

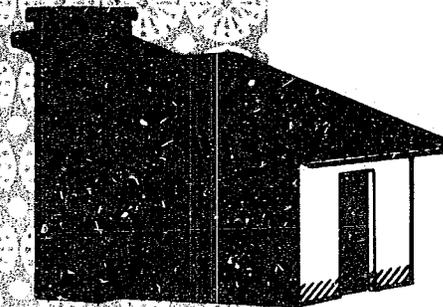
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Housing Market Analysis in Latin America

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Division of International Affairs
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HOUSING MARKET ANALYSIS IN LATIