditures have continued a steady increase. This suggests that water rates need to be raised since consumption of water has leveled off as well.

The third type of analysis that we should perform on user charge revenues is the analysis of revenue per unit of service delivered. This analysis can only be used for services which can be measured on a quantity basis, such as water supply or garbage collection. The basic analysis is to convert revenues and expenditures to unit measures such as dollars per cubic meter of water. This is particularly useful if the service fee is based on a unit charge, as is common with water rates.

Figure 32 shows the calculation of unit costs and revenues for the municipal water authority data provided in Figure 28 above. The figure also includes the water rate fee as a basis of comparison. In addition,

Figure 31

Calculation of Cost Recovery Ratio,
City X Water System

	1978	1979	1980	1981	1982	1983
A. Total Expenditure	$187,500	$206,250	$226,875	$249,562	$274,520	$301,970
B. Total Revenues	$ 80,625	$ 92,812	$113,343	$119,789	$120,600	$121,005
C. Ratio of Expenditure to Revenues (B ÷ A)	.43	.45	.50	.48	.44	.40

Figure 32

Calculation of Unit Costs and Subsidies,
City X Water System

	1978	1979	1980	1981	1982	1983
A. Revenue/m^3	$0.53	$0.62	$0.71	$0.75	$0.75	$0.75
B. Cost/m^3	$1.25	$1.38	$1.42	$1.56	$1.72	$1.89
C. Rate charge/m^3	$0.75	$1.00	$1.25	$1.40	$1.40	$1.40
D. Built-in subsidy (B - C)	$0.50	$0.38	$0.15	$0.16	$0.32	$0.49
E. Actual subsidy (B-A)	$0.72	$0.76	$0.71	$0.81	$0.97	$1.14
F. % Total cost provided by subsidy (E ÷ B)	57.5%	55.1	50.0	51.9	56.4	60.3

the figure shows the calculation of two types of subsidies. The first subsidy is the "built-in subsidy," which is the difference between the unit cost of supplying water and the water rate. This is the amount that the local municipality would have to subsidize even if it collected 100 percent of the water rates. Clearly, if the water rate is less than the unit cost of the service, a subsidy will have to be required.

The second type of subsidy shown is the "actual subsidy" which is the difference between the revenue collected and the cost of providing the service. By looking at both subsidy amounts over the six-year period, we see several things:

- built-in subsidy was decreased in 1980 with a rise in water rates but has been increasing since and
- The actual subsidy has steadily increased since 1980 and in 1983 has amounted to 60 percent of the total cost of every cubic meter of water pumped.

In order to reduce the amount of subsidy paid by the local government, it is clear that two things have to happen: (1) water rates have to go up and (2) collection efficiency has to rise dramatically. Looking at the impact of past water rate increases, we see that in 1980, an increase of 25 percent in the water rate resulted in revenue increases of only $0.04 per cubic meter, or 5.6 percent. This suggests that the problem cannot be solved merely by raising water rates. Rather, the analyses indicate that an effective solution must address billing and collection efficiency problems as well.

3.2 Comparative Revenue Analysis Among Municipalities

Analyses of the revenue performance of individual municipalities can be greatly aided by comparisons with other similar cities. In addition, analyses of financial performance across municipalities can also reveal problems of local government finance in general, which is of concern to national agencies.

Comparison among municipalities is particularly valuable when information on individual tax bases is not available. That is, if we do not know what the tax base is for a given revenue source of a city, we need some other means to measure collection performance. A comparison with other cities' performances allows us to make that assessment in the absence of precise information on the revenue base of a particular city.

In multi-city analysis, it should be emphasized that we are developing comparative data for a GROUP of municipalities; we may then use the group data to assess how an individual city is doing compared to the group. We may also use group data to assess how the group of cities is doing overall.

In a sense, we use the group data as a measuring rod against which to compare an individual municipality's performance. It should be emphasized that this approach has been developed to assist municipal officials in determining where improvements can be made in revenue performance. It is not intended as a device for rating achievement or competency of individual municipal management.

This section is divided into several parts. The first addresses the issue of standardizing financial data, which makes it possible to compare data from different municipalities in a meaningful way. The second section deals with analyzing trends in financial data of the group of municipalities. This allows us to spot problems overall in revenue generation across the group; it also allows us to make more informed

comparisons between the group data and individual city data. Third, techniques for making comparisons and estimating potential revenue increases are presented which allow local government officials to identify which revenue sources can be most readily improved. Finally, techniques for projecting future revenue collections are presented.

3.2.1 Standardizing Group Revenue Data

In order to use data from a group of municipalities as a basis of comparison, we first need to standardize the data. We are interested in standardizing in two ways: (1) creating the same measure, or unit of comparison, among the municipalities, and (2) making sure that we are comparing similar types of municipalities.

To obtain the same unit of comparison, we need to translate all financial data into PER CAPITA MEASURES. Since all municipalities have different numbers of people, in order to compare we should translate all measures of revenue collections into revenues per person. This is done simply by dividing the total revenue for each revenue source by the population estimate for that year.

Figure 33 shows the per capita revenue amounts for a sample of fourteen cities in the Philippines. The figure shows the average per capita amount for the fourteen cities.

Figure 33

Per Capita General Fund Revenue Sources for
All City Sample, Philippines
(Philippine Pesos)

	Property Tax Total	Business Tax	Utility User Charges	Markets & Sl'hses	Central Gov't Grants	TOTAL
1977	1.12	2.28	.65	3.35	5.29	12.46
1978	1.02	2.69	.70	3.96	5.10	13.21
1979	1.07	3.01	.75	3.86	5.10	13.87
1980	1.56	3.01	.75	4.67	5.00	14.64
1981	2.69	3.42	.74	4.97	6.26	17.78

The average per capita amounts in Figure 33 show us the general trends in municipal revenue collections over the five-year period. However, we are concerned that lumping all the cities together may hide some important differences among the cities.

We are particularly concerned that the cities in our sample range in size from 10,000 to 75,000 population; we suspect that the smaller cities may perform much differently on some revenue sources than the larger cities in the sample. Therefore, we divide the sample into large and small city groupings and recalculate the per capita figures for these two groupings.

Figure 34 shows the per capita averages for the large and small city groupings. An examination of the figures shows that the business taxes and market-related fees are much more important revenue sources for the larger municipalities than the smaller ones. Somewhat surprisingly, the property tax appears to yield about the same per capita in both sizes of cities, except for the year 1981 when it recorded a large increase in the larger municipalities in the sample.

From the differences noted above, we conclude that we should treat groups of small and large municipalities separately in any comparative analysis. In addition, some municipalities may have other special characteristics that set them apart. For example, different regions of a country may have quite different income and wealth profiles. These need to be taken into account in selecting the comparative groupings.

Figure 34

Per Capita General Fund Revenue Sources
for Large and Small City Samples
(Philippine Pesos)

	Year	Property Tax	Business Tax	Utility Charges	Markets Sl'hses	Central Gov't Grants	Total
Small Cities	1977	1.18	.94	.56	.91	5.80	9.39
	1978	1.10	1.21	.34	1.17	5.49	9.39
	1979	1.27	1.37	.64	1.48	5.63	10.36
	1980	1.59	1.58	.68	1.55	5.72	11.12
	1981	2.05	1.81	.63	1.56	6.97	13.02
Large Cities	1977	1.07	3.41	.96	5.57	4.84	15.80
	1978	.91	3.73	1.15	7.10	4.74	17.63
	1979	.98	4.04	1.54	6.39	4.64	17.59
	1980	1.57	3.86	1.51	7.88	4.55	19.36
	1981	2.90	4.32	2.04	8.05	5.55	22.87

3.2.2 Trend Analysis of Comparative Data

Before we compare data from a single municipality to data from the group of cities, we should examine the composition and growth trends in the group data. This analysis is similar to the type of trend analysis used in the single-city analysis presented in Section 3.1.

We are interested first in the change in composition over time. Figure 35 shows the percentages of total revenues contributed by individual revenue sources of the Philippines municipality data (from Figure 34). An examination of the figure shows the following:

- For both large and small cities, the central government grant revenues are declining in importance, although those revenues remain a much more important source for the smaller cities.
- Although business taxes and market-related fees are important (and growing in absolute amounts) in the large cities, their percentage contribution to local budgets has remained stable over the period.
- For the large cities, the decline in central government grant funds has been made up largely by increases in the local property tax in 1981.
- For the small cities, the decline in central government grant contribution has been made up by increased percentages in all local revenue categories.
- For small cities, the property tax remains the single most important local revenue source although the importance of the business tax is growing rapidly.
- If we use the profile of the large cities data as a projection of what the small cities will become as they grow larger, we can foresee the following changes in small city revenue profiles:
  - -- property taxes will remain stable, or decline, in importance

Figure 35

Percentage Composition of Revenues for Two Samples

	Year	Property Tax Total	Business Tax	Utility Charges	Markets & Salughterhouses	Central Government Grants	TOTAL
Small Cities	1977	12.6	10.0	6.0	9.7	61.8	100.00
	1978	11.8	13.0	3.7	12.6	58.9	100.00
	1979	12.2	13.2	6.2	14.3	54.2	100.00
	1980	14.3	14.2	6.1	13.9	51.4	100.00
	1981	15.7	13.9	4.8	12.0	53.2	100.00
Large Cities	1977	6.7	21.5	6.1	35.1	30.5	100.00
	1978	5.2	21.2	6.5	40.3	26.9	100.00
	1979	5.6	22.7	8.8	36.3	26.3	100.00
	1980	8.1	19.9	7.8	40.7	23.5	100.00
	1981	12.6	18.9	8.9	35.2	24.3	100.00

-- business taxes will continue to grow in importance

-- market-related fees will increase greatly in importance

-- central government grants will become increasingly less important.

This analysis suggests a rapidly changing profile as small cities grow in population. The data in Figure 35 (and also in Figure 34) show a considerable amount of fluctuation in property taxes, business taxes and market-related fees in the large cities in the sample. This fluctuation is of concern since it makes budgeting difficult.

The fluctuation in the property tax figures shows the "classic" pattern resulting from revaluation and slow updating of the property tax roles. From 1977 through 1979 per capita tax receipts were virtually level, or declined slightly as collections did not quite keep up with population growth. (Remember that the per capita figures take account of population growth each year.) Some of the cities in the sample had a revaluation in 1980, causing the property tax receipts to jump. The other cities in the sample had revaluation the next year, causing the per capita amount to rise again. We would expect the per capita property tax receipts to level off or even decline slightly in 1982 since that has been the pattern in the past.

In addition to the changing composition of revenues, we are also interested in the growth in individual sources of revenue. Figure 36 presents a calculation of the growth rates of the various revenue sources of the Philippines municipal sample from 1977 to 1981.

Figure 36 shows that the local sources of revenue have grown at a much higher rate than the central government grant funds. Local revenues have increased 68 percent in the small cities and 57 percent in the large. The growth in the small city revenues has been spread fairly evenly across the

Figure 36

Percentage Growth in Revenue Sources from 1977 to 1981 in Two Samples

	Local Revenues						
	Property Tax	Business Tax	Utility Charges	Markets Sl'Hses	Total Local Revenues	Central Gov't Grants	Total Revenues
Small Cities	73.7%	92.5%	12.5%	71.4%	68.5%	20.2%	38.7%
Large Cities	171.0%	26.7%	112.5%	44.5%	57.2%	14.7%	44.2%

three main categories of local revenues (property tax, business tax and market fees), while the growth has been spread unevenly across the revenue sources for the large cities.

These analyses of growth rates have been calculated in terms of "current" pesos -- that is, inflation has not been taken into account. However, inflation was quite high in the Philippines during the period 1977 to 1981, amounting to about 73 percent over that period. If we compare the performance of the different revenue sources to inflation, we see the following:

- The growth of total local revenues of the small cities almost matched the inflation rate while that of the large cities did not.

- Only the growth in the property tax and utility charges exceeded the inflation rate, and that occurred only because of tremendous jumps in 1981.

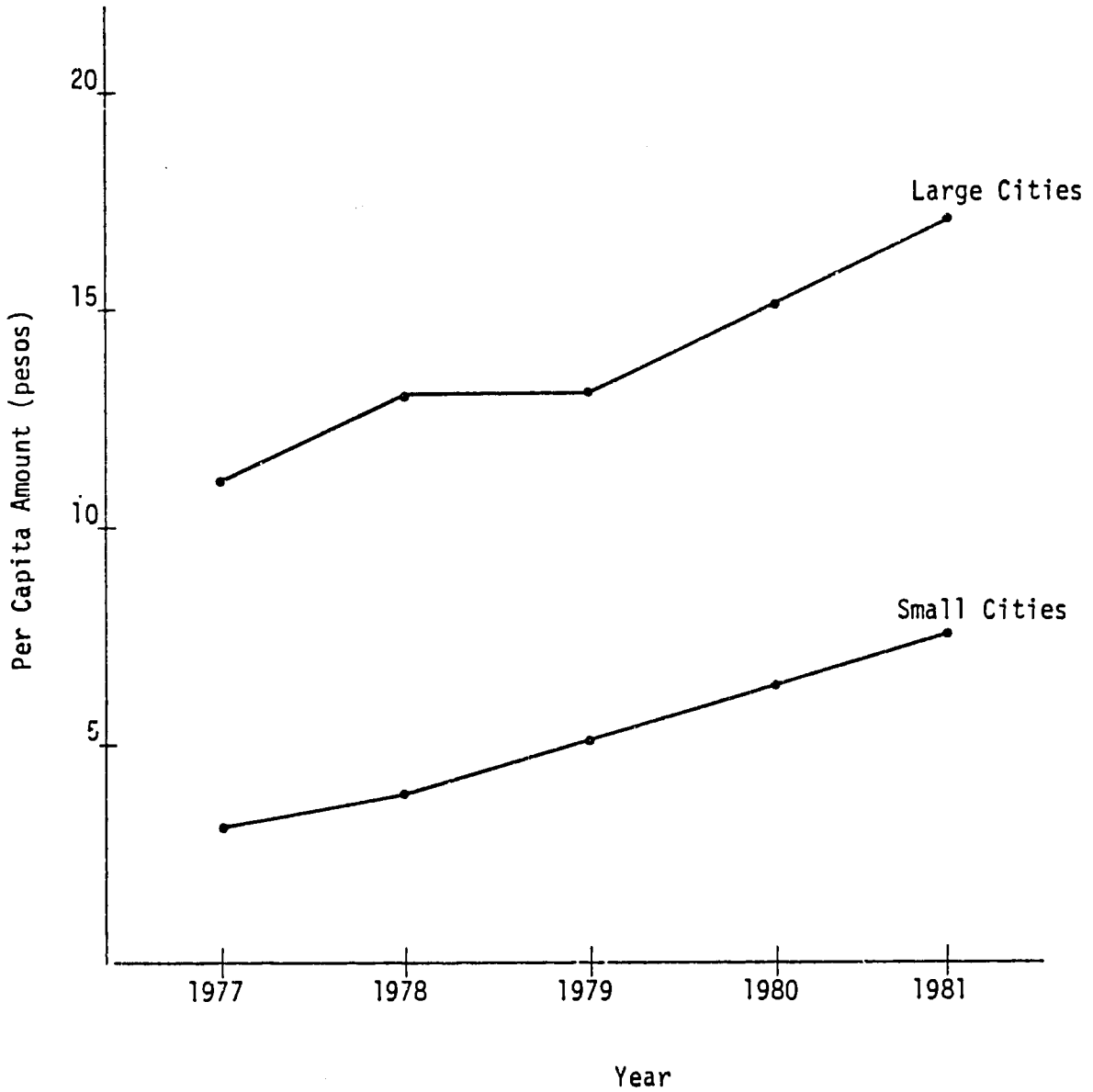
- Because of low growth in the central government contribution, total revenues of both groups did not keep up with inflation; this means that the local governments had less purchasing power to fund local services in 1981 than they did in 1977.

In addition to examining the total growth between 1977 and 1981, we are also concerned with the UNDERLYING PATTERN OF GROWTH. The best way to see if there is an underlying pattern and the direction of that pattern is to plot the year-to-year changes on a graph. Figure 37 shows the total of local revenues for the large and small cities in the Philippines sample plotted on a graph.

The line plotted for the small city data is nearly straight, making it easy to see the precise trend that local revenue collections are following. However, the line plotted for the large city data is not straight, making it difficult to see exactly what the overall trend is. There are two

Figure 37

Graph of Total Local Revenues, Per Capita
Small and Large City Samples



techniques that we may use to smooth out the fluctuations from year to year to plot a straight line that describes the underlying trend pattern.

The simplest technique is termed the "moving averages" technique. As the name implies, we use the average of several years' data to plot the values on the graph rather than the single-year data. For example, in a two-year moving average calculation, we take the average of the data for 1977 and 1978 and plot that number. We then take the average of the data for 1978 and 1979 and plot that. Figure 38 shows the calculation of the moving average for the revenue data of the small city sample.

A more sophisticated technique is the linear regression technique, which uses a statistical procedure to fit a straight line to the recorded data for the five-year period. The calculation of a linear regression line is somewhat complicated; it can done with a hand calculator, a programmable calculator, or a computer. A technical note at the end of this Handbook shows the formula for calculating the trendline by the linear regression technique by hand calculator.

Figure 39 shows trendlines plotted for the total revenue data of the Philippines sample using the linear regression technique. Having a straight trendline makes it much easier to see the precise growth rate in the underlying pattern of revenue collections. This technique also makes it possible to project future revenue collections (revenue projections are discussed at the end of this section).

In addition to plotting the trendline for total revenue collections, we can use this technique to analyze the growth in individual revenue sources. Figure 40 presents a set of graphs on which are plotted the trendlines of the property tax, business tax, market and slaughterhouse user charges, and central government grants.

Figure 38

"Moving Averages" of Per Capita Revenue Data
for Small City Sample, Philippines

	Property Tax	Business Tax	Utility Charges	Markets Sl'hse Fees	Central Gov't Grants	Total Revenues
1977/78	1.14	1.08	.45	1.04	5.64	9.36
1978/79	1.18	1.29	.49	1.32	5.56	9.85
1979/80	1.43	1.48	.66	1.52	5.68	10.75
1980/81	1.82	1.70	.66	1.56	6.34	12.07

Figure 39

Trend Line Plotted for Total Local Revenues
by Linear Regression Technique

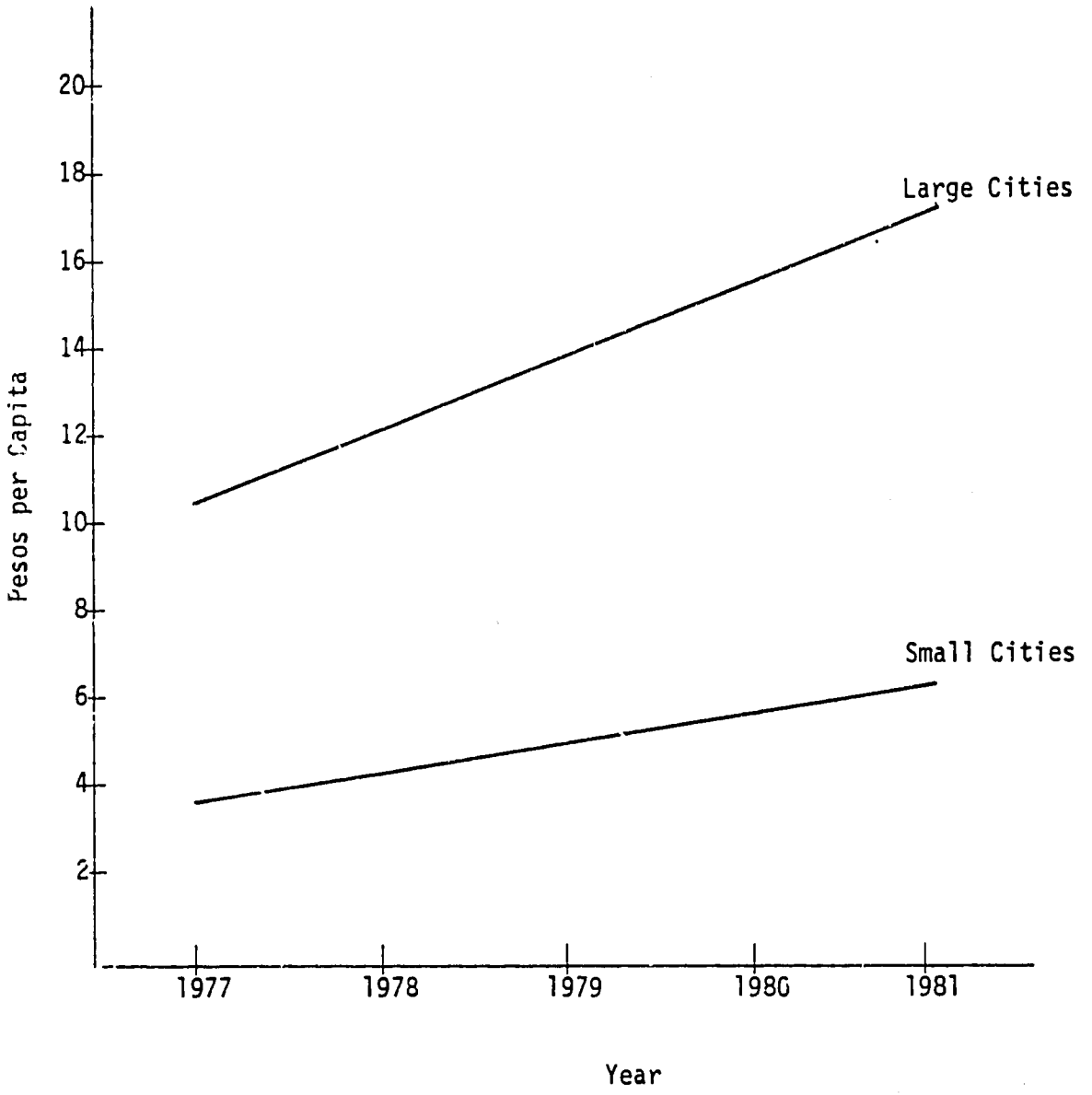
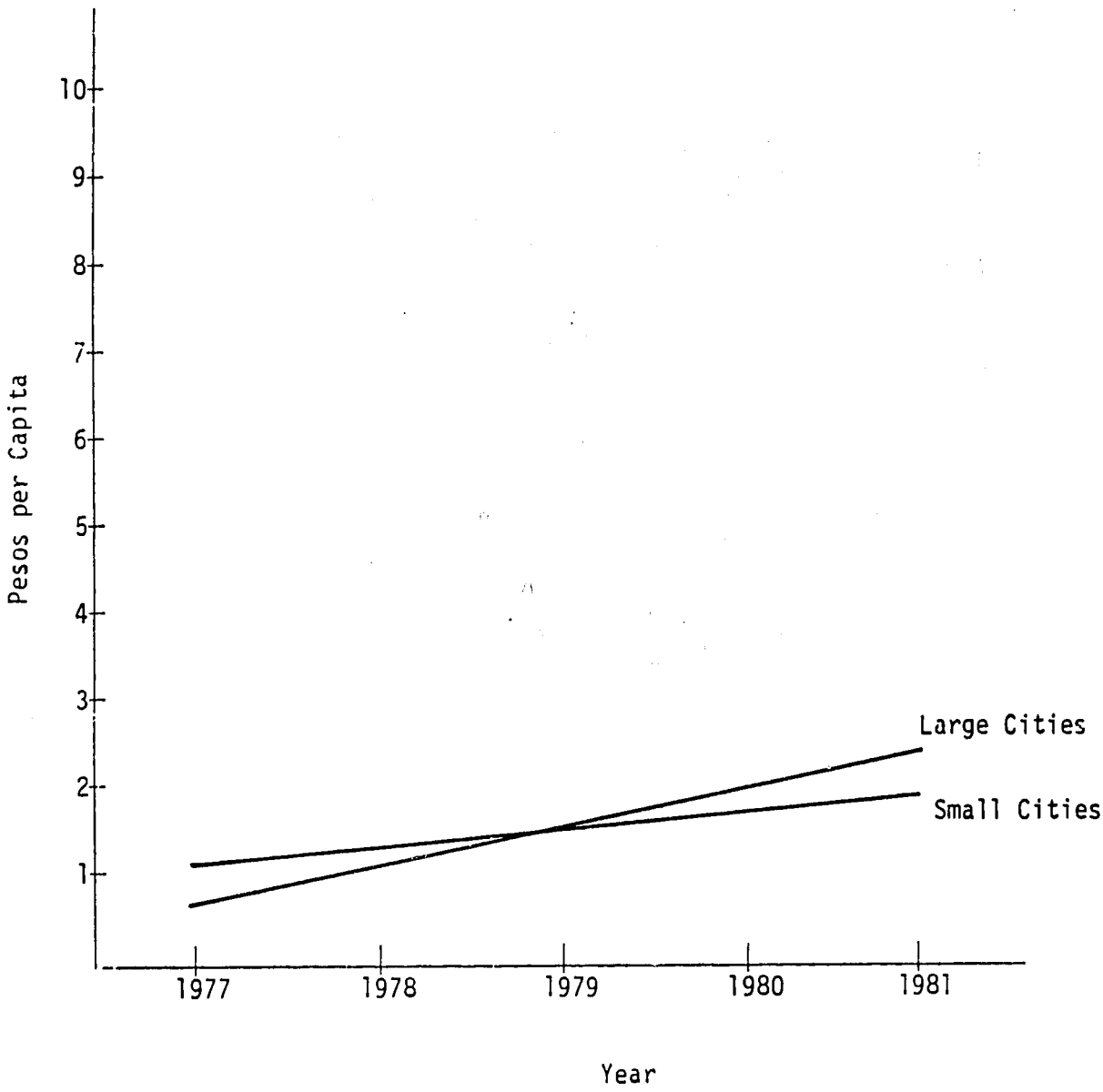


Figure 40

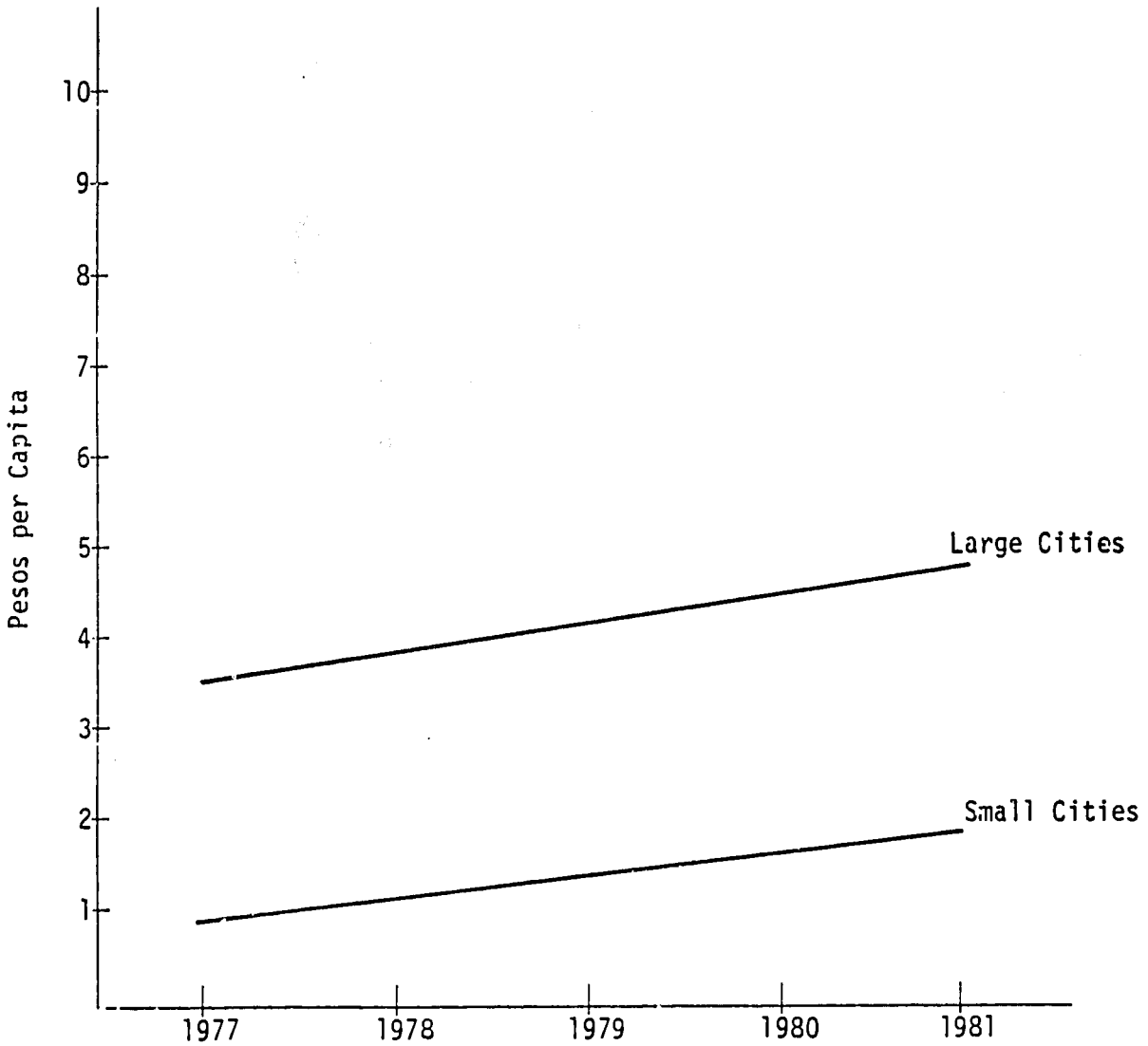
Per Capita Property Tax Trends



Graph of Trend Lines of Individual Revenue Sources,
Philippines Sample

Figure 40 a

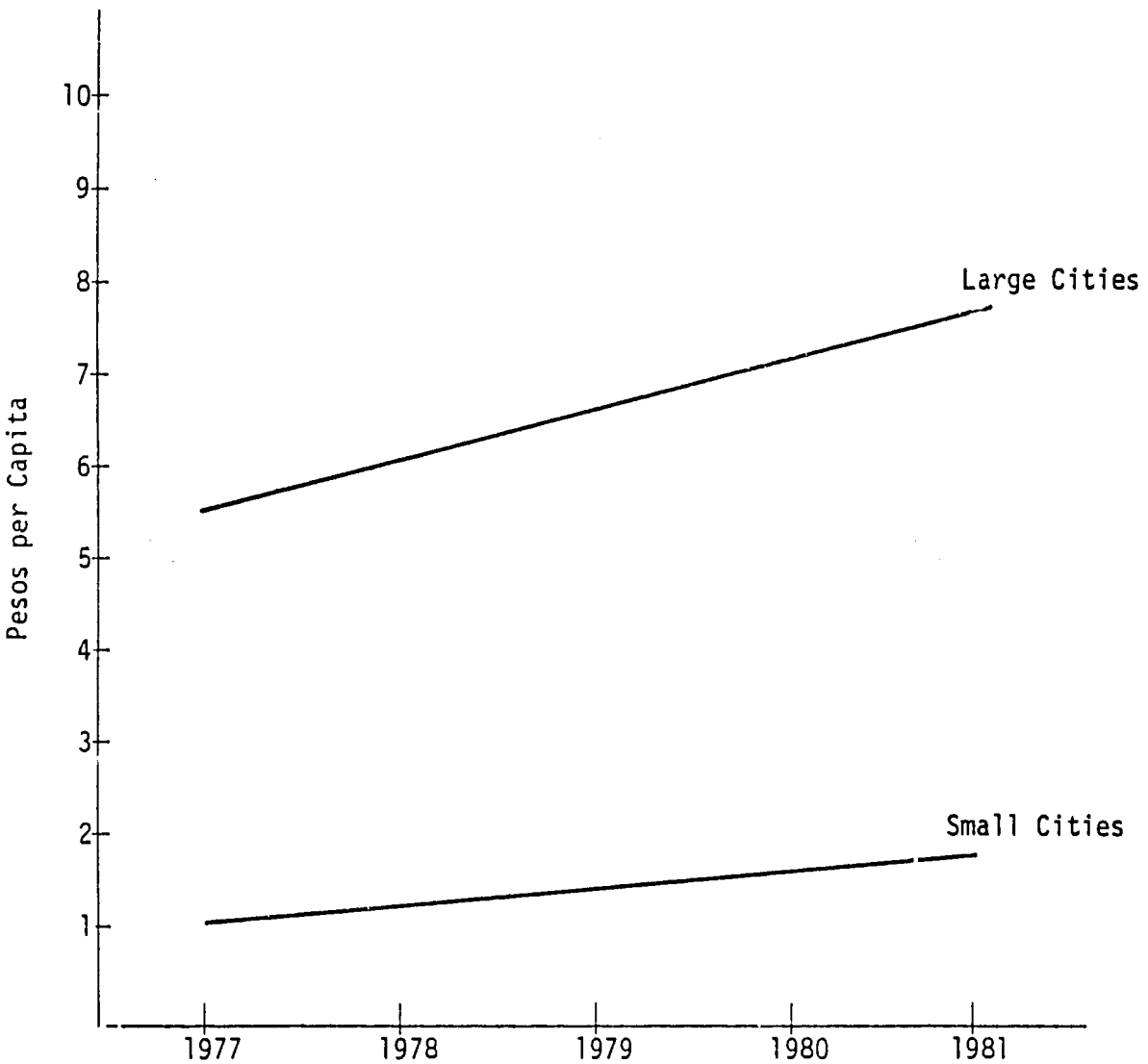
Per Capita Business Tax Trends



Graph of Trend Lines of Individual Revenue Sources, Philippines Sample

Figure 40 b

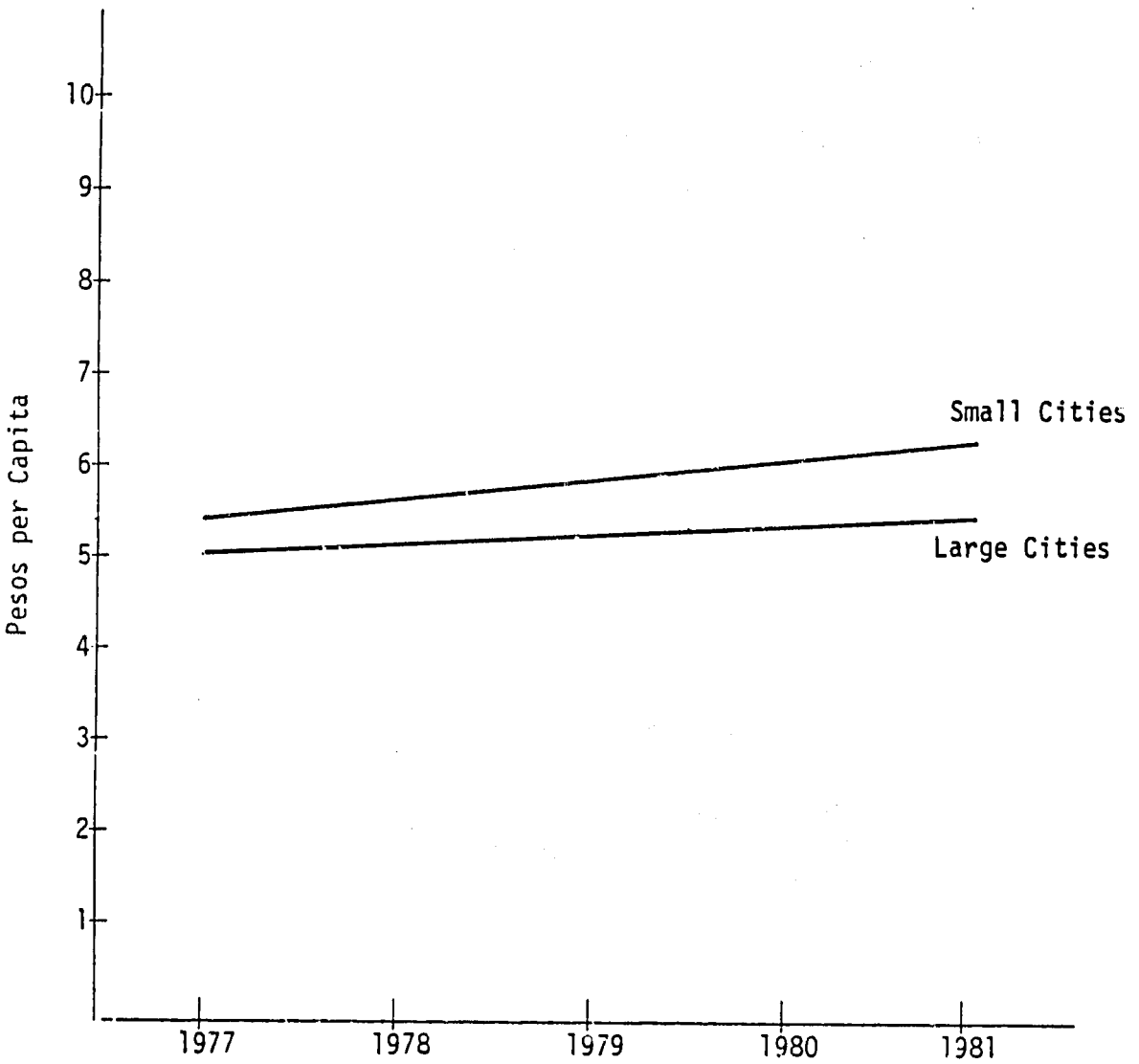
Per Capita Markets/Slaughterhouse Fees



Graph of Trend Lines of Individual Revenue Sources,
Philippines Sample

Figure 40 c

Per Capita Central Government Grants



Graph of Trend Lines of Individual Revenue Sources,
Philippines Sample

These graphs are quite useful in showing at a glance both the relative importance of the revenue sources between large and small cities as well as the relative rates of growth between the two groups. An examination of these trendlines reveals the following:

- Property taxes and market fees are growing at a faster rate for larger municipalities than for the smaller ones in the sample.

- Business taxes are growing at about the same rate for both groups, but with the per capita amounts at a considerably higher level for the large cities.

- Total revenues are growing at about the same rate for both groups of municipalities with the larger cities enjoying a higher level per capita; however, the central government grant is growing at a faster rate for the smaller cities, compensating for their slower growth in locally raised revenues (property tax, business tax, and market/slaughterhouse fees.)

These analyses of the group data provide a backdrop for using the data for comparative purposes. All comparisons that we now make with individual city data will take account of these overall trends in composition and growth.

3.2.3 Revenue Performance Comparisons

Having developed a good sense of the trends in revenue patterns of the group data, we can now use that data for comparison. We will perform two types of comparative analyses in this section:

- Comparisons using trend analysis

- Revenue potential analysis.

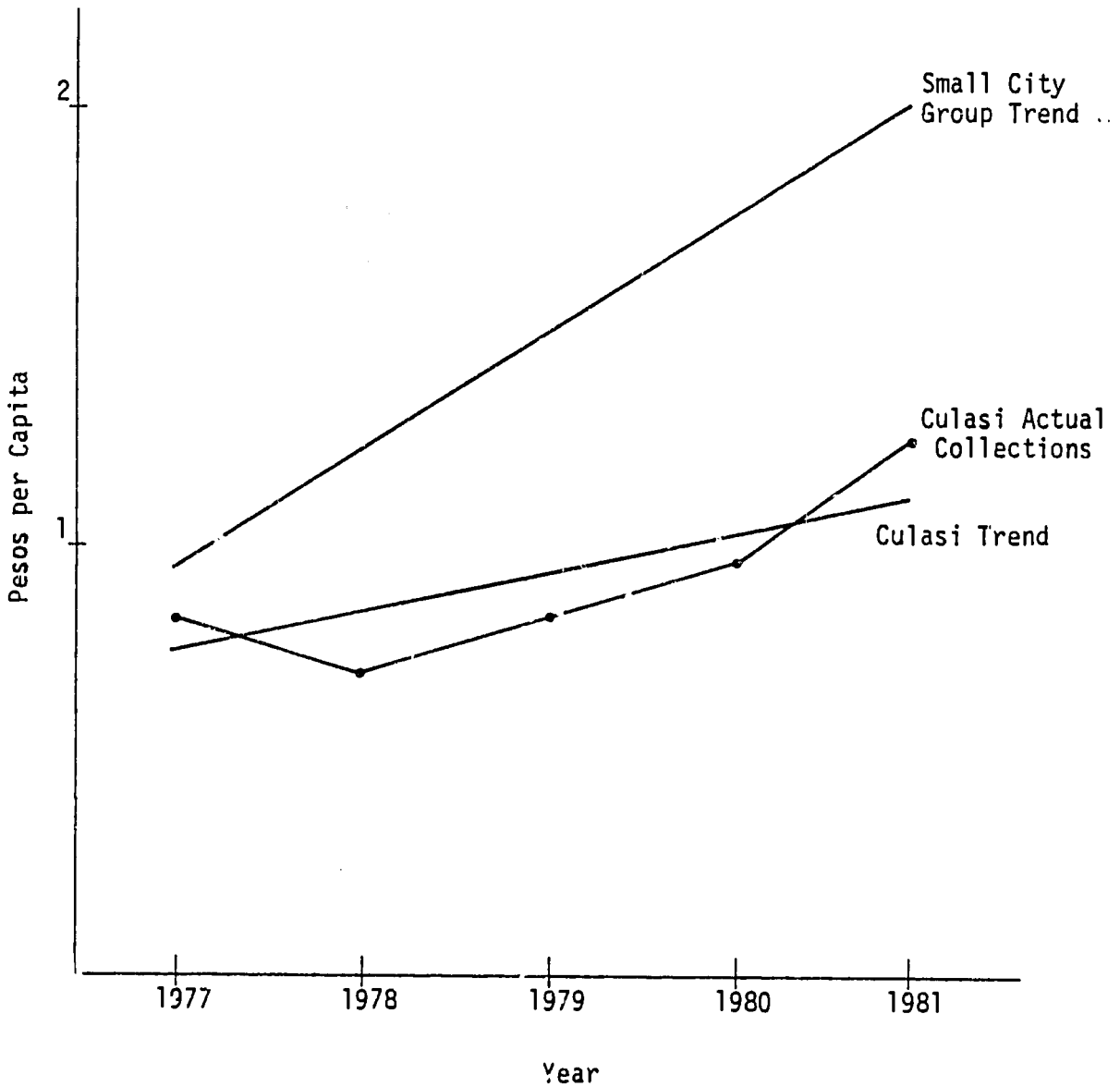
The first type of analysis compares the trends in a single municipality's revenue collections to the patterns seen in the group data. We are particularly interested in any significant differences between the trends in the group data and the trends observed in the revenue data of an individual municipality.

To illustrate how we use group data for comparative purposes, we will examine the case of the city of Culasi, one of the cities in the Philippines sample of fourteen cities. In our example, we will focus on the business tax revenues. To carry out the comparison, we first calculate a trendline based on the year-to-year business tax revenue amounts. Figure 41 shows a graph on which are plotted the actual business tax revenues collected for Culasi, the trendline for Culasi computed by linear regression analysis, and the trendline of the group's average business tax revenues (small-city group).

From a cursory look at the trendline of Culasi, it appears that business tax revenues are growing steadily. However, comparing the trendline of Culasi to the group trendline, we see that Culasi is collecting less revenue per capita than the group average. Furthermore, the growth in Culasi's business tax revenues is slower than the group trend, indicating that the city is falling further and further behind.

Figure 41

Business Tax Performance Comparison:
Culasi vs. Group Average Trends



What is particularly worrying is that Culasi is one of the larger cities in the small city group. As we discussed above, we would expect its revenue performance to become more like that of the large city sample. Therefore, we would expect it be experiencing more rapid growth in the business tax than other small cities. The fact that just the opposite is happening is cause for some special concern on the part of Culasi city officials.

This type of comparative analysis can be used for any of the local revenue sources. However, once we have determined that certain revenue sources are lagging behind in expected growth, how do we determine what would be the potential pay-off in improving that revenue performance? This question of pay-off potential is the focus of the next section of this chapter.

REVENUE POTENTIAL ANALYSIS

One of the most important outcomes of revenue analysis is to identify where revenues can be increased. To identify potential increases, we first need to establish how much a municipality should be able to collect for a given revenue source. As we have discussed above, ideally we would like to know what the actual "revenue base" of each source of revenue is. However, in most cases we do not have the information to estimate accurately the revenue base. Therefore, we need an alternative method of setting revenue collection targets.

Comparative data from a group of cities gives us a method for estimating what revenue targets should be for a given city. From the data analyses conducted above, we know how much other cities are collecting on a per capita basis. Therefore, we may select per capita targets based on that group experience.

This approach differs fundamentally from the concept of "tax effort," which has been used frequently as a measure of revenue-generating performance in

municipal financial analysis. Tax effort analysis seeks to compare public revenues raised to the total resource, or wealth, base of the community. Although conceptually sound, the tax effort approach has severe measurement problems in practice and has not proven very useful in helping local officials identify where to improve revenue generation. In contrast, the revenue potential approach is designed to identify where revenues should be able to be increased by relying strictly on comparisons among local governments.

In selecting the per capita targets for the revenue potential analysis, we may use either the average per capita figures from our group data, or we may choose targets based on the revenue collections of the better performing municipalities. Since we are interested in the potential revenue base of a municipality, we suggest using the targets based on the better performing municipalities.

As an example of how this is done, we will calculate revenue targets for the Philippines group data, using the average of the top two per capita revenue amounts for each revenue source in each year. Since we know that small and large cities differ on collections, we should construct revenue targets for the two groups separately.

The use of such targets requires informed judgment on the part of the analyst. There may be cases where a municipality has an uncommon economic base, - e.g., mining area or tourist center. In such atypical cases, the financial data for that municipality should be used cautiously in the revenue potential analysis.

Figure 42 shows the steps in constructing potential revenue targets for the sample of Philippine cities. This calculation provides us with revenue targets which represent what the better performing municipalities have been able to achieve in each year. They represent reasonable targets in that they are based on what other cities have been able to achieve. Figure 43

Figure 42

Calculating Revenue Potential Targets

Identify two highest per capita revenue amounts for each revenue source in each year. Compute the average of the two amounts; do this for each revenue source for each year. These are the revenue targets.

Example: for the Philippines small city samples, we have the following per capita revenue collection amounts for 1981. The two highest amounts for each revenue source are circled → the average of the two becomes the revenue target for that revenue source for 1981.

City	Property Tax	Business Tax	Market Sl'hse fees
Bontoc	1.66	1.76	.91
Bugasong	1.89	.59	(2.62)
Culasi	1.71	1.0	2.3
Libertad	1.24	.75	1.37
Liloan	2.15	2.77	.34
Pilar	(3.41)	.38	1.62
Sapian	(3.60)	1.60	1.97
Sogod	1.58	(4.44)	2.09
Sto Domin	2.18	(3.76)	(2.80)
Tibiao	1.5	.59	1.82
Revenue target =	3.50	4.10	2.72

shows the actual revenue targets calculated for both the small- and large-city groupings.

The targets shown in Figure 43 indicate what a municipality in that group should have been able to collect if it were performing as well as the better performing municipalities. The difference between the target and what any individual municipality did collect is the amount missed in potential collections for that revenue source. For example, if City X collected 3 pesos per capita on the property tax in 1981 and the target is 4.06 pesos, City X "missed" 1.06 pesos per capita in that year.

We can now carry this analysis one step further by estimating the total amount of revenue that a municipality could have collected if it were performing up to its potential. We do this by multiplying the target revenue per capita by the municipality's population to determine the total revenue potential. We then subtract the amount actually collected by the municipality to see what the additional revenue potential is for the municipality on any given revenue source. This total amount tells us what the potential payoff is for investment in improved revenue collection.

To illustrate the application of this technique we have prepared the following case analysis of several selected cities in the Philippine sample.

Figure 43

Target per Capita Revenues for Large and Small Cities, 1977-1981
(Philippine Pesos)

	Year	Property Tax Rate	Business Tax	Utility Charges	Markets & Slaughterhouses	Central Gov't Grants	TOTAL
Small Cities	1977	1.93	2.25	1.09	2.34	7.39	15.01
	1978	1.56	3.17	1.02	2.31	7.25	15.31
	1979	1.88	3.39	1.45	2.68	7.11	16.51
	1980	2.49	4.16	1.51	2.78	6.98	17.92
	1981	3.51	4.11	1.25	2.72	8.83	20.41
Large Cities	1977	1.32	4.08	1.42	7.88	5.58	20.28
	1978	1.04	4.94	1.58	10.28	5.45	23.29
	1979	1.16	5.29	1.54	8.71	5.33	22.03
	1980	1.70	5.66	1.51	11.37	5.20	25.44
	1981	4.06	6.49	2.04	11.30	6.35	30.24

CASE STUDY: Revenue Potential Analysis

Figure 44 shows the additional revenue potential for the years 1977 and 1981 for three municipalities selected from the small city sample of the Philippine municipalities. The amounts shown are the additional amounts that we estimate should have been collected if the municipality were performing as well as the top two cities in the sample. Negative amounts indicate that the municipality was performing better than the average of the top two -- that is, it was one of the best in that year.

In analyzing Figure 44, we look first for the largest amounts for each municipality in any one year. The largest amounts indicate where the payoff potential is highest for improvements in revenue collection; it also indicates where collection problems may exist. These are the areas where investments in improved collection should have the highest payoff for the municipality.

Looking at Figure 44, we see that Saipan should focus first on the business tax, which shows the highest potential. By the same token, Sogod should concentrate on the property tax while Culasi should focus on the business and property taxes.

There has been improvement in some revenue sources from 1977 to 1981. Culasi has improved its performance on the market and slaughterhouse revenues while Sogod has improved its business tax collections.

In addition to identifying where payoff potential is greatest, the figure also reveals some anomolies which require further investigation. For example, we would expect business taxes and market fees to parallel each other since they should both be positively correlated with the level of economic activity in the individual municipalities. However, in examining the performance of Culasi, we see that the market-related fees are performing well, while business taxes are below target in 1981.

Figure 44

Revenue Potential for Selected Cities
(Philippine Pesos)

City	Year (Pop.)	Property Tax Total	Business Tax	Utility Charges	Markets & Slaughterhouses	Central Gov't Grants	TOTAL
Sapian	1977 (17900)	- 1495	37649	19502	21689	61072	138413
	1981 (19000)	- 1814	47954	23666	14017	78787	162250
Culasi	1977 (24400)	27308	36295	23366	33493	35209	155670
	1981 (26100)	46782	79454	22910	8708	34606	199460
Sogod	1977 (25100)	14038	6985	27346	5763	43686	97820
	1981 (26600)	51185	- 9073	23177	16626	57664	139579

It should be emphasized that the analysis above is used as a starting point for further investigation into the reasons for poor performance on a given revenue source. The analysis is not a critical evaluation of management performance and should not be used to judge municipal management. It should be used as a tool to help direct attention to points where improvement appears most likely to be made.

Finally, it should be noted that this analysis presents a rather conservative approach to estimating revenue potential. It assumes only that all municipalities of a similar group can raise as much revenue as the best performing members of the group. In fact, all municipalities of the group may be able to improve substantially their performance; in such a case, the revenue potential analysis described above will underestimate true revenue potential. At a minimum, however, this technique can identify priority areas for improved revenue performance and can help individual municipalities target specific revenues for concerted action.

3.2.4 Projecting Future Revenue Trends

To improve financial management, local officials need to be able to project what future revenue collections are likely to be. They need this information to set rates for taxes and fees and to judge whether they can afford to take out loans. Chapter 5 of this Handbook deals with the techniques for projecting the "financial balance" of local governments. This section deals exclusively with the revenue side of the equation and is a necessary input to the financial balance analyses.

We are interested in projecting two types of revenue information:

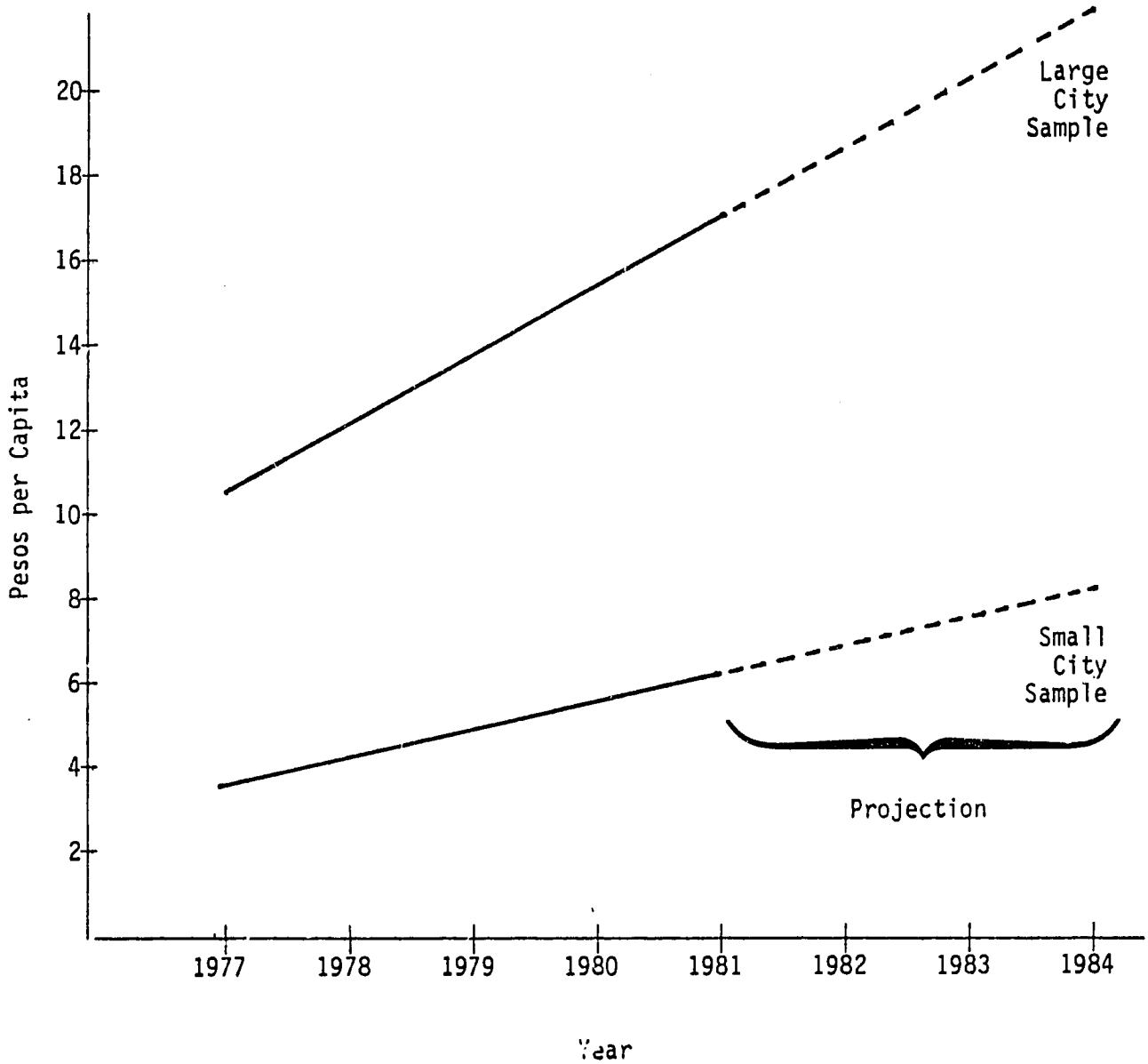
- Expected revenues based on past experience
- Revenues that could be expected if revenue performance improved.

To project on the basis of past experience means that we base our future expectation on a continuation of the past trends. This requires that we merely extend our trendline analysis from the present into the future, using either the moving average line or the linear regression trendline. Since the linear regression trendline gives us a straight line, we can use it most readily to project a future line. Figure 45 shows the future trendline projections for our Philippines sample using the linear regression line developed on the 1977-1981 data in Figure 39. The line on the graph simply extends the trendline three years into the future.

We should be careful about extending these trendlines too far into the future. Remember that this extension assumes that past trends will continue into the future. Because of the limitations of this assumption, we should be wary of trendline projections that extend more than two or three years into the future.

Figure 45

Projection of Local Revenues for
Small and Large City Samples, Philippines



Our confidence in trendline projections is also conditional on how well our trendline calculated by linear regression matches our actual past experience. That is, the trendline is calculated as the "best fit" of a straight line to the actual data. However, if the actual data vary greatly from year to year, the straight trendline will not match the actual data points very precisely. Figure 46 illustrates this point by showing two trendlines fitted to actual data by a linear regression calculation. Line A fits the actual recorded data points quite well while Line B does not. Consequently, we have more confidence in using Line A to project future trends than we would in using Line B.

Figure 45 projects total revenues for our Philippine sample for three years beyond the currently recorded data. We may also perform the same type of projection for individual revenue sources as well. These projections tell us what revenues should be if conditions remain the same. At the same time, our revenue potential analysis above indicates that most municipalities have considerable room for improvement. Is there some way to account for this potential in our future projections?

The answer is yes, in that we may develop future projections on the "revenue potential" data in the same manner that we projected revenue collections above. For any given city, we may plot the revenue potential versus the actual performance, as shown in Figure 47. The revenue potential trendline in the graph shows what we estimate the potential revenue to be in 1982 to 1986. If we assume that the city would take several years to improve its performance up to 100 percent of its target potential, we can project the potential growth in revenues to look like the line shown in Figure 48.

Figure 48 shows two alternative projections, one which assumes that full potential will be reached after four years and the second which assumes that only one half of the potential will be reached in that time period. Obviously, determining how much a local government is likely to improve

Figure 46

Illustration of "Best Fit" in Trend Lines
Produced by Linear Regression

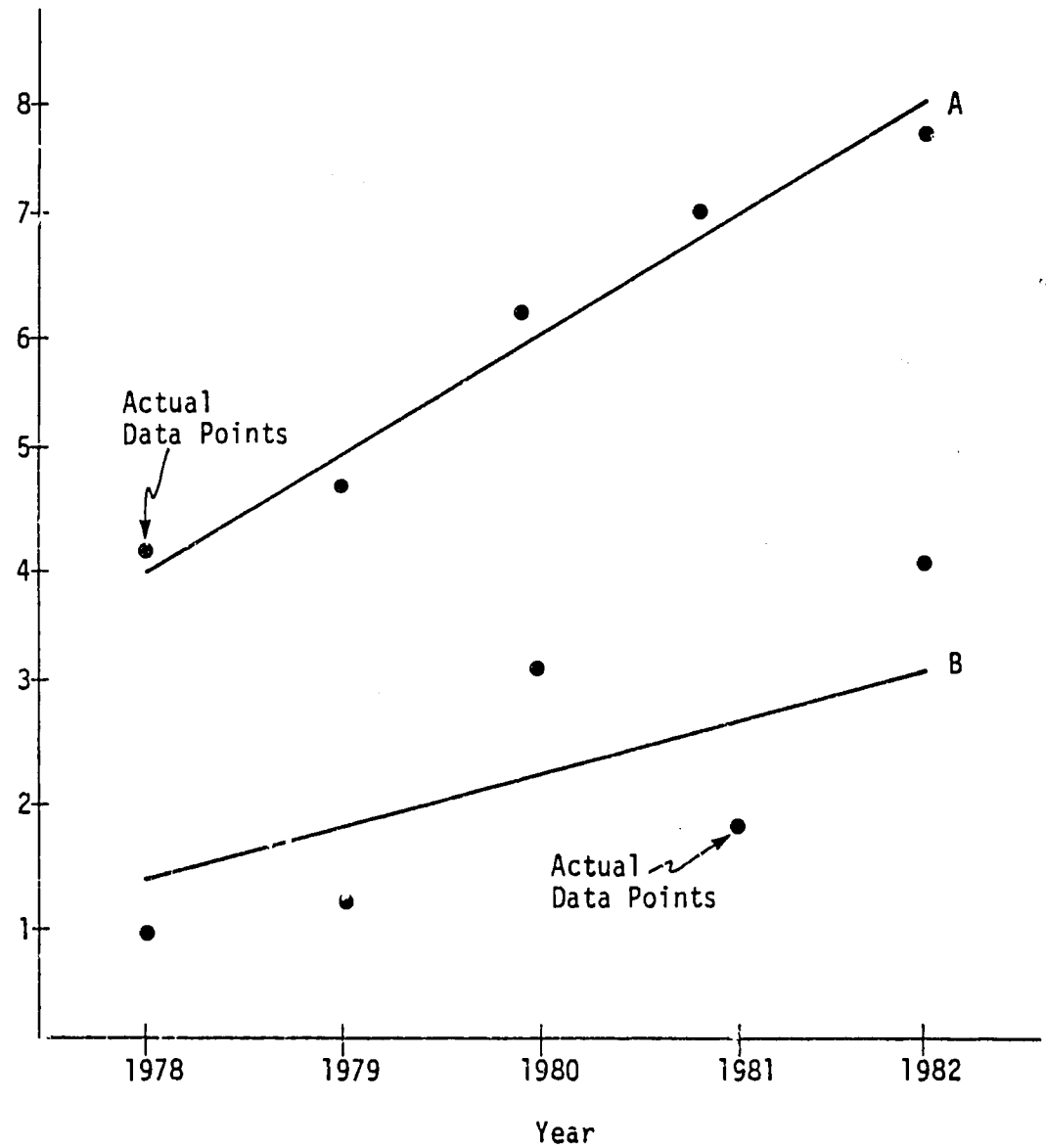


Figure 47

Revenue Potential Projection versus Projection
Based on Actual Collection History

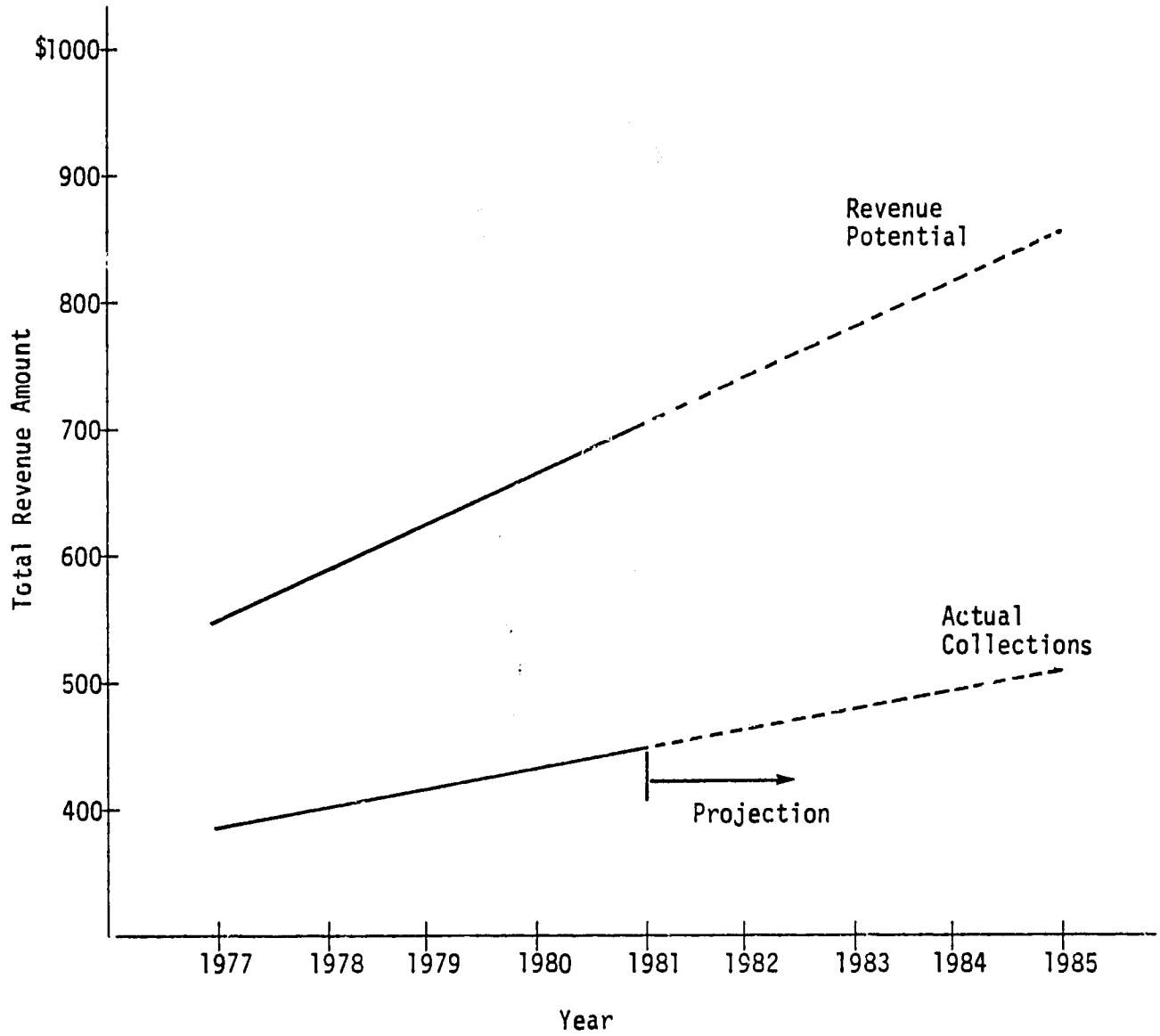
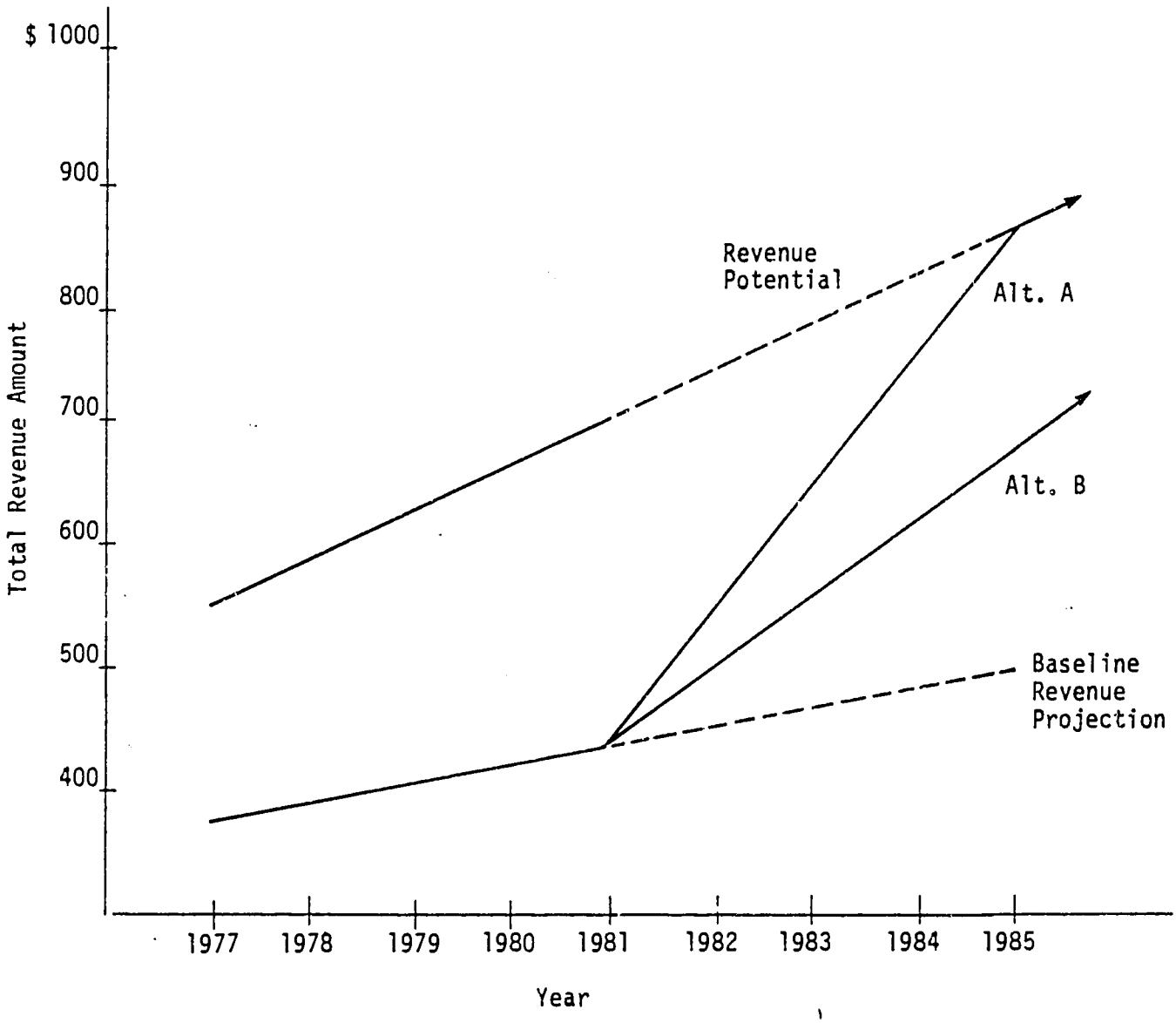


Figure 48

Alternative Revenue Projections Assuming Municipality
Reaches (a) Full Revenue Potential or (b) 1/2 Revenue Potential



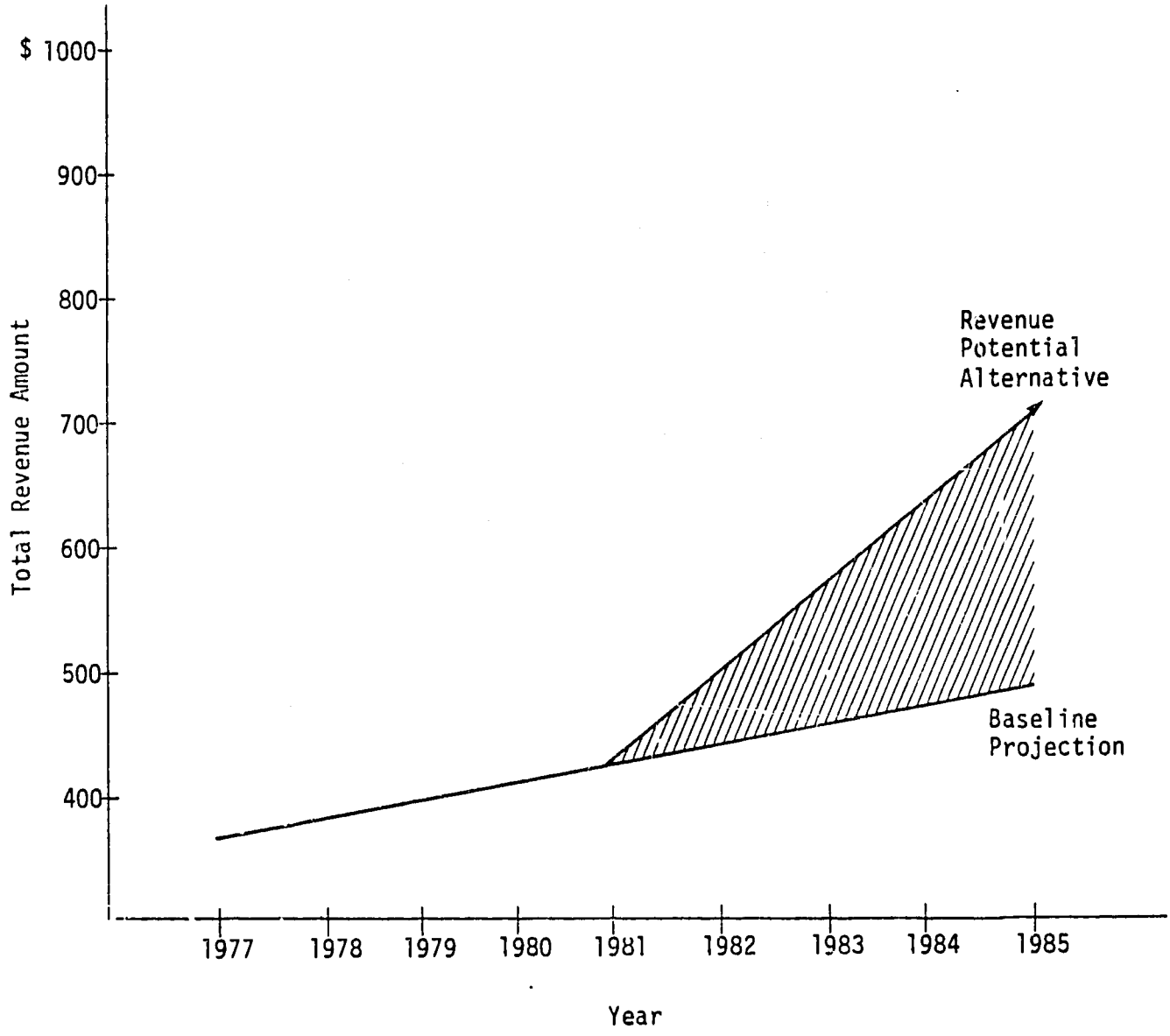
requires individual judgment rather than a fixed formula. However, for purposes of presenting the analytical technique, we can use these crude alternatives as a reasonable basis for illustration.

This type of trend projection can be used to establish upper and lower bounds of future revenue collections. For example, we would not expect a city that has been performing well below its revenue potential, such as that shown in Figure 46 above, suddenly to start collecting more revenues than its revenue potential target. Therefore, we may use the revenue potential projection as an upper bound on future revenue collections. At the same time, we may use the trendline projection based on past experience as a lower bound for future expectations.

Figure 49 shows the plotting of both upper and lower bounds (from the data in Figure 48) and the resulting range in which we expect revenues to fall in the future. In this example, we have used as the upper boundary the trendline that assumes that the local government can achieve one-half of its revenue potential over the four-year period. This type of revenue projection is extremely useful in the financial balance analysis, which is presented in Chapter 5.

Figure 49

Expected Range of Future Revenue Projections



CHAPTER 4
EXPENDITURE ANALYSIS

Expenditure analysis uses many of the same basic techniques used in the revenue analyses described in the preceding chapter. This is particularly true of the development of per capita measures, trend analyses, and projection techniques. However, there are some additional, different types of analyses that are performed on expenditure data which will be the focus of this chapter.

This chapter is organized somewhat differently than the preceding chapter, reflecting the different set of issues that need to be addressed in expenditure analysis. At the same time, the same distinction is maintained between analysis of financial data of a single municipality and analysis that uses comparative data across a group of local governments. Both types of analytical techniques are presented in this chapter.

The major topics covered in this chapter, by section, include:

4.1 Organizing Expenditure Data

- 4.1.1 Categories of Expenditure Data

  --- Different systems of reporting expenditures

- 4.1.2 Current versus Capital Expenditures

  --- Separating capital investment expenditures from current operating costs

4.2 Analyzing Overall Composition and Trends in Expenditures

- Overview analysis
- Calculating growth rates and underlying trends

4.3 Projecting Trends in Total Expenditures

- Continuation of past trends
- Deterministic projections
- Projecting ranges based on alternative assumptions

4.4. Analyzing Components of Expenditures

- Growth in personnel costs
- Growth in operation and maintenance (O&M) costs
  - projecting the impact of capital investments on future O&M costs
- Administrative costs versus direct costs of services

4.5 Analyzing Unit Costs of Providing Local Service

- Changes over time within a single municipality
- Comparative measures across municipalities
- Use of staffing ratios vs. expenditure-based ratios.

This chapter is divided into sections, each corresponding to the topics listed above. Since much of the trend analysis employs similar techniques to those used in revenue analysis, emphasis will be placed on describing the techniques not previously presented. However, where appropriate, applications of the revenue analysis techniques will be used and illustrated.

4.1 Organizing Expenditure Data

Expenditure data should be organized in the same way that we organized revenue data: by year and by expenditure category. The categories used for our analyses will necessarily be the categories by which expenditures are already reported on official forms to the central government. Since these categories differ for different countries, we cannot describe here a single set of categories for our analysis. However, the techniques that we use for analysis are applicable to different types of expenditure data.

4.1.1 Categories of Expenditure Data

Although expenditure data may be recorded in different forms, it is almost always categorized by different "funds". Funds may distinguish between capital investment and current operating expenditures. Alternatively, separate funds may be established for all expenditures incurred by a particular type of service; frequently, such funds are set up for water systems, public housing, public markets, and refuse collection. This is particularly the case for services that are intended to be self-financing and for which revenues are collected on a charge-for-service basis.

Municipal expenditure accounting systems may also keep track of expenditures by category of expense, such as labor, materials, debt service, etc. In addition, local governments may keep track of expenditures by government department; sometimes, the recorded data distinguish between current operating and capital investments, and sometimes they do not.

An expenditure accounting system that keeps track of expenditures by department often separates out overall administrative expenses from expenditures incurred in running specific public services. As shown in the discussions below, there are some very useful analyses that can be carried out on administrative costs.

Whatever the form in which expenditure data are presented, we need to have consistent data for several years. "Consistency" means that we have the same type of data in each category from one year to the next. For example, if loan payments are included in "current operating expenditures" in one year, they need to be included in that category for all years.

Once we have assembled several years' data on expenditures for a municipality, the first step in analyzing the data is to convert total expenditures into PER CAPITA figures, as we did for revenue data. These per capita figures will form the basis for most of the analysis techniques presented in this chapter.

4.1.2 Current versus Capital Expenditures

We should begin any analysis of local government expenditures with a discussion of the differences between CURRENT and CAPITAL expenditures. Current expenditures are those expenses of running the government on a day-to-day basis, including the operating costs of municipal services and local administration. Capital expenditures are investments in physical facilities that have a useful life beyond the current year, usually many years beyond. Examples of capital expenditures are construction of roads and water systems. Purchase of equipment, such as refuse collection trucks, are also considered capital expenditures.

Capital expenditures should be separated from current expenditures for two primary reasons: (1) they provide service for several years so their costs (and benefits) do not really occur in a single year, and (2) they usually occur in large blocks, so they distort the expenditure picture in the year they occur.

Many government accounting systems separate capital and current expenditures. In others, however, capital expenditures may be partially hidden in the current operating budgets of local governments. In Tunisia,

for example, surpluses in the municipal operating budgets at the end of the fiscal year are transferred to the capital budget of the following year. This transfer amount then ceases to be part of the operating budget and should be subtracted from the current expenditures data in any analysis.

A second place where current and capital expenditures become entangled is the treatment of loan repayment for capital investments. If a local government borrows for a capital investment, the loan repayments may be treated as part of the current operating budget. This will vary from country to country. Ideally, we would like to sort out these types of costs and treat them separately. At the very least, we need to treat them consistently. That is, if they are included in one year's data, they need to be included for all years. Furthermore, since these types of expenditures can be quite large compared to other expenditures, we need to keep track of them in our data.

A final note on the relationship between current and capital expenditures is that capital expenditures should create more operating expenses. For example, the construction of a water system creates the need for future maintenance and added management. This is one reason that some types of municipal services have separate fund accounts to keep distinct all types of expenditures incurred for those services.

In most countries, local capital expenditures are funded primarily, if not exclusively, by the central government. In addition, the central government may also provide a grant to the local government current operating budget. It is useful to compare capital and current operating expenditures for local governments to see (1) the trends in each type of expenditure over time, and (2) the degree of dependency of the local government on the central government.

Figure 50 shows the changing composition of expenditures for a sample of Ecuadorian municipalities from 1979 to 1981. The figure shows the percentage of total expenditures accounted for by current, capital, and debt service expenditures. The figure shows a rapidly rising proportion of loan repayments to other expenditures, meaning that past capital expenditures are now taking an increasing share of the local budget in debt service. Furthermore, capital expenditures represent a large, and relatively stable, component of the local budgets. This suggests that debt service in the future will likely rise as more and more debt is assumed by the local governments. The Ecuadorian case is discussed further in section 5.4 Flow of Funds Analysis.

Figure 50

Municipal Expenditure Patterns for a Sample of
of Ecuadorian Municipalities, 1979 - 1981

Expenditures	1979	1980	1981
Current	50.55%	35.29%	31.61%
Debt Service	4.02%	10.45%	13.14%
Other	8.63%	9.10%	12.48%
Capital Investments	36.79%	45.16%	42.77%

4.2 Analyzing Overall Composition and Trends in Expenditures

We turn our attention now from the relationship between capital and current expenditures to focus on analyzing current operating expenditures. These are the expenditures that are generally under the control of local governments and can best be related to local revenues. Current operating expenditures are normally recorded in the local government's general fund or other such account denoting general government expenditures.

We first analyze the trends in overall growth of local general fund expenditures, much the same way that we analyzed local revenues. Figure 51 shows the general fund expenditures of our sample of Philippine municipalities for the period 1977 to 1981. The figure presents the per capita level of expenditures for the large and small groups of cities. The figure shows that the level of expenditures for large cities is 35 to 50 percent higher than the level for small cities on a per capita basis. If we plot the expenditures on a graph (Figure 52) we see that the rate of growth in expenditures is fairly consistent for both groups.

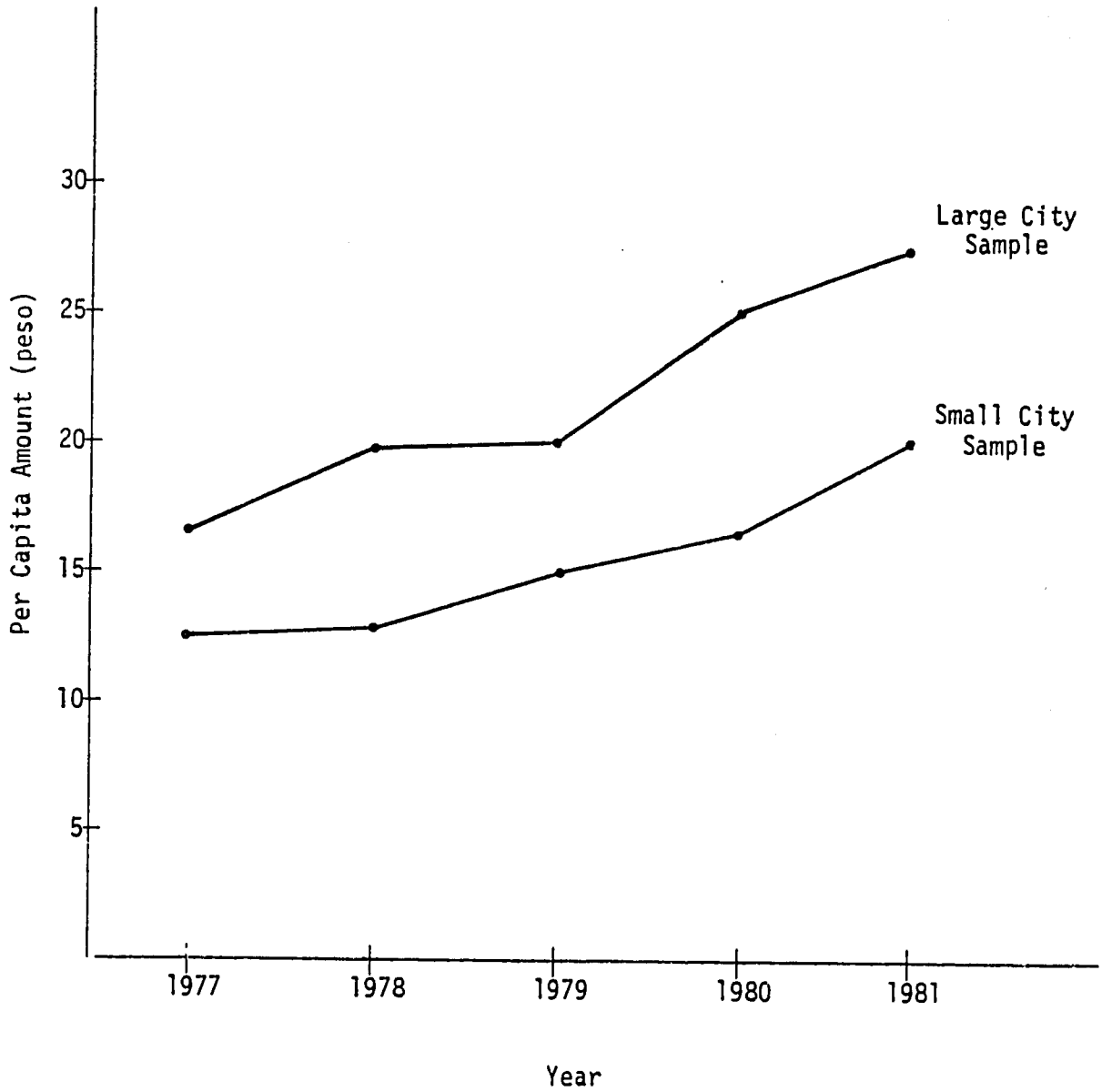
Figure 51

General Fund per Capita Expenditure
for Philippines Municipal Sample
(Philippine Pesos)

	1977	1978	1979	1980	1981
Total Sample	14.69	15.89	17.65	20.46	23.76
Small Cities	12.34	12.50	14.76	16.41	20.27
Large Cities	16.77	18.85	20.16	24.00	26.79

Figure 52

Graph of Per Capita Expenditure for
Philippines Municipal Samples



If we calculate a trendline using a two-year moving averages technique to smooth out some of the year-to-year fluctuations, we can also see what the rate of growth has been over the period (Figure 53). The calculations in Figure 53 show that the yearly growth rate has been about 13 percent for the small cities and 12 percent for the large cities. When we compare this to an average yearly inflation rate of over 17 percent during the period in the Philippines, we see that local governments have restricted growth in expenditures to less than the rate of inflation.

There are several things to take into account in interpreting the growth rate in expenditures versus the inflation rate. On the one hand, a growth rate slower than inflation could mean that the local governments are becoming more efficient, providing the same level of services for a lower "real" cost ("real" meaning that we have adjusted for inflation in the costs of goods and services.) On the other hand, the slower growth rate could mean that the quality of public services is declining.

We may now apply the technique for analyzing expenditure growth trends to the analysis of an individual municipality's performance. Figure 54 shows the per capita general fund expenditures for three municipalities from our Philippines small-city sample as well as the average for all of the small cities. We may calculate a trendline using the linear regression technique for each of the four sets of data, which is plotted on the graph in Figure 55.

The trendlines in Figure 55 reveal the following:

- The expenditures of Culasi started at a higher level and have grown at a more rapid rate than the other two municipalities and the average of all cities.
- The expenditures of Bugasong have started at a higher level than the average of all cities but have grown at a slower rate, ending at a lower level in 1981 than the average.

Figure 53

Two Year Moving Average of Philippines
Per Capita Expenditures Data

	77/78 Average	78/79 Average	79/80 Average	80/81 Average
Total sample	15.29	16.77	19.05	22.11
(Percent change from previous year)		9%	13%	16%
Small and Medium Cities	12.42	13.63	15.58	18.34
(Percent change from previous year)		9%	14%	17%
Large cities	17.81	19.50	22.08	25.39
(Percent change from previous year)		9%	13%	14%

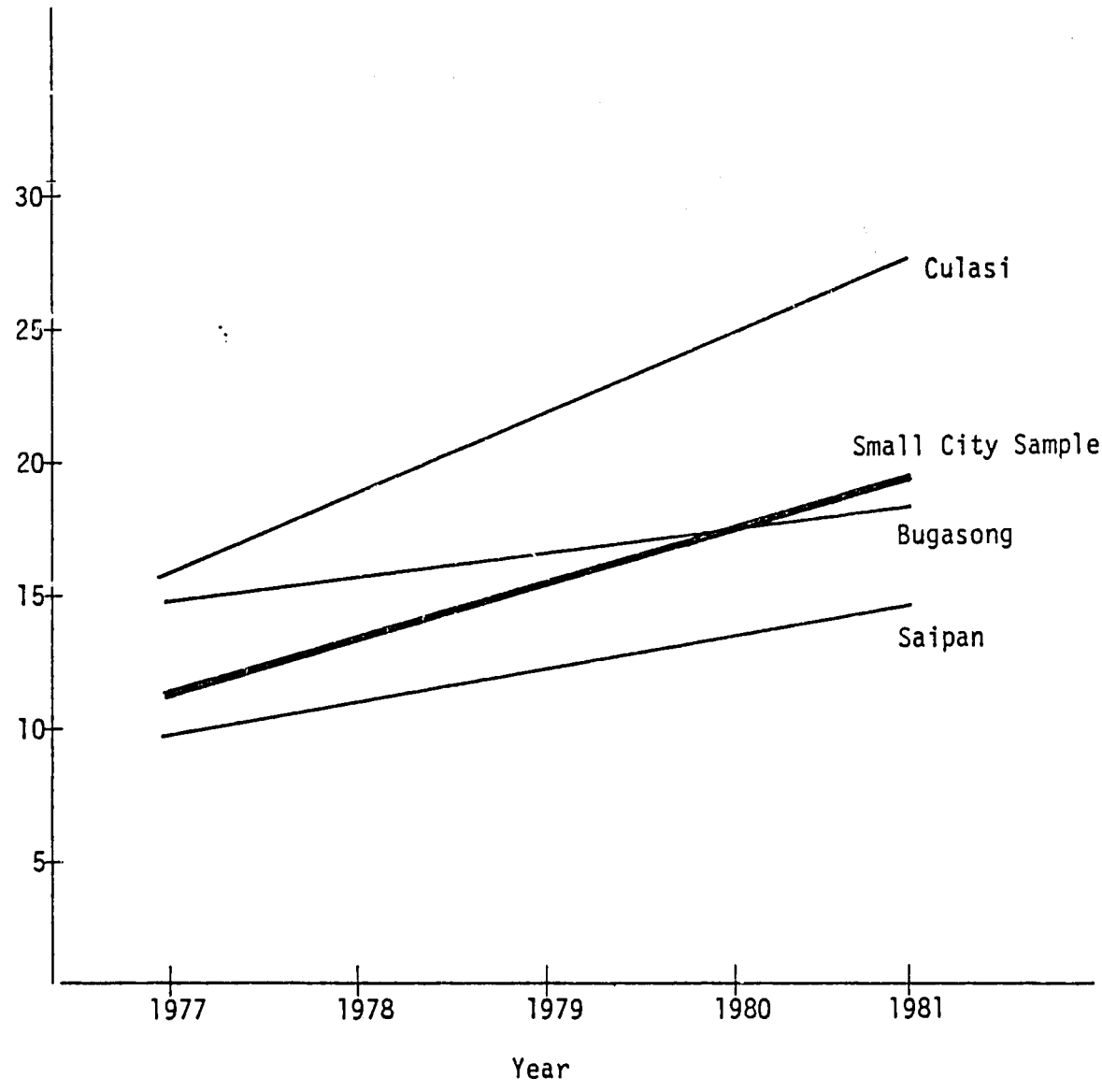
Figure 54

Per Capita Expenditures for Selected Municipalities
in Small City Sample, 1977 - 1981

	1977	1978	1979	1980	1981
Bugasong	15.19	15.97	15.07	17.37	19.38
Saipan	11.38	10.47	11.60	11.27	17.91
Culasi	15.99	16.56	23.05	21.06	28.92
Average of all small cities	12.34	12.50	14.76	16.41	20.27

Figure 55

Trendline per Capita Expenditures for
Three Cities and Small City Average



- Saipan has started at a slightly lower level and maintained about the same growth rate as the average.

- Although the population of Culasi puts it in the small city category, its expenditure performance is more consistent with the large city sample.

While the straight trendlines provide useful information for comparison, they can obscure useful information as well. For example, if we refer to Figure 51, we see that the rate of growth in expenditures has been steadily increasing during the time period. The rate of increase has been greatest for the small-city sample, reaching 24 percent between 1980 and 1981. Therefore, we should take into account this accelerating rate of increase when we project future expenditure trends.

4.3 Projecting Trends in Total Expenditures

In the chapter on revenue analyses we presented a technique for projecting future revenues on the basis of past revenue trendlines. This technique can also be used for projecting expenditure trends into the future and is calculated in exactly the same way. This type of projection assumes that the future conditions are much the same as in the past and, therefore, past performance is a good predictor of the future. How do we project future expenditure, or revenue, trends if we know conditions are going to change? For example, if we know that the wage rates of local government employees are going to be raised by 40 percent, can we assume that expenditures will rise by the same growth rate as in the past?

To deal with this type of situation, we must add to our trendline projection technique another type of technique, called Deterministic Analysis. Deterministic analysis simply means that we have additional information that will help us determine more precisely what changes in the growth rate will be; we do not need to rely solely on past trends to make the projection.

To illustrate how deterministic analysis works, we examine the information in Figure 56, which presents expenditure data for a typical municipality. The figure shows that personnel costs account for about 65 percent of local general fund expenditures. If we know that wage scales for local government employees have been frozen for the last four years, we see that the growth in personnel costs must be accounted for by growth in the number of employees. In calculating the percentage increase from year to year in Figure 56, we see that growth in both personnel and other costs have averaged 10 percent per year.

If we know that the announced government policy is to raise local government salaries by 20 percent next year, what should the impact on the municipality's general fund expenditures be?

Figure 56

Expenditures for Sample Municipality
for Four-Year Period

Expenditure Category	1980	1981	1982	1983
Personnel Costs				
Salaries	66,872	73,693	80,841	88,925
Pension contributions	5,851	6,204	6,063	7,781
Health/accident benefits	10,867	12,219	14,147	14,450
Rent/Utilities	11,699	14,312	15,320	18,222
Materials/ Minor Equipment	13,620	13,510	16,210	17,100
Services	7,613	8,110	10,690	11,212
Debt Repayment	9,204	9,962	10,010	11,300
Miscellaneous	2,874	3,572	2,280	2,672
Total Expenditures	128,600	141,582	155,561	171,662

Figure 57 shows how the question can be answered. The figure shows three different scenarios. The first shows the projected growth in expenditures using a simple trendline projection; this scenario simply assumes that the average growth rate of 10 percent on total expenditures will be maintained into the future. The second scenario assumes that (1) the growth of other costs will increase by the 10 percent average rate of growth that occurred in the past, (2) the number of employees will continue to increase by 10 percent as in the past, and (3) average wages of employees will go up by 20 percent in 1984 as promised in the new policy. The third scenario assumes the same actions as in the second scenario, with the exception that the number of employees is frozen at current levels.

The results of the three scenarios give us different predictions of 1984 expenditures for the municipality. Such scenarios are useful to give us, not so much a precise estimate, but a range of estimates within which we predict that the future expenditure amount will fall. In this way, we can use the scenarios to set upper and lower bounds on future expenditure projections. The use of these bounds is discussed further in Chapter 5 of this Handbook.

Figure 57

Alternative Growth Projections in
Expenditures Using Deterministic Analysis

1. Scenario A

Assume growth will continue at same rate as recorded in past (10%). Therefore, in 1984, expenditure will be:

171,662 x 110% = $188,828

2. Scenario B

Assume growth in non personnel costs to be 10%; number of employees increases by 10% and average wage increases by 20%:

Non personnel costs = 60,506 x 110% = 66,557

Personnel costs = 111,156 x 110% (growth in numbers) x 120% (growth in wages) = 146,726

Total expenditures = 66,557 + 146,726 = $213,283

3. Scenario C

Assume growth in non personnel costs to be 10%; number of personnel not increased but wages increase 20%:

Non personnel costs = 60,506 x 110% = 66,557

Personnel costs = 111,156 x 120% (wage increase) = 133,387

Total expenditures = 66,557 + 133,387 = $199,944

4.4 Analyzing Components of Expenditures

The analytical techniques presented thus far focus on total expenditures. In this section, we shall look at the components of those expenditures in more detail. We have already introduced this notion in the preceding section where personnel costs were used to project future expenditures.

Analyzing components of expenditures requires data on the details of those expenditures. The most useful types of analyses to carry out include

- Growth in personnel costs
- Growth in operation and maintenance expenses of capital investments
- Growth in general administrative costs.

4.4.1 Growth in Personnel Costs

There are two very useful sets of analyses of personnel costs. The first concerns the changes in the proportion of total expenditures accounted for by personnel over time. The second concerns the comparative costs of personnel across a group of municipalities. Figure 58 illustrates the analysis of changes in personnel costs of a single municipality over time.

Figure 58 shows that the proportion of total expenditures accounted for by personnel has risen from 56 percent to 63 percent over the five-year period. This observation should cause us to ask whether average salary costs are rising too fast or the number of employees is rising excessively.

From the information in the figure, we see that the number of employees has risen only 17.5 percent while total population in Nakuru has risen an estimated 36.4 percent over the same time period. Therefore, we conclude

Figure 58

Personnel Expenditures and Employment for Nakuru (Kenya) Municipal Council, 1971 and 1975

	1971	1975	Percent Increase 1971-75
Total Expenditures	449,480	787,477	75.2%
Personnel Expenditures	253,503	497,767	96.4%
Percentage of Total Expenditures Accounted for by Personnel	56.4%	63.2%	NA
Number of Employees	1,203	1,413	17.5%
Personnel Cost per Employee	KE 210.73	KE 352.28	67.2%
Percentage Increase in Inflation (Consumer Price Index)			62.3%
Population Growth Rate Over Period (Urban Population Growth for all Kenyan Cities)			36.4%

that the growth in the number of employees is not unreasonable, compared to overall population growth.

Second, we should examine the growth in the average costs per employee. We see that this growth has been about 67 percent while inflation has been 62 percent. Although slightly higher than inflation, the growth in average personnel costs is not out of line.

If growth in the number of employees and growth in average salary costs are not unreasonable, why is personnel taking a larger and larger share of total expenditures? The explanation must be that the Nakuru Municipal Council is keeping down the growth in other nonpersonnel costs, well below the current inflation rate. Indeed, if we calculate the growth in nonpersonnel costs, we see that they have increased only 47.8 percent over the time period.

A final question we should ask with respect to Nakuru's personnel costs is how reasonable those costs are compared to other municipalities in Kenya. We can best answer this question by examining data from other municipal councils. Figure 59 presents comparative data on personnel costs per capita and number of employees per thousand people. These standardized measures allow us to compare Nakuru's personnel costs to the costs of other municipal councils.

From Figure 59 we see that Nakuru has one of the lowest personnel costs per capita. We also see that Nakuru is about average in terms of number of employees per thousand population. This means that Nakuru's average salary costs must be lower than the other municipal councils taken as a group. Indeed, if we look at the municipalities with the highest <u>total</u> expenditures per capita (Kisumu, Eldoret, and Kitale), we see that those municipalities have the highest number of employees per capita. This means that total expenditures seem to be driven largely by personnel costs and that personnel costs are determined largely by the number of

Figure 59

Per Capita Personnel Expenditures for Major Municipal Councils, Kenya, 1975

	Nairobi	Mombasa	Kisumu	Nakuru	Eldoret	Thika	Kitale
Population (1975)	786,000	375,000	47,000	90,000	20,000	35,000	18,000
Total per capita current expenditures (K£)	12.08	7.60	14.70	8.70	17.50	10.84	15.12
Personnel expenditures per capita (K£)	6.72	4.92	9.17	5.49	11.11	6.18	8.62
Number of employees per capita	16.5	9.1	23.7	16.3	24.0	16.6	25.2

employees, not differences in wage scales. Therefore, controlling local government expenditures means first controlling the size of local government staffs.

NOTE: The user should be careful in collecting personnel data from local government records. There are several potential pitfalls which can bias the information. First, the local government staff may be composed of persons employed by the national civil service as well as the local government. Oftentimes, these figures are omitted from local personnel tallies. Second, local governments may have temporary, or part-time workers as well as full-time, permanent staff. These part-time workers may or may not be counted on local government records (or the total number of part-time employees may be recorded without any indication of how many hours, or "full-time equivalents," are actually provided.) This variability in recording personnel can produce unreliable data unless the person collecting the data anticipates these pitfalls. Therefore, it is important to obtain estimates of the total, full-time equivalent workforce for personnel cost analyses.

4.4.2 Growth in Operation and Maintenance Costs

Operation and maintenance (O&M) costs are components of local government expenditures that are often ignored or kept at a level that prevents adequate upkeep of capital investments. In short, O&M expenditures should not be minimized if public services are to be maintained at adequate levels.

O&M expenditures should reflect levels of previous capital investments. This is particularly true of capital investments that expand existing service facilities rather than replacement. Expanded facilities will require additional O&M expenditures while replacement investment will likely continue or even decrease future O&M costs. If capital investments

for expansion have been heavy in the recent past, we would expect O&M expenditures to rise in the near future. Figure 60 illustrates this phenomenon of the "lag" time effect between expansion capital investments and O&M expenditures. The figure shows that we should project a rapid increase in O&M expenditures in the period 1982 through 1985 on the basis of heavy capital investments in the period three years earlier.

While it is easy to see the link between capital investment and future O&M costs conceptually, it is more difficult to translate that into a precise estimate of the impact of capital investment on the current expenditure budget of a local government. The reason for this difficulty is that O&M costs are not a single block of expenditures but are spread throughout the operating budgets of local government departments. Furthermore, different types of capital investments will have very different impacts on future O&M expenditures.

Because of these reasons, it is hard to provide precise rules for forecasting the impact of a given level of capital investment on future expenditure levels. Other than dealing with this issue on an individual case-by-case basis, the best we can do is anticipate the impact of different levels of capital investments on the rate of growth in total levels of current expenditures.

To estimate the impact of capital investment on the rate of growth of current expenditures, we need several years of historical data on capital investment levels, the nature of the investment (expansion vs. replacement), and levels of current operating expenditures. Figure 61 provides data to illustrate this analysis.

In examining the information in the figure, we first look at the trends in the current expenditures. We see that during the period 1975 to 1978,

Figure 60

Example of Delayed Impact of Capital Investment (Expansion)
on Operations and Maintenance Expenditures

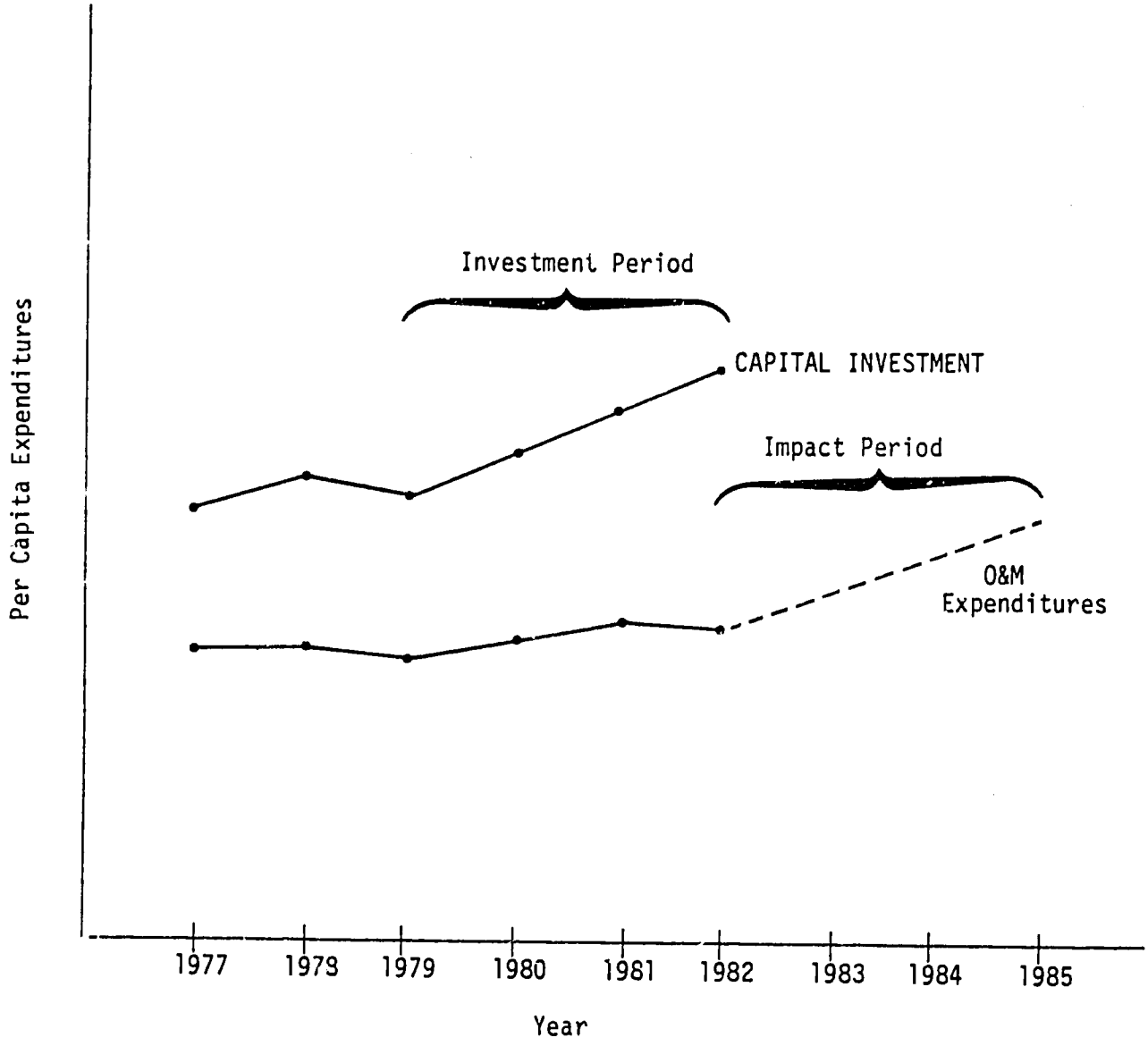


Figure 61

Capital Investment and Expenditure Data
from Sample Municipality
(1975 to 1983)

	1975	1976	1977	1978	1979	1980	1981	1982	1983
Capital Investment	1,100	1,000	1,200	1,440	1,800	2,340	3,510	4,914	6,684
% Increase from Previous Year	---	-9%	20%	20%	25%	28%	50%	40%	35%
Current Expenditures	2,000	2,180	2,420	2,710	3,090	3,553	4,122	4,780	5,498
% Increase from Previous Year	---	9%	11%	12%	14%	15%	16%	16%	15%

current expenditures rose about 10 percent per year. From 1979 to 1983, current expenditures rose 15 to 16 percent per year.

Capital investment levels fluctuated more than the levels of the current expenditures. From 1976 to 1978, capital investments rose about 20 percent per year. From 1979 to 1983, the rate of yearly increase was between 30 and 50 percent. This indicates that the yearly rate of increase in current expenditures is likely to rise beyond the 16 percent level already noted for the period 1979-83. The information at hand does not permit us to estimate how much of an increase to expect. At best we can only estimate that the existing rate of increase will accelerate. Although this analysis does not give us all the information we would like, it is useful information in that it gives us a lower bound for future current expenditure estimates.

4.4.3 Administrative Costs versus Direct Costs of Services

One method of categorizing operating costs of local government is to divide these costs into: (1) direct costs of providing public services and (2) administrative costs of running the local government. The direct costs of services are those expenditures that are directly related to the provision of a public service. For example, the costs of pumping equipment, fuel, and salaries of employees who operate the municipal waterworks are direct costs of providing water. On the other hand, administering local government has costs that cannot be assigned to the production or delivery of an individual service; these are called administrative costs.

Administrative costs are a legitimate cost of providing municipal services; however, many times they are not well controlled and, in some cases, can dwarf the expenditures incurred in actually providing public services. Since citizens equate their tax payments with public services

that they receive, a local government that spends too much in administration and not enough in providing services will likely encounter taxpayer resistance.

Administrative costs should be monitored, particularly as a proportion to the direct costs of providing services. Figure 62 shows the percentage distribution of expenditures for municipal governments in Kenya for the years 1975, 1977, and 1979. This figure shows us first whether the amount spent on administration has changed over the period. From the information in Figure 62, we see that the proportion taken by administration has remained relatively constant over the five-year period.

We may also use the information in Figure 62 for comparative purposes in examining the performance of individual municipalities. Figure 63 shows the composition of expenditures for the largest municipalities in Kenya in 1975. We see that the percentage of total expenditures devoted to administration varies from a low of 6.2 percent (Nakuru) to a high of 21.0 percent (Kitale). If we compare this to the average of 11 to 12 percent shown in Figure 62, we see that several municipalities are devoting much more than expected to administrative expenses. This would suggest that those Kenyan municipalities with administrative expenses greater than 12 percent of total expenditures should examine closely what those expenditures are really buying.

It should be noted that the three cities with the highest proportion of administrative expenses (Kisumu, Eldoret, and Kitale) also were seen to have the highest per capita expenditures and the most employees per capita as well (see Section 4.4.1). This suggests that these three cities are not only overspending, but are overstaffed in positions that are not directly producing public services.

Figure 62

Percentage Breakdown of Kenyan Municipal Council's Expenditures by Service Delivery Area 1975, 1977 and 1979

Service	1975	1977	1979
Administration	12.5%	10.9%	11.2%
Community Services			
Road	5.5	5.9	5.5
Sanitation	10.9	15.4	13.5
Other	4.3	3.4	3.9
Social Services			
Health	11.6	10.2	11.4
Education	18.4	16.3	16.8
Other	1.2	1.2	1.6
Economic Services			
General Administration	3.6	3.2	3.2
Water System	10.0	12.8	15.1
Housing Estates	17.7	17.0	13.3
Other	4.2	3.6	4.9
TOTAL	100.0%	100.0%	100.0%

Figure 63

Percent Distribution of Expenditures for
Major Municipal Councils of Kenya, 1975

	Nairobi	Mombasa	Kisumu	Nakuru	Eldoret	Thika	Kitale
Percent distribution of expenditure (1975)							
Education	30.5	31.0	21.9	44.3	24.5	29.0	35.3
Health	34.5	25.2	30.9	25.4	25.4	17.4	12.1
Works	16.1	29.6	21.5	18.2	23.6	27.4	22.1
Social services	9.8	3.0	7.5	6.0	8.5	12.7	9.6
Administration	9.1	11.2	18.2	6.2	18.2	13.1	21.0
	100.0	100.0	100.0	100.0	100.0	100.0	100.0

4.5 Analyzing Unit Costs of Local Services

The expenditure analyses thus far have focused on overall expenditure performance of municipalities and what makes up those expenditures. In this section we develop ways to analyze the performance of individual municipal services, particularly those that charge user fees.

The most basic measure of municipal service performance is the cost per unit of service delivered. This requires that we have information on the amount of service provided and the expenditures incurred in providing it. For some services the unit of service delivered is relatively straightforward, such as the amount of water pumped or the amount of refuse collected. For other services (and even for the two services mentioned above), measures of service delivered may not be that easy to obtain. In these cases, we may need to use some other, less direct measure, such as the number of households served.

Once we have some measure of the service output, we need to obtain data on the cost of providing the service. Data for services in which expenditures are accounted for by individual funds are easy to obtain. However, for others, complete figures may not be available. In these cases, we may use another measure such as number of staff personnel employed in that service as a substitute measure.

Once we have both service output measures and measures of expenditures (or a substitute measure) we can construct a ratio of the service output per unit of expenditure. Figure 64 shows some examples of performance measures for different types of public services. Please note that these measures are all shown as a ratio -- i.e., a unit of service output PER some unit of service expenditure.

Figure 64

Examples of Service Measures

Municipal Service	Service Performance Measure
Water Supply	1. amount of water pumped per dollar spent
	2. number of households served per employee in the water department
	3. number of households served per dollar spent
Refuse Collection	1. amount of refuse collected per dollar spent
	2. number of households served per dollar spent
	3. number of households served per employee in the collection department
Road Maintenance	1. length of roadways maintained per dollar spent
	2. length of roadways maintained per employee in the road maintenance department
Public Markets	1. number of market stalls per dollar spent
	2. number of market stalls maintained per employee in department
	3. square footage of market area constructed per dollar of construction cost

We can now use these measures for analysis to see how the individual services are performing. We will use these measures for two types of analyses:

- Single-City Analysis: comparing changes in performance from year to year to monitor improvement or decline.
- Multi-city Analysis: comparing performance ratios among cities to see where individual city performance can be improved.

4.5.1 Single City Performance Analysis

In analyzing the performance of a municipal service of a single city, we must examine changes in the performance indicator(s) over time. Figure 65 provides an example of how we would construct some performance measures for data on a municipal water system. The example shows two ratios that can be constructed from the data in the table: (1) households served per $100 spent, and (2) households served per employee of the water authority. We use "households served" as the measure of service output, since we do not have data on the actual amount of water delivered. If we had that type of data, it would give us a more precise measure; however, for comparative purposes, the per household measure is adequate.

We can perform two types of analyses with the data in Figure 65. First, we should examine the changes in our two ratios over time. In our example, we see that both ratios are declining. We would expect Ratio 1 to decline over time since the inflation rate of 7 percent annually means that the water authority should spend 7 percent more money each year to produce the same level of service if it maintains the same level of efficiency. On the other hand, we would not expect Ratio 2 to be affected by inflation; therefore, any decline in Ratio 2 indicates a lessening efficiency in the performance of the water authority.

Figure 65

Performance Measures of Typical
Municipal Water System

	1978	1979	1980	1981	1982
Number of households served by water system	25,500	25,500	28,000	28,000	29,400
Total expenditures by water department	300,000	32,700	394,000	430,700	498,300
Number of employees	200	220	245	270	298
Ratio 1: Households served per $100 spent	8.5	7.8	7.1	6.5	5.9
Ratio 2: Households served per emoloyee	127.5	115.9	114.3	103.7	98.7

In examining the performance of Ratio 1, we may compensate for inflation by calculating how Ratio 1 should perform, taking into account inflation. Figure 66 shows this simple calculation. Even after adjusting for inflation, we see that the decline in Ratio 1 is still positive, indicating that there was a decline in performance. This is consistent with the findings from our examination of Ratio 2. Indeed, the fact that Ratio 2 fell so far over the time period suggests that a contributing factor was that the authority hired too many additional staff. In order for the authority to make the ratio of staff to households the same in 1982 as it was in 1978, the authority would have to reduce its staff to about 230 people.

4.5.2 Multi-City Analysis of Service Performance

In addition to monitoring performance of a single-service agency over time, we can also compare performance measures among cities. This allows us to determine how municipalities are performing with respect to each other, not just whether they are improving or declining with respect to their own past performance levels.

Multi-city comparative analysis is quite simple, requiring only that we develop performance measures for a group of municipalities and compare them. In this sense, we would apply the same types of judgments that we use when comparing revenue or expenditure performance across cities. In this case, we compare one of the performance measure ratios instead of the per capita revenue or expenditure figure.

Such comparisons can be carried out on a number of different types of performance measures, as shown in Figure 64. These comparisons across a number of cities can provide very useful information on normal levels of expenditures on a standardized basis. Like the per capita revenue and expenditure analyses, these comparisons can be used by local governments

Figure 66

Adjustments to Performance Ratio to Compensate for Inflation

	Base Year 1978	1979	1980	1981	1982
Ratio 1: Households served per $100 expenditure	8.50				
Inflation rate (percent change from previous year)		7.00%	6.00%	8.00%	9.00%
Adjusted Ratio*	8.50	7.94	7.49	6.94	6.36
Actual ratio 1 recorded from Figure 64)	8.50	7.80	7.10	6.50	5.90

* Calculated by increasing the denominator (1978 expenditures) in the ratio calculation by the inflation rate while holding the numerator (1978 number of households served) constant.

to identify where costs are out of line and where significant improvements are likely to be made.

The following case study illustrates the application of a multi-city comparison of performance measures based on data from a sample of medium-sized Korean cities.

CASE STUDY: Municipal Services Performance Measurement

This case study illustrates the development and use of performance measures for local water systems in Korea. Water service lends itself to this type of analysis since it involves provision of a commodity that is readily measured and typically is priced on a unit basis.

Figure 67 presents data from a group of medium-sized Korean cities on the costs and service output of municipal water systems for the year 1981. Korea is a particularly rich source of data on municipal service performance because the Ministry of Home Affairs assembles extensive data on municipal services, revenues, and expenditures for all local governments in the country on a yearly basis.

The data in Figure 67 may be converted into service performance indicators by creating selected ratios, as shown in Figure 68. The first ratio shown, expenditures per ton, is created by dividing the total yearly expenditures by the annual consumption (daily consumption times 365 days). The second ratio, consumption per household per day, is created by dividing the daily consumption by the number of households. The third ratio, expenditures per household per day, is simply the product of the first two ratios.

The expenditure per ton ratio shows how efficient the municipal water system is in delivering water. We see in our sample of six cities that Jeonju appears to be several times more efficient than Anyang and Bucheon. We cannot tell from the data why one city is more efficient than another. This does, however, tell us that we should examine the cost components of water service in Jeonju compared to the cost factors for Anyang and Bucheon as the next step in determining how to make municipal water service more cost efficient.

Figure 67

Data from Sample of Korean Cities
on Water Supply, 1981

	No. Households Receiving Water	Total Operating Expenditures (1000 won)	Average Amount of Water Distributed Daily (m tons)
Suweon	47,096	1,714,788	32,400
Seongnam	74,060	2,529,758	42,340
Anyang	32,400	2,070,399	21,800
Bucheon	25,600	1,723,693	20,000
Cheongju	38,990	2,578,412	38,932
Jeonju	58,000	1,621,892	61,000

Figure 68

Comparative Performance Measures of
Water Services for Six Korean Cities, 1981

	Expenditure/ m ton (won)	Consumption/ HH/day (m ton)	Expenditures/ HH/day (won)
Suweon	145.00	.688	99.75
Seongnam	163.69	.572	93.58
Anyong	260.20	.673	175.07
Bucheon	236.12	.781	184.47
Cheongju	181.45	.999	180.85
Jeonju	72.40	1.052	76.14

If we examine the ratio expenditures per household per day, we see that two groupings emerge from our six-city sample. One group is composed of those three cities with expenditures in the range of 76 to 99, while the other group is clustered in the 175 to 185 range. Are there any differences between the two groups that could affect costs of water service?

While our sample of six cities is too small to make any valid generalizations, we note that the cities with the highest expenditure per household have the smallest number of households served (Figure 66). This suggests that the number of households, or density of dwellings, may be a critical factor in determining service costs per household.

This quick examination of the performance measures has provided us with three important types of information:

- There is significant variation in costs per unit of service and expenditures per household; this tells us that there should be a basis for improving efficiency in water service delivery among the high-cost cities.
- The analysis has pinpointed where the differences in performance appear greatest, indicating which cities we should investigate to uncover the reasons for the differences.
- The analysis suggests that number of households in the system has an impact on costs per unit of service; this "economy of scale" suggests that systems below a certain size will have to carry higher user charges or require a public subsidy to operate.

CHAPTER 5
FINANCIAL BALANCE ANALYSIS

Financial balance analysis puts together revenue and expenditure analyses to develop an overall picture of the fiscal well-being of the local government. We are particularly concerned with analyzing the trend in budget surpluses or deficits and in forecasting future financial balance. This chapter covers the following topics:

5.1 Projecting Financial Surpluses and Deficits

- using straight trendline projections
- using ranges and alternative scenarios

5.2 Adjustments to Financial Balance Projections

- treatment of borrowing in revenue and expenditure forecasts
- treatment of other nonrecurring revenues

5.3 Analysis of Debt-Carrying Capacity

- calculating net costs, or revenues, of capital investments
- analyzing impact of debt in terms of:
  - current revenue stream
  - expected revenue increases (revenue potential)
  - future cash flow
- using debt impact analysis to:
  - set limits on debt burden
  - redesign loan package

5.4 Flow of Funds Analysis

- national level analysis
- municipal level analysis involving interfund transfers

5.5 Carrying Out Financial Analysis

- how to get started
- conducting summary financial analyses
  - national level
  - individual municipal level.

The first three sections present analytical techniques for dealing with different aspects of financial balance; the fourth section, summary financial balance analysis, shows how we select a starting point for conducting a financial analysis. This final section shows how to use selected analytical techniques presented in earlier chapters to conduct quick overviews of financial status.

5.1 Projecting Financial Surpluses and Deficits

This section brings together the projection techniques already developed for projecting revenues and expenditures in the earlier chapters. In the revenue analysis chapter we presented the concept of trend analysis to identify the underlying trends over several years and the techniques for projecting those trends into the future. This approach gave us a single trendline for future projections. In the expenditure analysis chapter, we introduced the concept of projecting multiple future trends, based on possible changes in the underlying assumptions about expenditure factors. These multiple forecasts define a RANGE of possible future expenditure patterns.

We will now put together both concepts, projecting ranges for both expenditures and revenues into the future. Figure 69 presents data on revenues and expenditures of a municipality to illustrate this analysis. Also included in the figure is revenue potential data, based on the techniques of revenue potential analysis presented in Chapter 3. The reader should recall that the "revenue potential" is an estimate of what a locality should be able to collect for certain revenue sources, if they performed as well as the better performing municipalities in the country.

We may use the revenue and expenditure data for Municipality X for the five-year period to develop straight trendline projections for the next four years. As we did in the trend projection exercises in Chapter 3, we use a simple linear regression technique to establish a trendline. These projections are shown on the graph in Figure 70. The graph shows a worsening financial balance because local revenue increases are not keeping up with expenditure trends.

We may consider these projections as "baseline" projections since they show what should happen if current trends continue. However, we know from the revenue potential analysis that Municipality X has considerable room

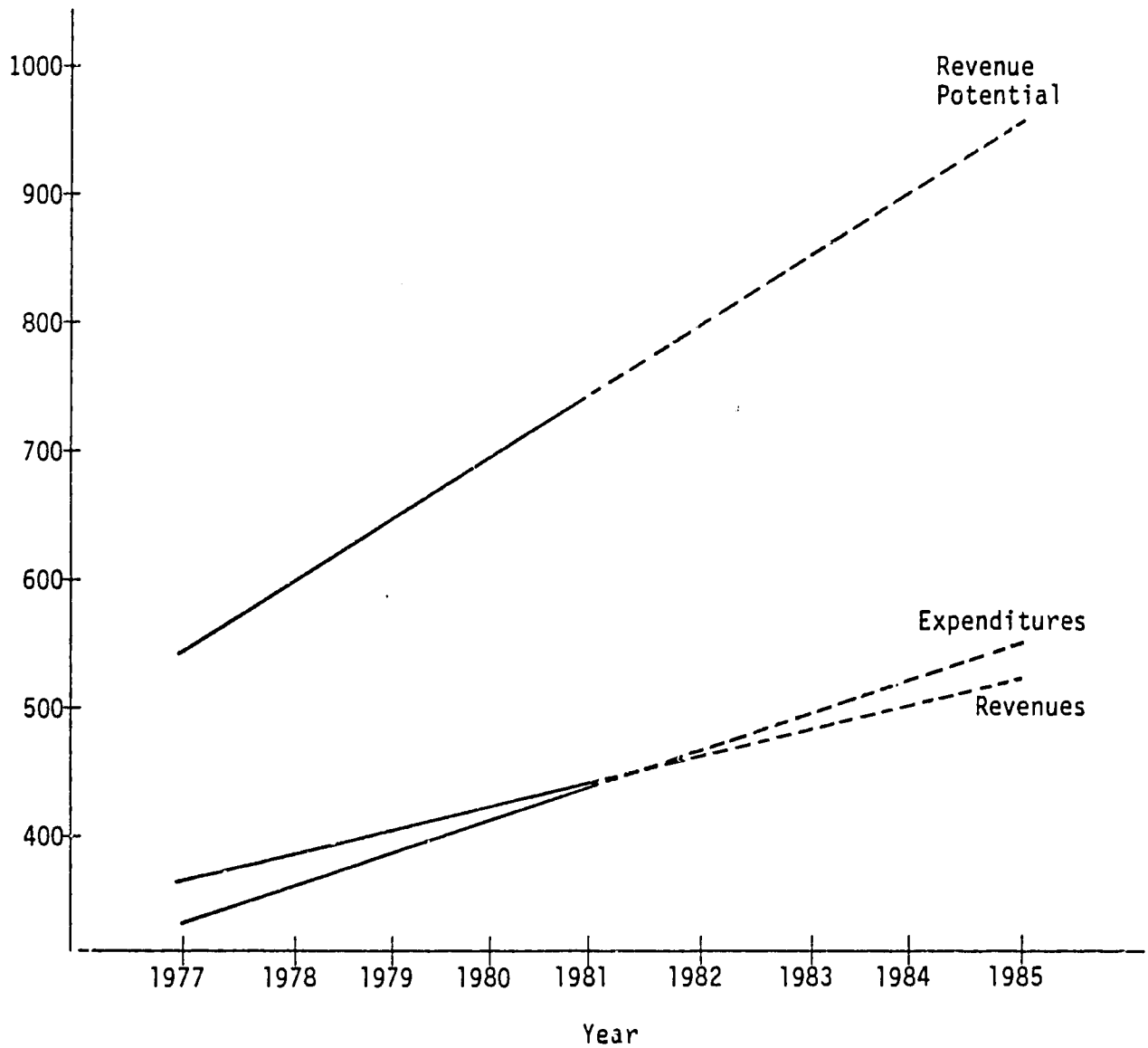
Figure 69

Illustrative Revenue and Expenditure Data
from Sample Municipality X, 1977 - 1981

	1977	1978	1979	1980	1981
A. Population	21,000	21,810	22,714	23,622	28,567
B. Local revenues	151,200	163,800	179,441	193,700	251,390
C. Central government grants	226,800	226,200	228,379	227,388	199,005
D. Total revenues (B + C)	378,000	390,000	407,820	421,088	450,395
E. Total expenditures	346,500	377,685	396,570	420,364	453,995
F. Local revenue/ capita (B/A)	7.2	7.5	7.9	8.2	8.8
G. Revenue potential target per capita*	14.8	16.0	16.3	16.9	19.4
H. Total additional revenue potential (G - F) x A	159,600	185,640	190,798	205,511	260,410

Figure 70

Graph Showing Trend Projections of Revenues, Expenditures, and Revenue Potential for 1982 - 1985



for improvement in raising revenues. On the other hand, we know that local government expenditures are very sensitive to wage rate increases; a large wage increase could also drive expenditures up. For these reasons, we should also try to project the range of future revenue and expenditure amounts in addition to the baseline trends.

To project alternative revenue amounts, we should use as a guide the revenue potential estimates. We do not think that Municipality X could be expected to achieve the total revenue potential, given (1) that the revenue potential represents what the best performing cities are achieving and (2) Municipality X's performance is quite low compared to the revenue potential target. Therefore, we will assume that Municipality X should be able to achieve half of its revenue potential and that this improvement will not happen all at once, but will be spread over a four-year period. With these assumptions we can establish a new revenue projection, as shown in Figure 71.

Figure 71 also shows a new expenditure projection, based on the assumption that wage rates will rise in the first year of the projection; after that, expenditures will resume the same rate of growth experienced in the past. These alternative projections of revenues and expenditures can be used with the baseline projections in Figure 70 to define the ranges in which we expect revenues and expenditures to fall. Figure 72 shows these two ranges created by putting the two sets of projections together.

Figure 72 can be used by officials in Municipality X for some basic fiscal planning. We see that expenditures will exceed revenues in 1982 if the large wage increase is granted, even if the municipality meets its revenue increase target for that year. The municipality has two options:

1. It can grant a wage increase tied to the level of revenues, so there is no deficit created; this means that the wage increase would not go into effect until the end of the year when revenue receipts could be totaled.

Figure 71

Alternative Trend Projections for
Revenues and Expenditures for Municipality X

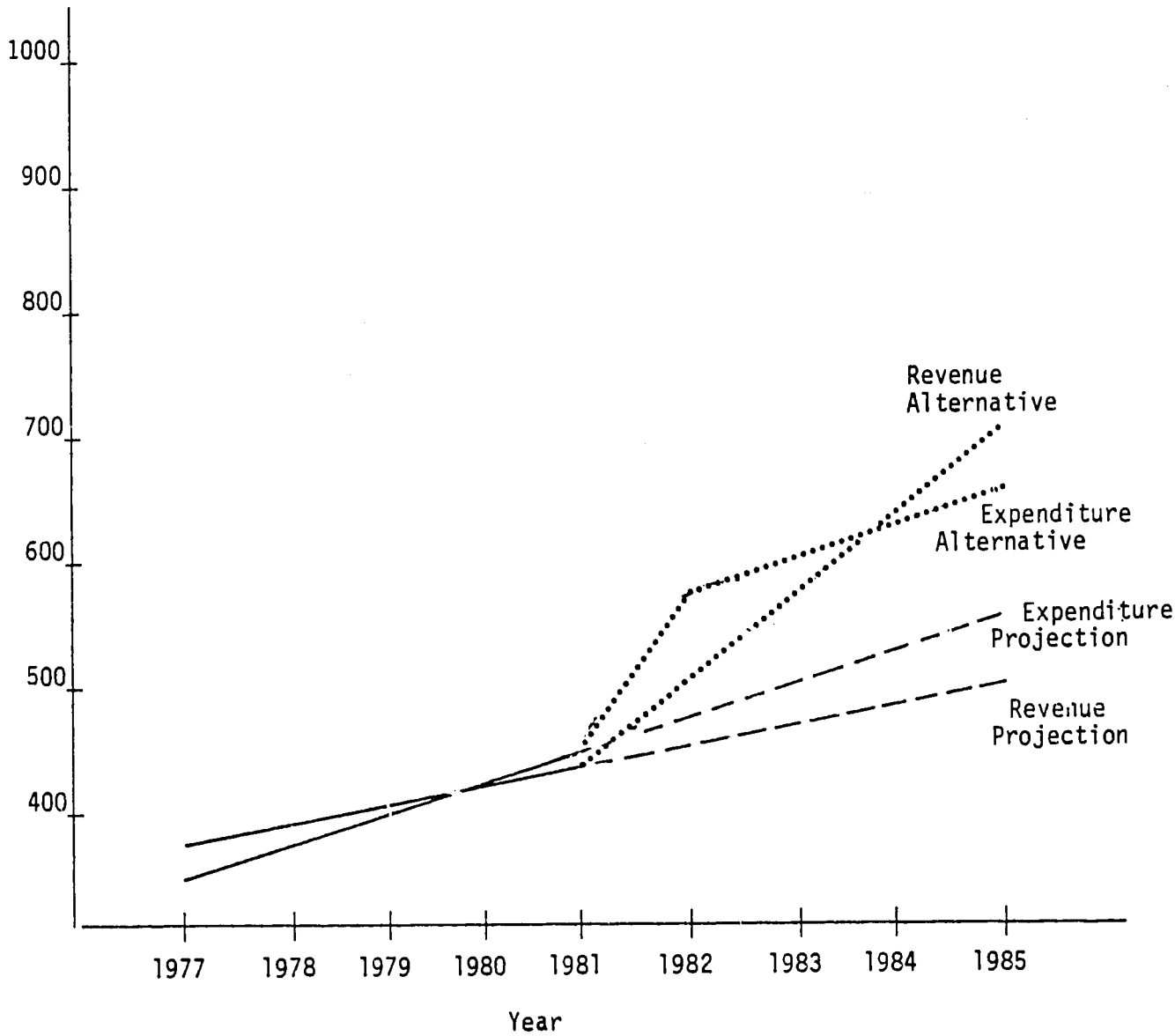
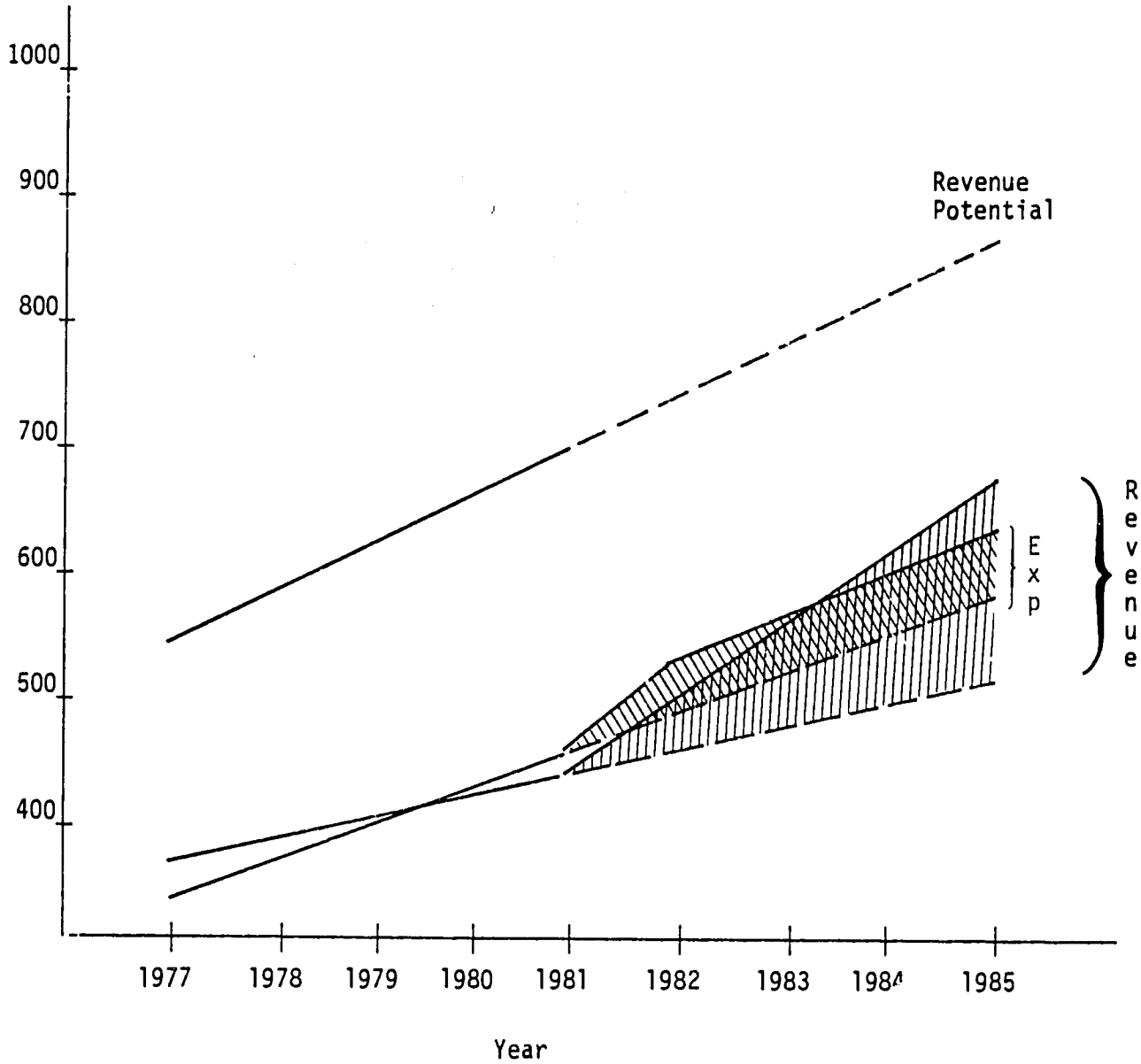


Figure 72

Expected Ranges of Revenues and Expenditures for
Municipality X, 1982 - 1985



2. The municipality could assume that it would meet its revenue potential targets, creating budget surpluses in years 1983 to 1985; these surpluses would be used to offset the deficit in 1982.

Clearly, Option 2 is more risky financially and depends on meeting the projected revenue targets. Option 1, on the other hand, ties salaries to revenue performance. In a sense, this introduces a tangible incentive for municipal worker performance. At the very least, it makes difficult the creation of budget deficits through wage raises.

5.2 Adjustments to Financial Balance Projections

There are often special "events" in the revenue or expenditure history of a municipality that distort the past revenue and expenditure trends. This makes it difficult to forecast accurately the future trends on the basis of past experience. The major problems are found with (1) revenues from borrowing and (2) other "one-time" revenue windfalls.

Borrowing creates several effects which complicate forecasting financial balance analysis. First, borrowing inflates the revenue figures when the borrowed amount is credited to the municipality's account. Second, the borrowed amount has to be repaid at some future time, increasing future expenditures. If these effects are not accounted for in the analysis of revenue and expenditure trends, forecasts of future financial balance can be greatly distorted.

Figure 73 presents data on municipal revenues and expenditures, including borrowing, with which we will illustrate the impact of borrowing on financial balance projections. We will use the linear regression technique to develop trendlines of total revenues and expenditures and will extend these trends into the future. This is shown graphically in Figure 74. The graph indicates a small, but steady surplus in future years.

However, if we adjust the revenue figures by subtracting the amount borrowed, we have a much more accurate basis for projecting future revenue trends. By the same token, we need to adjust the expenditure forecast to account for the loan repayment, beginning in the year 1984. This produces a much different forecast of financial balance, as shown in Figure 75. The impact on the financial balance projections shows up dramatically when we graph the adjusted projections (Figure 76).

Figure 73

Illustration of Revenue and Expenditure Data for a Sample Municipality Including Borrowing and Ad Hoc Grants

	1979	1980	1981	1982	1983
Local revenues	190,000	204,500	219,700	229,300	235,000
Central government tranfers:					
- share of national taxes	300,000	305,000	310,000	329,000	330,000
- ad hoc grants	100,000	60,000	0	0	0
Borrowing*	0	0	100,000	100,000	100,000
Total revenues	590,000	569,500	629,700	649,300	665,000
Total expenditures	580,000	560,100	612,200	646,000	660,100

* three (3) year grace period on loan repayment

Figure 74

Graph of Revenues/Expenditures Projections Without Impact of Loan Payment Included

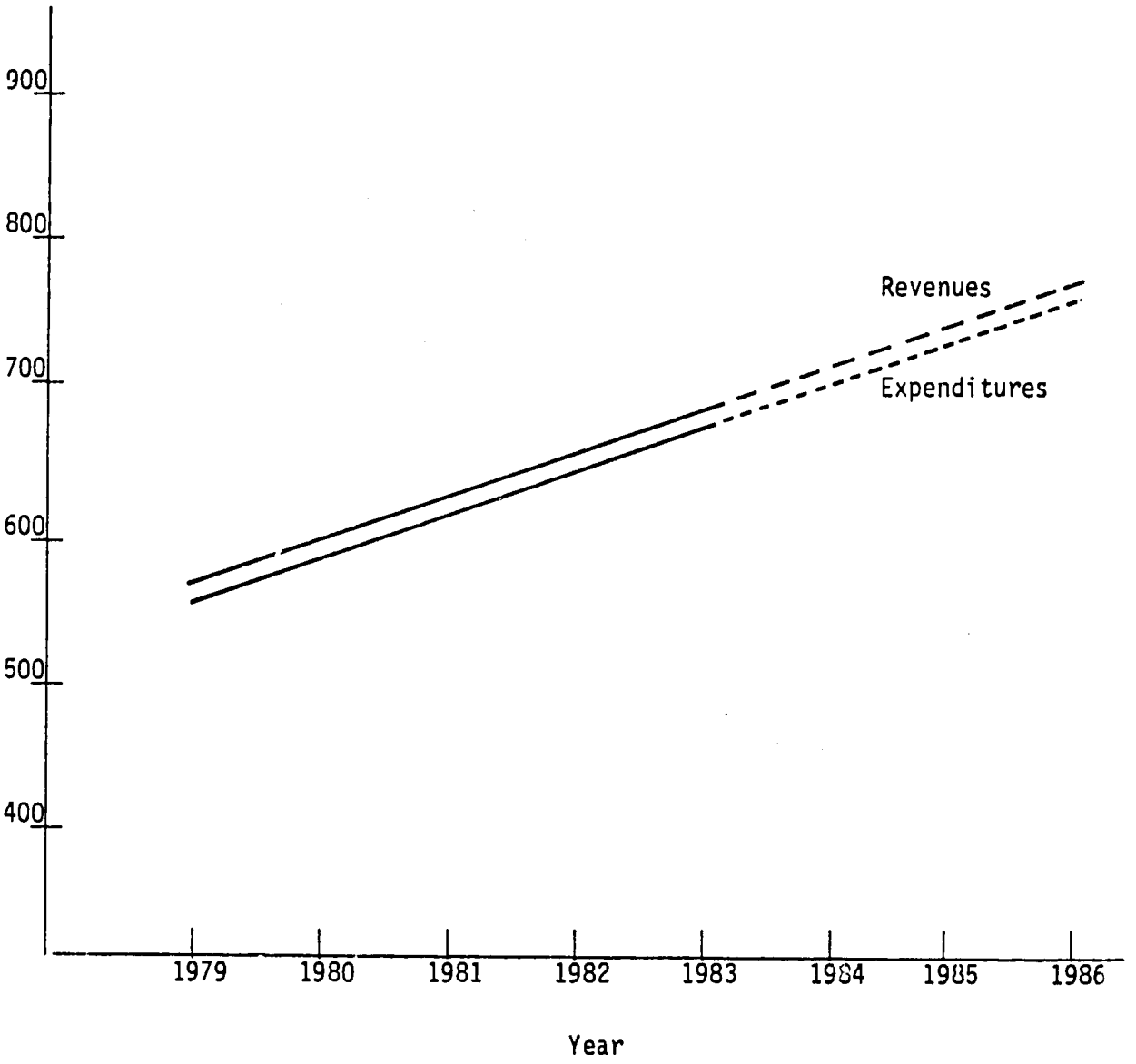


Figure 75

Projection of Revenues and Expenditures
Showing Impact of Loan Repayment

		1984	1985	1986
A.	Revenue without borrowing	585,640	604,620	623,600
B.	Expenditures (Baseline Projections)	723,006	769,420	815,834
C.	Loan payments	15,858 1/	31,716 2/	47,574 3/
D.	Total expenditures (B + C)	738,864	801,136	863,308
	Deficit (D - A)	153,224	196,516	239,708

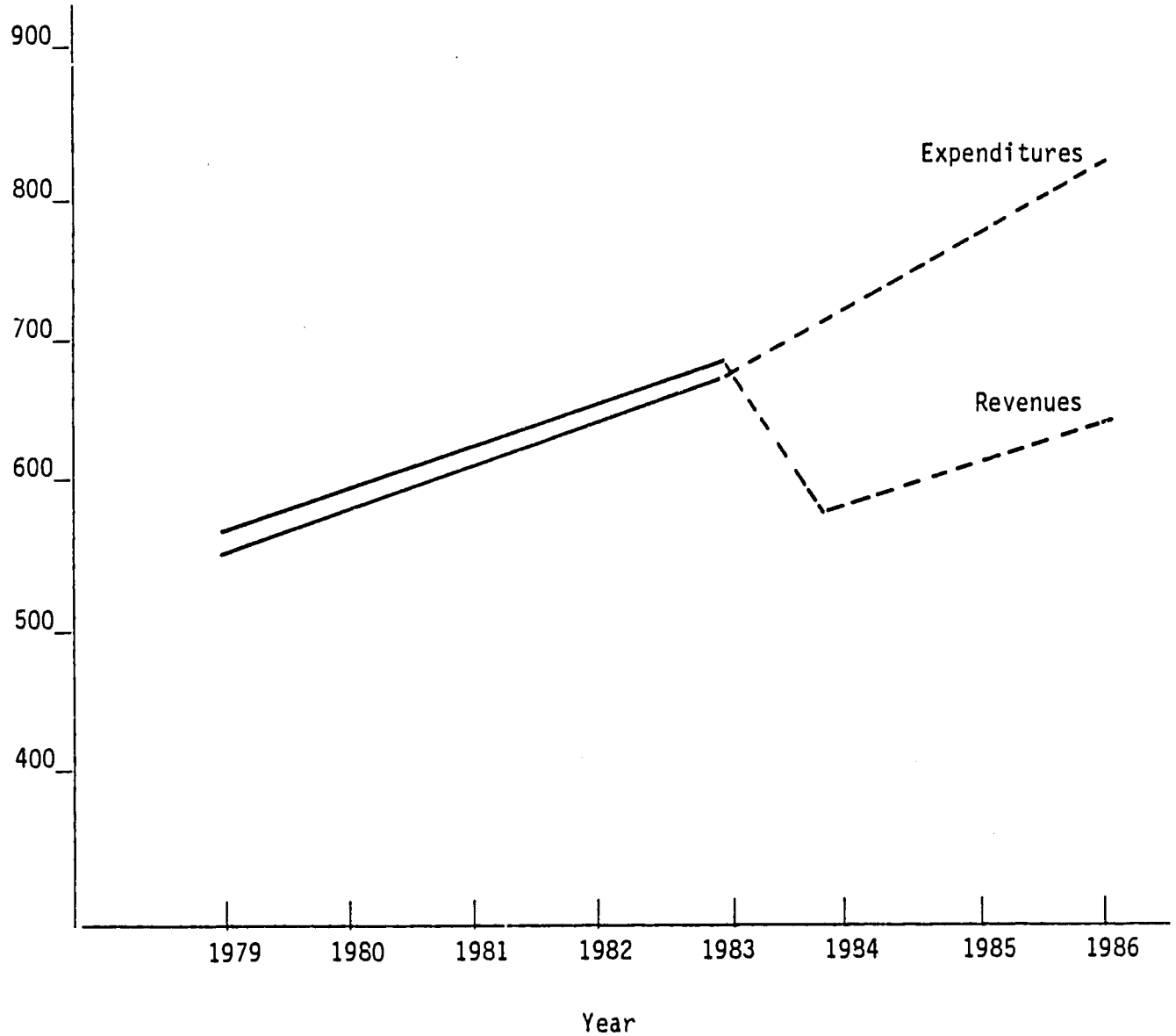
1/ Includes payment on $100,000 loan in 1981, amortized over ten years at 10 percent.

2/ Includes payment on $200,000 loan total (1981 and 1982) at same rate

3/ Includes payment on $300,000 loan total (1981, 1982, and 1983)

Figure 76

Projected Revenue and Expenditures
Showing Impact of Loan Repayment



The treatment of borrowing discussed above should also be used with other types of activities that increase revenues temporarily but cannot be counted on as a permanent revenue source. These revenue sources all have the effect of distorting the long-term picture of financial balance. Included in this category of revenues are

- Sale of municipal property
- Ad hoc grants from the central government
- Borrowing from other local government accounts.

Each of these types of activities has the effect of raising total revenues for a given time period without increasing the underlying revenue base. If these "distortions" are not accounted for in making financial balance projections, we will almost certainly overestimate future budget surpluses (or underestimate deficits).

5.3 Analysis of Debt Carrying Capacity

The preceding discussion leads naturally into a consideration of how to determine the debt-carrying capacity of a municipality. In many countries, there is a ceiling placed on the amount of debt a local government may carry. In addition to legal limitation, however, there are some techniques for assessing how much debt a local government can reasonably handle.

First, we should emphasize that there are no hard rules for establishing a precise debt limit. This analysis requires a considerable amount of judgment, aided by the analytical techniques presented below.

In examining debt-carrying capacity of local government, we are purposefully avoiding the more traditional financial analysis measures of debt-to-equity comparisons. We find that such measures are fraught with measurement problems and do not address the real issue, which is that local government generates revenues from taxing authority, not from physical assets of the local government.

The analysis of debt-carrying capacity requires that we put together many of the analyses already carried out in the preceding sections of this Handbook. First, we need to examine the way in which the debt will be used. If it is for a capital investment, we need to know:

- What are the expected operation and maintenance costs in the future years?
- What is the amount of debt repayment? When will repayment begin and for how many years?
- Will the investment generate any revenues? How much can be expected annually and when will the revenue flow begin?

Answers to these questions will enable us to adjust revenue and expenditure projections in the future to account for the financial impact of the specific investment. If the investment produces revenues as well as expenditures, we are concerned with the NET impact -- i.e., the difference between costs and revenues of the investment project.

The other side of the coin is the capacity of the local government to deal with the impact of the debt. To examine this question, we need to perform a financial balance analysis similar to the one presented in the preceding section where the ranges of alternative revenue and expenditure projections were analyzed. We are particularly interested in two aspects:

1. The amount that local revenues will have to be increased to cover the net costs of the investment (debt payment plus O&M costs less revenues generated)

2. Assuming some potential for raising local revenues in general, how much of the estimated revenue potential would be consumed by the net cost of the investment.

We are concerned here with the year-to-year impact on financial balance (often referred to as cash flow impact), not just the total impact over the life of the debt/investment. We may illustrate how to carry out such analyses by using the data on revenues and expenditures and revenue potential of Municipality X presented in Figure 69. To this data we add a hypothetical investment, showing the expected costs and revenues generated by the investment (Figure 77).

The figure shows, first of all, projected local revenues using a simple trendline projection based on the historic data in Figure 68. The figure also shows the costs and revenues of the investment as well as the net cost for each year.

The figure also shows the percentage that the projected local revenues would have to be increased in each of the four years to cover the net

Figure 77

Impact of Investment on Local Revenues

	1982	1983	1984	1985
A. Local Revenue Baseline Projection (from data in Figure 69)	263,959	277,157	291,015	305,566
Investment Impact				
B. Costs: Loan payment and maintenance	50,000	100,000	100,000	100,000
C. Revenues generated	0	30,000	70,000	70,000
D. Net cost (B - C)	- 50,000	- 70,000	-30,000	-30,000
E. Net costs as percentage of local revenue (D/A)	18.9%	25.3%	10.3%	9.8%
F. Additional revenues that could be collected if ½ revenue potential is reached over four years (from Figure 71)	27,085	61,439	95,793	130,147
G. Cumulative net cost of investment (from line D)	- 50,000	- 120,000	- 150,000	- 180,000
H. Cumulative additional revenues from revenue potential	27,085	88,524	184,317	314,464

costs of the investment. We note that this percentage is quite large, particularly since it represents an amount in addition to an underlying rate of growth in revenues of about 13 percent a year (the growth rate calculated in our trendline projection).

Figure 77 also shows the additional revenue that we estimate could be collected if the municipality improved its revenue collections in line with the revenue potential analysis in Figure 71. The reader should keep in mind that the revenue potential target used in Figure 71 is fairly conservative, assuming that only half of the computed revenue potential will be achieved over a four-year period.

The Figure shows the cumulative revenue potential and the cumulative net costs of the investment. Comparing the two, we see that it will take three years of meeting the revenue increase targets before the cumulative net costs of the investment are matched. This means that it would not be until 1987 before the costs of the investment can be offset by improved revenue collections.

Local officials can use this type of information in several ways. First, officials can use the analysis to weight that "burden" of the proposed investment. The analysis indicates that the investment will consume virtually all of the revenue increases that the municipality could expect to achieve over the first three years of a concerted drive to improve collections. The question to the municipal officials is, do they want to commit all of their potential revenue improvements to that single investment?

Second, the net costs of the investment will throw the city into a budget deficit unless revenues increase substantially, i.e., at a rate considerably above the already projected 13 percent per year. The analysis shows that local revenues will have to rise from the projected baseline about 20 percent in the first year, 25 percent in the second, and

10 percent in subsequent years. Even though the potential for revenue increases appears to be substantial, the fact is that these increases are speculative at this point. The local officials cannot be certain that such improvements can be realized. Do they want to take such a risk on an untested assumption?

Third, even with great improvement in revenue collection, it is clear that the proposed loan repayment schedule would leave the municipality with a budget deficit in the first two years. This suggests that the local officials may want to negotiate lower loan payments at the outset, or a several years' grace period.

Finally, the local officials may wish to reconsider the size of the investment. The net costs are quite high because revenues generated by the investment will not recover the recurrent costs. The municipality may wish to reduce the net costs by reducing the size of the investment or by increasing the revenues generated by the investment.

For example, if the investment is to generate user charges, such as a water system or municipal market, the rate structure may need to be revised. Indeed, the local officials may use the information in our analysis to set a ceiling amount for the size of deficit to be subsidized by public funds. For example, they may decide that the subsidy amount for the particular investment should not exceed 30 percent of the potential revenue increase; the rest would have to be recovered from user charges.

From the standpoint of the lending agency, the analysis raises several questions as well. First, the lender must be concerned that the debt service requirements represent such a burden on local revenues. Given the municipality's relatively poor performance in the past, this should raise serious doubts about the chances for repayment. Indeed, as the local officials may adopt a ceiling on the subsidy to be provided, the lending agency may wish to set its own limitations as well.

Second, since the ability to repay the loan is predicated on substantial revenue increases, the lending agency may want to see proof that the local government can indeed raise more revenues. This suggests that the lending agency may want to defer the loan for one year while it sees if the municipality can improve its revenue performance in line with its targets. This deferral would have two attributes: (1) it would give the municipality time to demonstrate improvement in revenue generation and (2) it would allow the municipality to generate a surplus that could be used to decrease the amount borrowed for the investment.

5.4 Flow of Funds Analysis

The Flow of Funds Analysis is concerned with the ability of local governments to raise local revenues to cover the operating expenses of the local government. This analysis examines the source of total budget funds (locally raised versus external transfers and borrowing) and matches those sources to the major division of expenditures (current operating versus capital investment.)

Underlying this analysis is the assumption that, in most countries, local governments are intended to cover their general operating expenditures from locally raised revenues, reserving central grants for capital investments. This assumption may not hold true for all countries, but the premise that local governments should become more self-sufficient in meeting operating expenditures is widely held, even in countries where central governments provide general budget support to local governments. Even in these situations, the tendency is toward more local responsibility for financial self-sufficiency.

The concept underlying flow of funds analysis is straightforward. It entails tracking the proportion of local vs. external sources of revenue and matching those to operating vs. capital expenditures. We are interested in examining the trend over time, to see whether the local government is becoming more or less dependent on external sources for general operating budgets.

5.4.1 National Level Flow of Funds Analysis

Flow of funds analysis can be carried out by individual municipalities or at the regional or national level. It is particularly relevant at the national level as a measure of conformance with national fiscal policy.

This is most pertinent where national policy is to decentralize the responsibility for financing local public services to local governments.

Following is a case study using flow of funds analysis for Ecuadorian municipalities. The analysis was carried out as the first step in planning a national program to strengthen local government finance. The strengthening program has been brought about by the realization that central government grants, funded by oil revenues, could not continue to grow.

CASE STUDY: Flow of Funds Analysis

In order to carry out a flow of funds analysis at the national level it is necessary to assemble data on (1) total revenues available to municipalities, and (2) total expenditures of the municipalities. We should keep in mind that "revenues available" may greatly exceed "expenditures" if the funds available for transfer to local governments are not used by local governments; this is often the case where the transfers are intended for capital investments and the local governments cannot develop suitable projects for funding.

Figure 78 presents the flow of funds analysis for Ecuadorian municipalities in 1981. Perhaps the most striking feature of this figure is the very high level of dependency of Ecuadorian municipalities on central government transfers and borrowing. Local own-source revenues (2.3 billion sucres) represent only 82 percent of current expenses (2.8 billion sucres).

Current expenditures generally must be used for the operation and maintenance of past investments, as well as for the general administrative expenses of municipal government. Although they may not be sufficient to provide for supporting municipal growth, generally they should be sufficient to keep the municipality running. Because most municipalities generally meet their payrolls and other administrative expenses before providing for the operation and maintenance of existing infrastructure, Ecuadorian municipalities were highly dependent on transfers in 1981 in order to operate and maintain their capital stock properly.

From a general examination of Figure 78, we may expect to find many municipalities with past capital investments (in such areas as water and sanitation systems) in serious states of disrepair. Because municipalities had not properly operated and maintained these systems, their economic life (duration of productive use) was less than it could

Figure 78

Municipal Flow of Funds Analysis

National Level: Ecuador - 1981
(Ecuadorian Sucres)

Revenues Available		Expenditures Made	
Own Source	2.3 billion	Current Expenses	2.8 billion
Borrowing	3.0 billion	Debt Service	1.5 billion
Central Transfers	6.0 billion	Other	0.7 billion
		Capital Investments	4.3 billion
TOTAL	11.3 billion	TOTAL	9.3 billion

have been. This generally means that new investments for system recuperation, as well as expansion, must be made sooner than normal. Because investments are usually financed, at least in part, by borrowing, poor operation and maintenance performance generally results in higher debt service, and these systems cost much more than they would have if they had been properly maintained.

It is generally healthy for municipalities to have sufficient own-source revenues to provide for debt service expenses. As demonstrated in Figure 78, however, debt service alone would absorb 65 percent of total own-source revenues. Combining current expenses with debt service (4.3 billion sucres) as representative of expenditures that a municipality wishing to be in a relatively autonomous financial position should be able to self-finance, it may be noted that Ecuadorian municipalities provided only 53 percent of this amount in own-source revenues. To keep their government and services running, as well as to honor their loan obligations, Ecuadorian municipalities had to look to external sources of revenues.

Thus, in 1981, Ecuadorian municipalities were heavily dependent on central government transfers and borrowing to sustain current levels of service. If either external revenue source were to become less available, and if municipalities could not or would not increase their local own-source revenues, then it may be expected that local service systems would be capable of producing less services, and eventually might collapse altogether.

It may also be noted from Figure 78 that municipalities have been heavily dependent on borrowing. Debt service was greater than half as large as current expenditures, and it represented 16 percent of total municipal expenditures in 1981. New borrowing also was very heavy, accounting for almost one-third of total revenues. Thus, future debt service obligations will tend to increase over the 1981 level, draining resources from

operation and maintenance of these investments as well as new investments. Unless own-source and/or transfer revenues increase, the proportion of total expenditures dedicated to productive activities will tend to decrease, and the cycle of poor operation and maintenance leading to higher and higher debt service (resulting in decreasing capacity to operate and maintain investments financed by borrowing) will continue and worsen.

Finally, it may be noted from Figure 78 that total revenues available in 1981 (11.3 billion sucres) were less that total expenditures made (9.3 billion sucres). This occurred because a substantial amount of central transfers were reserved for capital expenditures for which acceptable projects must be presented before release of the transfers. Because of the poor management capability of many municipalities, acceptable projects were not developed, and these municipalities received less transfers than were provided for in the central government budget.

5.4.2 Municipal Level Flow of Funds Analysis

The flow of funds analysis may also be conducted at the municipal level. In the municipal analysis, we are still concerned with the dependency of local government on external sources of revenue but an additional concern is that for transfers between funds in the local budget. This type of analysis is particularly useful where the local budget structure has several accounts with transfers allowed among accounts. Although such transfers may be prohibited by law, interfund "borrowing" may be practiced anyway.

Figure 79 provides a five-year, simplified flow of funds analysis for an individual municipality. In this case, municipal finances are classified according to two funds. The general fund supports the general administration of the municipality, as well as all services for which no

Figure 79

Municipal Flow of Funds Analysis
Local Level: 1979 - 1983

	1979	1980	1981	1982	1983
A. GENERAL FUND					
1. Revenues	10,250	9,800	13,960	14,350	15,600
Own Source	4,200	4,300	4,350	4,500	4,700
Borrowing	----	100	2,510	1,850	7,400
Central Transfers	6,050	5,400	6,100	8,000	3,500
2. Expenditures	11,400	12,200	13,100	13,900	14,500
3. Interfund Transfers To (+) or from (-) Service or cash reserves	- 1,150	- 2,400	- 140	+ 450	+ 1,100
B. SERVICE FUNDS					
1. Water System Account					
Revenues	1,850	1,950	1,990	2,150	2,300
Expenditures	2,100	2,550	3,250	3,600	3,900
Surplus (+) or deficit (-)	- 250	- 600	- 1,260	- 1,450	- 1,600
2. Housing Account					
Revenues	7,200	7,250	7,350	7,500	7,800
Expenditures	4,700	5,100	6,200	6,500	7,300
Surplus (+) or deficit (-)	+ 2,500	+ 2,150	+ 1,150	+ 1,000	+ 500
C. CASH RESERVE	1,100	250	----	----	----
(End of year: transfered to next budget year)					

user charge is made for service cost recovery. These services include public street lighting and waste disposal, street construction and maintenance, primary education and public health and safety.

General fund revenues are classified as local own-source, borrowing, and transfers from the central government. Subtracting expenditures from revenues presents the net general fund's impact on the service fund. This net impact is termed "interfund transfers." When the general fund has a surplus, this may be: (1) transferred to one or more service fund accounts during the current budget period or (2) placed in a cash reserve account available for general or service funds during the next budget period. When the general fund has a deficit, it must receive a surplus from the service fund if the total municipal budget is to be balanced.

The service fund is composed of municipal services for which user fees are charged. In the case of Figure 79, there are two services in which there is a direct link between expenditures for service delivery and payments for services received: water and housing. As with the case of the general fund, each service fund account may have a surplus or deficit, but the sum of all deficits and surpluses over both funds and the cash reserve account must be zero if the total municipal budget is to be balanced.

In the exhibit, several trends may be observed. Both the general fund and the water system account had generally increasing deficits over the 1979-1983 period. In both cases, expenditures presented consistent increases. For the general fund, own-source revenues remained fairly steady, but central transfers were irregular. This imbalance was partially compensated for through borrowing, although this of course produced additional debt service expenditures.

The housing account demonstrated consistent but decreasing surpluses. Together with borrowing, the housing account surplus was able to balance the deficits generated by the general fund and the water system account.

In general, the flow of funds analysis of the municipality in Figure 79 appears to indicate a deteriorating financial management situation. How serious the situation is would need to be determined through more detailed analysis of the local situation. For example, the general fund's own-source revenues have presented a low bouyancy. With increasing expenditures and irregular central transfers, this produces demand for interfund transfers and borrowing. This demand may be reduced through improved own-source revenues and/or improved expenditure efficiency, in which the same level of services may be produced more cheaply.

The water system account shows a higher rate of increase in expenditures than in revenues. Here, the expenditure level may or may not be adequate to operate and maintain the system properly. If it is not, we may expect some near-term borrowing for system recuperation that, if water revenues are not increased, will produce additional demand on housing account surpluses.

As for the housing account, this has produced a consistent but declining surplus. Revenues were consistently higher than expenditures. This may mean that housing was truly a profitable activity for the municipality which, in turn, allowed for the subsidizing of other municipal services. Or, expenditures for the housing account may not have provided for a sustainable program. For example, these expenditures may have just provided for operation of the housing program, to the neglect of proper maintenance. Or, expenditures may not have taken into account replacement and depreciation expenses. Although the flow of funds analysis does not provide the answers to these financial management questions, it does serve as a guide to setting the agenda for questions to be answered through more detailed examination of the municipality's status.

5.5 Carrying Out Financial Analysis

5.5.1 How to Get Started

This final section is concerned with how to apply the techniques that have been presented in the preceding chapters. A large number of techniques have been presented. Not all will be applicable to any one situation. Indeed, it may be overwhelming to many local government officials to even consider undertaking such a range of financial analyses.

With this problem in mind, we propose two alternative strategies to getting started. First, if a community has a particular financial management problem, one can go to that part of the Handbook dealing with the problem and start from that point. For example, if you are concerned with improving property tax yield, you can go to Section 3.1.1. The analysis will specify the types of data that are needed as well as the procedures. Again, we stress that the reader should become familiar with the entire content and approach of the Handbook before attempting to use the techniques.

In addition to targeting specific analyses to carry out, the user may also carry out a "summary" financial analysis as a means of getting started. A summary analysis can be used as an initial assessment of overall conditions in municipal finance in order to target specific problem areas for further analysis. Additionally, the summary analysis can be used when there is neither time nor resources for a more thorough analysis.

Although a summary analysis is, by definition, not an in-depth examination, in fact, it uses the same analytical techniques described in the preceding chapters, only in a more abbreviated manner. Therefore, one should have a clear understanding of the analytical techniques presented above before carrying out a summary analysis.

Carrying out a summary analysis is, first of all, dependent on the types of data available. In a summary analysis, there is no need for extensive data collection with emphasis placed on using the data at hand. The basic data requirements include: (1) the most recent several years' data on revenues and expenditures and (2) population and inflation estimates corresponding to those years.

Summary analyses may be carried out at the national or local level. A national level analysis is concerned with the overall condition of local government finance in a country (or even within a region of the country). The local level analysis is focused on an individual municipality or local government. Separate discussions of conducting summary analyses at the national and local levels follow.

5.5.2 National Level Summary Analysis

For a national analysis, we need to define precisely the target group for the analysis. The target group can be (1) all municipalities or (2) a subgroup of local governments, such as municipalities of a certain size or those in a certain region of the country. As we discussed above, municipalities of different sizes, or in different regions of a country, can have very different financial characteristics and problems. Even if we have selected all municipalities as the target group, we may wish to run separate analyses on important subgroupings. An example of target subgroups is the sample of large and small Philippine cities used in the revenue and expenditure analyses above.

Once the target group for analysis has been selected, we need to assemble the necessary data. If the target group is very large, we may assemble data on a sample of municipalities rather than all the municipalities in the group. However, the sample should be selected in such a way that it is representative of the total target group.

Assembling data for a national analysis is not difficult if you know where to look for the data. Revenue and expenditure data are almost always reported to a central government ministry which has oversight responsibility for local government fiscal affairs. These data can usually be found at one of three places: Ministry of Finance, Ministry of Interior, or Ministry of Local Government. Occasionally, the data may be published in statistical yearbooks.

Population statistics are generally available from central statistical offices, census bureaus, or economic planning agencies. If precise yearly estimates are not available, they may be estimated by applying population growth factors to the most recent population estimate for the municipalities under study.

For national level analysis, we work with AGGREGATE DATA -- that is, we sum the figures for revenues and expenditures of our target group. To calculate per capita amounts for the aggregate data, we then divide by the total population of our target group as well.

The analytical techniques used in the summary analysis are selected from the set of techniques already presented in the preceding chapters of this Handbook. The reader is advised to review the presentation and discussion in the earlier chapters as each technique is cited here. In this section, we will not repeat the presentation and application of techniques that have already been covered.

The goal of a national summary financial analysis is to acquire an understanding of the current and prospective status of local government finances in the target country. We may translate this general goal into several concrete objectives:

- To determine whether local governments are becoming more or less dependent on national grants

- To determine what national aid is being used for
- To identify which revenue sources are most important among locally-raised revenues and what changes are occurring in the composition of revenues
- To determine how fast local revenues and expenditures are growing compared to inflation
- To assess the financial balance trends in local government finances
- To determine which revenue sources have the greatest potential for improvement.

These questions define an outline for a national level summary financial analysis. The first question concerning dependence on national grants can be answered by examining the changes in the composition of total revenues of local governments, focusing on the percentage contributed by central government grants versus local revenues. This analysis is presented in Section 3.2.2 of the Handbook.

To determine what central government is being used for (support of operating expenditures versus capital investment) one should carry out a flow of funds analysis, as presented in Section 5.4.1. The analysis should be carried out for several years' data to determine any trends.

To identify which revenue sources are most important in local government budgets, we should examine the changing composition of local revenues over several years to identify those that constitute the major portion of local revenues and the changing composition (percentages) over time. This is identical to the analysis conducted in Section 3.2.2.

To determine the growth rates of expenditures and revenues, we must translate our revenue and expenditure figures into per capita amounts. Remember that we are working with aggregate data, so the per capita figures are based on the total of the target group.

To examine growth rates of revenues and expenditures, we should develop straight trendlines based on several years' data. The calculation of trendlines using regression analysis techniques is presented in Section 3.2.2. These trendlines should be plotted on a graph which also has the inflation trendline plotted for the same years. We can then compare the trendlines of the revenue and expenditure data with the inflation trend, as we did in the case application in sections 3.2.2 and 4.2 above.

The trendlines plotted above can also be used for financial balance projections by extending them several years into the future as described in Section 5.1. This indicates what should be happening in terms of financial balance if present trends continue. For a summary analysis, this simplified financial balance projection should suffice. However, if more information is available on prospective changes in either revenue raising authority or expenditure patterns, additional scenarios can be constructed, as described in section 4.3.

To determine which sources of local revenue can be increased most, we would need to perform a revenue potential analysis, as presented in section 3.2.3 above. This analysis necessarily has to be performed on disaggregated data -- that is, on individual data of each municipality in the target group. This analysis will show how much additional revenue should be collected for each revenue source by each municipality. We can total the amounts for each revenue source to see which sources hold the largest potential payoff.

Figure 80 summarizes the types of analyses, and their location in the Handbook, needed to carry out national level summary analysis. These analyses can be carried out quickly with data available at the national level. They reveal considerable information about the state of local government finances in a country, where help may be needed, and where improvements are likely to pay off in the short run. Such a summary analysis may be used effectively as the initial needs assessment in a more

Figure 80

Type and Location of Analyses Required to Conduct Summary Financial Analysis at the National Level

Question	Type of Analysis	Handbook Section
1. Are local governments becoming more or less dependent on central government transfers?	Change in percentage composition of local revenues vs. national transfers over time	3.2.2
2. What are central government transfers being used for?	Flow of funds analysis	5.4.1
3. Which local revenues are most important and how is the composition changing over time?	Trends and changes in percentage composition among local revenue sources	3.2.1 3.2.2
4. How fast are revenues and expenditures growing compared to inflation?	Calculation of trendlines using linear regression techniques	3.2.2 4.2
5. What is the trend in financial balance over time?	Projection of trendlines of revenues and expenditures into future	5.1
6. Which revenues sources have the greatest potential for improvement?	Revenue potential analysis	3.2.3

ambitious program of strengthening municipal finance in a developing country.

5.5.3 Local Level Summary Financial Analysis

A summary financial analysis at the local municipal level is similar to the national level analysis in the types of questions that are asked. Here, however, we are not primarily concerned with national trends and changing dependency on central government transfers, but with the municipality's financial balance, changing importance of individual revenue and expenditure categories, and opportunities for increased revenue generation.

In order to analyze financial balance, we must develop trendlines for recorded revenues and expenditures, based on several years' data. The calculation of trendlines using regression analysis techniques is presented in section 3.2.2 above. These trendlines should be plotted on a graph which also has the inflation trendline plotted for the same years. We can then compare the trendlines of the revenue and expenditure data with each other, as well as, with the inflation trend, as we did in the case applications in sections 3.2.2 and 4.2 above.

In order to understand what is contributing to the financial balance equation, we should also examine the composition of revenues and expenditures and the growth trends among the major revenue and expenditure categories. This type of analysis has been presented separately for revenues and expenditures above in sections 3.1.1 and 4.2 respectively. The analysis are then combined to examine overall financial balance in Section 5.1.

We may also project financial balance several years into the future to see what is likely to happen if current trends continue. The projection

techniques using the extension of the trendlines are discussed in sections 3.2.4 and 4.3, as well as in 5.1.

In order to determine which revenue sources can be increased, we can perform either a revenue potential analysis (section 3.2.3) or an analysis of expected growth in revenues given a baseline year (section 3.1.2). The revenue potential analysis requires comparative data from other similar cities, while the expected growth analysis can be conducted on data from just the municipality under study.

The summary analysis of a local government's finances should indicate the overall fiscal position of the local government, contributors to that financial balance, and most likely sources of additional revenues. As in the national level summary analysis, this overview can be used as an initial assessment to point the way to further investigation. Figure 81 summarizes the types of analyses, and their location in the Handbook, needed to conduct a municipal level summary analysis

Figure 81

Type and Location of Analyses Required to Perform
Summary Financial Analysis at the Municipal Level

Question	Type of Analysis	Handbook Section
1. Is there an underlying pattern of growth, or change in revenues and expenditures?	Trend analysis of local revenues and expenditures	3.2.2 4.2
2. What are the most important sources of revenues and are they changing over time?	Analysis of revenue composition	3.1.1
3. What are the major categories of expenditure and are they changing over time?	Analysis of expenditure composition	4.2
4. What is the past trend in financial balance and can that be projected into the future?	Projection of financial balance trends and adjustments to financial balance	5.1 5.2
5. Which revenue sources are not performing as well as expected and where can revenues be increased?	Analysis of expected growth in revenues Revenue potential analysis	3.1.2 3.2.3

APPENDICES

• Glossary of Financial Management Terms

A. Revenue Sources

1. Local Taxes - the most common types of taxes available to local governments include:

- Property Taxes: taxes placed on the value of (a) real estate and (b) other personal property. Property tax administration involves several steps including:

  * valuation of the property

  * imposition of the tax rate

  * notification of the tax owed by the property owner

  * collection of the tax

  * enforcement of penalties for nonpayment

Real property taxes may be based on three methods of valuation:

1. annual rental value - an estimate of the rent that the property would command on a yearly basis

2. capital value - an estimate of the total market value of land and buildings

3. site value - an estimate of the market value of the land only

- Business Activity Taxes: Taxes placed on the volume of sales or services provided by business firms. Tax may be based on a (a) percentage of gross receipts (where available), (b) where gross receipts information is not available, some other indicator of business activity such as floor area or electricity consumption, or (c) flat rate for businesses in similar size/volume categories.

- Per Capita Taxes: Taxes placed on each adult in the municipality, often with different rates for men and women. Sometimes, this tax is combined with an occupation tax which results in persons with different occupations paying different rates.

- Income Taxes: Taxes placed on the income of individuals; this tax may be based on (a) the actual income of an

individual (where available) or (b) the occupational class of the person, in which case it is called on occupation tax.

- General Sales Taxes: Taxes placed on the sale of all goods, usually on the total value of the sale; some items (such as food) may be exempted from the general sales tax for social reasons. A subset of sales taxes are transfer taxes on the sale, or transfer, of certain types of property from one owner to another; this usally applies to large or expensive items such as real property or automobiles.

- Excise Taxes: Special taxes placed on certain classes of goods (in addition to sales taxes) usually considered to be luxury goods such as tobacco and alcohol.

- Agricultural Production Taxes: Taxes placed on the amount or value of agricultural products raised in the local government's jurisdiction. Tax may vary by type of crop, and it may be based on the (a) actual amount produced, or (b) the acreage under cultivation. Tax may be collected directly from the farmer or, for crops that are sold to processing plants, from the processor. In addition, agricultural processing taxes may be imposed on commercial processing plants.

2. Beneficiary Charges - Beneficiary charges are fees that the recipients of public services pay for those services. The two major categories of beneficiary changes include:

   - User Fees: Charges imposed on usage of a service, usually based on the amount of the service consumed. User fees often include a minimum fixed access charge as well as a variable consumption charge which varies with the amount of service used. An example of an access charge is the initial connection fee for water or telephone service; an example of a consumption charge is the monthly charge for water actually used.

   - Betterment Levy: A fee imposed on a property owner whose property is benefitted by a public investment, usually the installation or upgrading of physical infrastructure (roads, water system, sewer, electricity lines.) The levy is proportional to the increased value of the property caused by the betterment; the levy may be set to recover (a) some fraction of the cost of the betterment, (b) all of the cost, or (c) an amount greater than the cost. The betterment levy may be collected in cash, at one time, or spread over a number of years; they levy may also be attached to the property tax. In a number of Asian countries, instead of a cash levy, some fraction of the bettered land may be taken

to be sold on the open market to recover the cost of the betterment; this is called land readjustment or land consolidation.

3. Licenses - licenses are fees charged to individuals or business firms to allow them to engage in certain types of activities which are regulated by the local government. A license is usually charged at a flat rate for each category of activity (i.e., it does not vary with the volume of business like the business activity tax.) A license is usually given for a year's time; when he pays the license fee, the licensee is normally given a certificate, or tag, which must be displayed.

   Licenses may be used simply to raise revenues for the local government, or they may be used to control health and nuisance hazards; in the latter case, the license is given only when certain standards are met by the licensee (for example, in restaurants.) Licenses may also be used to insure that businesses pay their other taxes by tying the granting of the license to receipt of payment for those taxes.

4. Patrimony - patrimony includes all income from assets owned by the local government:

   - Interest Income from cash invested by the local government in banks or other financial institutions

   - Net Revenues from Public Enterprises owned and/or operated by the local government; most common example includes operation of public markets

   - Rental or Sale of Government Land

5. Central Government Transfers - grants make by the central, or in some cases state, government to the local government. The two important characteristics of central government grants are (a) determining the amount of grant funds allocated to each local government and (b) the types of activities that the grant funds can be used for. The major categories of grants include:

   - Shared Taxes: Some proportion of taxes collected by the central government in the local government's jurisdiction are returned directly to the local government.

   - Formula Grants: The pool of central government funds is allocated to local governments on the basis of a formula, usually including population and some measure of need or poverty; some grant formulas are compensatory, making up for deficits in the local government budget.

- Special Purpose Grants: Certain grant funds are earmarked for special purposes only; these funds may be handled on a reimbursement basis, being given to the local government only after an approved expenditure is made.

- Ad Hoc Grants: The central government may appropriate funds on a year-to-year basis for certain classes of expenditures and/or for certain classes of local governments; these are not consistent from year to year and, therefore, cannot be depended on for continued local budget support.

6. Borrowing - Local governments may borrow funds for both capital investments and operating expenditures. Major categories of borrowing include:

   - Long-Term Debt: Debt incurred beyond the current fiscal year, usually with a repayment period of 10 to 30 years. Long-term debt may be secured by either (a) the general tax receipts of the local government or (b) the expected revenue produced by public investment such as water system (see user charges.) In the United States, local governments borrow primarily in private capital markets by issuing bonds whose interest income is exempted from taxes by the federal government. In developing countries, local governments borrow primarily from central banks.

   - Short-Term Debt: Local governments may borrow within the fiscal year to meet immediate cash needs caused by fluctuations in revenues and/or expenditures.

   - Interfund Borrowing: Local governments may engage in short-term borrowing by transferring funds from one local government account to another; for example some local governments "borrow" money from funds which run cash surpluses, such as housing authority and water system accounts, to make up deficits in the general fund. Two problems with interfund borrowing is that the borrowed money is often not repaid (depleting the funds which may be needed for expansion or replacement) and the borrowing hides the need for increasing general fund revenues.

B. Revenue Collection Concepts

1. Revenue Base - The total amount that is available to be collected from a given revenue source. Revenue bases differ depending on the type of revenue. The property tax base is the total value of taxable property in the local government's jurisdiction; for the local government to collect the property tax, the information on the tax base must be recorded on the property tax rolls, which is

a list of the taxable property and its value by individual owners.

2. Collection Efficiency - The proportion of the revenue base actually collected.

3. Collection Costs - The total cost of collecting a given revenue; collection costs include all salary costs of collection staff plus support and administration staff involved in collection.

4. Net Revenue - the amount of revenue collected less the collection costs; since total costs of revenue collection may be hidden (e.g., salaries of revenue collectors may be paid directly by the central government), many revenue sources may be producing a negative net revenue.

5. Tax Effort - A measure of the amount of total taxes raised per capita in a community divided by the wealth of the community (usually represented by per capita income). Tax effort is used to measure how much of the wealth base of a community the local government is able to acquire for public purposes.

C. Expenditure Concepts

1. Fund Accounting - Expenditures, and revenues, may be accounted for in separate accounts maintained by the local government. In general, local governments maintain a general fund which contains current operating expenditures of the local government. Individual countries may also maintain separate:

   - Capital Expenditure Funds for all capital expenditures
   - Infrastructure Funds for capital expenditures on constructing physical infrastructure projects
   - Individual Funds for Service Delivery Systems which include both current operating expenditures and capital expenditures as well as revenues from the service delivery system
   - Funds for Earmarked Grants which track expenditures of central government grants which can only be used for specified purposes.

2. Capital vs. Current Expenditure Accounting - Local governments are encouraged to separate current operating expenses from capital expenditures since capital expenditures provide a flow of benefits to the community over a period of years and their cost should be spread over the useful life of the investment. Also, since capital expenditures tend to be large, their inclusion in a

single budget with current expenditures makes it difficult to see what the pattern of current expenditures really is.

3. Direct vs. Indirect Cost Components - Expenditures for local services have direct cost and indirect cost components. Direct costs are those costs created directly by providing the individual service and which would not be incurred by the government if it did not provide that service; for example, the cost of installing water pipe is a direct cost of a water system. Indirect costs are those costs incurred generally by a local government in providing all local services and which cannot readily be divided up as being "caused" by any one service; for example, the cost of maintaining a centralized accounting office for all public services or the cost of maintaining the City Hall in which offices of the service delivery agencies are housed are considered indirect costs.

4. Operation and Maintenance Expenses - Capital investments, such as a water system, create long-term need for expenditures to operate and maintain the systems properly. Therefore, capital investments have direct impact on future operating budgets of the local government which are often not recognized when the investment is made. Often the capital expenditure is made in the form of a central government grant with no provision for additional support for the operation and maintenance needs.

5. Depreciation and Amortization Expenses - When a capital expenditure is made, its benefits occur over a period of years; another way to say this is that the value of the capital investment is used up each year of the investment's useful life. To establish the true cost of using that capital investment (for example, a water system) each year the total amount of the expenditure may be divided by the number of years of its useful life to determine the value of the investment used up each year. This is termed "depreciation" in that the use of the investment is using up, or depreciating, the value of the investment. Depreciation may also be thought of as "replacement" costs -- the cost that the local government would incur to replace the capital investment that is used up during the year.

   If a local government borrows money for a capital investment, the cost of the loan is paid back over a number of years; the payments are used to "amortize" the loan -- it is the mirror image of depreciation in that the value of the capital investment is paid back as the investment is used up.

   Since the costs of capital investments are real costs in providing services, the amount of depreciation/amortization (i.e., the amount of the capital investment used up) should be considered as direct costs in estimating the true costs of

providing public services, particularly when trying to recover acutal costs from service recipients. However, many local government fail to consider these costs when estimating the costs of providing public services.

6. Hidden Expenditures - In addition to the costs of depreciation and amortization, local governments often overlook other cost components when trying to estimate what individual public services really cost. Expenditure items which are often overlooked include:

   - personnel costs (when the salaries are paid by the central government or are lumped together in the general fund)

   - equipment costs (when the equipment has been purchased with central government funds or as part of general government expenditures)

   - land costs (when the local government already owns the land)

7. Expenditure Data - In examining expenditure data maintained by local governments, one must be careful to understand three important factors:

   - Differences Between Budgeted and Closed Accounts: Expenditure (and revenue) data may be reported as either "budgeted" amounts (i.e., estimated at the beginning of the budget year by the local government) actually spend at the end of the budget year.) Since many governments report both budgeted and closed amounts, it is important to know which sets of data one is working with when comparing data.

   - Cash Accounting vs. Accrual Accounting: Some governments record and expenditure (or a revenue) only when the money is transferred physically; this is called "cash" accounting. On the other hand, some governments record an expenditure (or revenue) when the money is committed but before it is physically transferred; this is called "accural" accounting because the obligation is accrued. The most conservative form of local government accounting is to cash account revenues while accural accounting expenditures.

   - Current vs Constant Currency Values: Future expenditures may be projected in "current" values (i.e., the money to be spent, valued at current price levels), or in "constant" values (i.e., the amount of money to be spent, adjusted for expected inflation.)

8. Non-Recorded (Off-Budget) Expenditures - Non-recorded expenditures are tax credits or exonerations that the government

gives to individuals or firms that reduces the tax they have to pay on certain specified items. They are not expenditures in the sense that the government actually spends money that it has received. They are the same as expenditures, however, in that they are revenues that the government does not collect.

D. Public Service Delivery Concepts

1. Service Delivery System Components - The components that make up a public service delivery system are as follows:

   - Service Delivery Agency: the agency that acutally produced and delivers the service to the users or consumers of the service

   - The Service: The service or good actually delivered by the agency to the service recipient

   - The Service Recipient: The user of the service and the one who received the "benefits" of the service

2. Service Delivery Responsibility - The responsibility for providing public services can be assigned to different levels of government and even to non-government organizations. The major categories of service providers include:

   - National Government Ministries and Departments

   - State or Provincial Government Agencies

   - Local Government Departments

   - National Authorities or Para-Statal Organizations (Public Enterprises)

   - Local Public Enterprises

   - Private Firms (Usually Under Contract to Local Government)

3. Level of Service - Almost all public services can be provided at different levels of quality which determine the cost of providing the service. For example, potable water can be provided at three major levels of service:

   - A central well from which residents draw water and carry to their houses.

   - A systems of standpipes connected to a treated and piped water system. The standpipes are located centrally in

residential neighborhoods; residents draw water from the standpipes and carry it to their houses.

- A piped water system with connections to each house.

4. Service Benefits - The recipients of public services receive "benefits" or value from the public service. It must be kept in mind that benefits are defined as the service actually received (e.g., water received, refuse picked up.) The value of the benefits should be proportional to the level of service provided (see above.) Furthermore, the value of benefits would be proportional to the willingness of the service recipients to pay for those services.

5. Demand for Services - The demand for services is defined narrowly as the price that service recipients are willing to pay for the service received at a given service level. Demand is different for service need which is the level of public service that citizens require to maintain a minimum acceptable standard of living; establishing what the standard should be is largely a political and social issue and may vary from community to community.

6. Equity - Equity applied to public service delivery has two major components:

   - Distribution of Service Benefits: how evenly are public services distributed among the population in accordance with service need? (see above)

   - Distribution of Costs Among Service Recipients: There are two separate issues here:

     * Are costs of the service distributed in proportion to the benefits received?

     * Are costs of the service distributed in proportion to ability to pay?

7. Public Goods vs. Private Goods - When public services provide benefits to all citizens equally, they are said to be providing a "public good" (i.e., police protection, mosquito eradication.) When public services are providing benefits to only the direct recipients of the service they are said to be providing "private goods" (water received, a ride on a public bus.) Some services provide a mix of both public and private goods; for example, vaccination provides private good to the recipient of the vaccine (he is made healthier) and a public good to the community by stopping the spread of the disease.

8. Public Service Pricing Strategies - In setting the price of public services, local service agencies may adopt different strategies:

   - Maximize Net Social Benefits: Service agencies may set prices to maximize the total of public and private goods distributed.

   - Maximize Efficient Utilization of the Service System: Prices may be set to encourage the highest use of the public services without resulting in overuse or congestion.

   - Maximize Cost Recovery: Prices may be set to recover the cost of providing the service; where the service agency is trying to recover the total costs, it may use two price setting strategies:

     * average cost pricing - service recipients are charged a price equal to the average costs of providing the service across all consumers

     * marginal cost pricing - recipients are charged a price equal to the actual costs of providing the service to them; this results in varying costs for the same service provided to different service recipients.

9. Subsidies in Service Pricing - The local government may provide a public service at a price equal to its true costs of providing the service or it may provide the service on a subsidized basis. The subsidy may be general to all service consumers or it may be provided to only certain classes of consumers. The subsidy may come from the general revenues of the local government or from the central government. Alternatively, the price structure of the service may be set to provide services below costs to one set of consumers while charging above-cost prices to another set; for example, water system rates may be set low for small residential users and high for commercial or high volume users -- this practice is called cross-subsidization. The government may also decide that all citizens are entitled to a minimum level of public services at a price everyone can afford; these minimum prices for minimum service level are often called lifeline rates and are provided at a price that is below the cost of providing the service (i.e., requires a subsidy from the government to cover the true costs.)

- **Technical Note on Linear Regression Technique**

The linear regression technique is used to fit a straight line to several data points. In this Handbook, it is used to establish the trendlines underlying observed revenue and expenditure collections over several years' period.

The underlying assumption of regression analysis is that we can predict the value of some variable Y on the basis of knowing the value of variable X. The regression technique analyzes the relationship between observed values of X and Y for a number of observations and then calculates the mathematical relationship between the two variables as:

Y = Constant + (Coefficient) times "X"

In our trendline applications, X is the year and Y is, for example, the amount of revenues collected.

Linear regession coefficients and constants may be calculated by use of a computer program, a programmable calculator, or by hand calculation. The first two methods have the regression calculations built into the computer software or the calculator with attendant instructions. However, to calculate the regression equations by hand requires special instructions provided below.

To determine a regression line by hand, you should first develop a table as below. The first column is the years over which the time series will be plotted, with the first year indicated as number "1". This first column is termed the "X" values. The second column is the recorded data for the variable you wish to develop the trendline for, such as the amount of revenues collected. This column is termed the "Y" values.

The remaining columns are derived from the first two columns:

- Column 3: Value of X minus the average of all X values
- Column 4: Value of Y minus the average of all Y values
- Column 5: Square of Column 3
- Column 6: Square of Column 4
- Column 7: Column 2 times Column 3

The regression equation is then calculated as:

Predicted Y = a + b times X

where "b" is the coefficient = sum of Column 7 divided by the sum of Column 5, and

where "a" is the constant = average of all Y's (Column 2) minus "b" times the average of all X's (Column 1)

REGRESSION CALCULATION TABLE

1	2	3	4	5	6	7
Year (X)	Revenue Amt.(Y)	X - avg.X	Y - avg.Y	(Col 3) squared	(Col 4) squared	(Col 3) times (Col 4)
1	30	-2	-5	4	25	10
2	35	-1	0	1	0	0
3	28	0	-7	0	49	0
4	37	1	2	1	4	2
5	45	2	10	4	100	20
Sum 15	175			10	178	32
Avg. 3.0	35.0					

If we now use the numbers in the Table above to calculate the regression equation, we have:

"a" = 35 - (3.2) (3) = 25.4

"b" = 32/10 = 3.2

and the values for the trendline would be:

Year 1 Y = 25.4 + (3.2) (1) = 28.6

Year 2 Y = 25.4 + (3.2) (2) = 31.8

Year 3 Y = 25.4 + (3.2) (3) = 35.0

Year 4 Y = 25.4 + (3.2) (4) = 38.2

Year 5 $Y = 25.4 + (3.2)\ (5) = 41.4$

If we plotted these values on a graph, they would produce a straight trendline, showing the underlying trend in revenues for our sample data. The reader can use ther same Table, substituting other figures in Column 2 (Y values) to calculate other trendlines.

• Note to Instructors

In addition to serving as a reference manual for local and national officials involved in municipal financial analysis, this Handbook is intended to be used for training courses on local management and finance. The purpose of this note to provide guidelines for use of the Handbook as a training instrument. We would also like to share with you some of the experience we have gained in the Urban Financial Management Training Program of the Research Triangle Institute.

This note is addressed to instructors in countries in which the Handbook will be used as a training instrument. Because of the broad range of municipal financial conditions and practices across countries, this Handbook's treatment of financial management is necessarily also broad. Your primary task as instructor within a particular country is to ensure that this Handbook's conceptual discussions and practical exercises are supplemented with the special legal, administrative and political conditions, as well as the availability and reliability of municipal financial data, in your country.

We recognize that the specific municipal finance training needs vary from country to country; indeed, these needs may differ among groups of participants within a country. Thus, this Handbook should be considered a flexible training instrument, with each instructor responsible for adapting it to the particular needs of each group of participants. It should be noted, however that the Handbook's order of presentation builds on a sequence of techniques and tools, in which new analyses incorporate techniques presented in previous sections. If this order of presentation is changed for a particular participant group, therefore, the instructor should insure that prerequisite techniques are adequately discussed before new material is presented.

This Handbook places a strong emphasis on municipal financial data, and much of the success of training programs using the Handbook depends on gathering adequate data for each participant group. General guidelines for data collection are presented in Section 2.3. In our experience, adequate data are almost always available, but its assembly in the formats required for use in conjunction with the Handbook may require a significant effort. The effort will result in a high training return, however, as it provides participants with exercises and discussions based on their real working environment.

The data requirements for this Handbook fall into two broad categories: municipal financial data aggregated at the municipal and the national levels. In both cases the analytical focus is on comparative performance: at the local level over time; and at the national level across municipalities as well as over time. We have found that two key techniques require significant data collection efforts, but training pay-offs are very high. These are the revenue potential model (see Section 3.2.3) and municipal service performance indicators (see Section 4.5). Both techniques may present a new approach to financial analysis for many participants, but we have found that once the techniques are mastered, they provide excellent bases for group discussions. They also may be included among the "routine" financial analyses conducted at the municipal and central government levels.

In RTI's training experience, this mixture of local and national perspectives of financial analysis is a very effective training strategy. It can be even more so when there is a mixture of participants from municipal and national governments. Frequently, a training program may be the only opportunity for municipal financial officers to meet with, say, staff of the central government's municipal development institution or housing ministry, in a structured environment in which individual opinions and positions do not necessarily reflect agency policy. Just having local and national staffs together with a

common, non-competitive agenda may produce significant training results in itself. These positive results are enhanced by a training format that emphasizes each participant articulating and sharing his professional experience in a structured training environment.

One of the training objectives of this Handbook is to use financial management techniques and tools as a basis for stimulating participant discussions. This is particularly effective when the in-country instructor(s) makes the pre-program effort of data collection so that each participant identifies his own municipality or agency represented in the analysis. Generally, our experience indicates that approximately equal amounts of full group and small groups' (four to eight participants with mixes of local and national officials) discussion time are appropriate. In full group discussions, the instructor generally takes the lead in introducing concepts and analytical techniques. The small group discussions are normally dedicated to applications of these concepts and techniques to country-specific data. The findings and recommendations of small groups should be presented in full group sessions, where differences of approach and findings may be analyzed. Especially when the training program has a duration of more than one week, classroom sessions may be fruitfully complemented by field visits to relevant institutions.

You may note that the Handbook generally follows a three step approach in presenting and discussing new financial management techniques. First, the underlying concepts and concerns are presented. Next, the analytical tools are described, supplemented with a case study and/or exercise. Finally, there is a discussion of the findings, leading to such questions as: What are the data telling us, and where do we go from here? This methodology may be followed in the training program. Generally, all three steps should be presented and discussed in full group sessions, using the data and examples presented in the Handbook. Then, the full group should be divided into smaller groups, each working

with the same data set for their own country or region. Small group sessions should include use of the technique under discussion, and each group should seek to reach consensus on their findings. Finally, each small group presents their analyses and findings to the full group, with the session concluded by a comparison and debate on approaches and findings.

In order for this training methodology to be effective, in which each participant should provide as well as receive useful inputs to/from training colleagues, the number of participants should be limited to a maximum of 30. A more effective adequate participant group size will have to be determined by each sponsoring institution, taking into account the costs and benefits of alternative group size.

Finally, we have found it effective to prepare orientation "packages" to be delivered to each participant about one month before training begins. This package should contain information about the content of the program, the training methodology to be used, specific data that each participant should bring to the program, maps and other information about the training site, and a request that each participant bring a hand calculator to the training site.

Training in the urban financial management area is a continuous learning experience, not only for trainees, but also for instructors and sponsoring institutions. This Handbook has been prepared with the experience of training programs with participants from fifteen countries and three continents. One of the key lessons learned from this experience is that "what works" varies from one training environment to another, and there is always room for improvement. Thus, we would very much appreciate your comments and evaluation of applications of this Handbook in your country. We would like to incorporate your experiences in future up-dates of the Handbook.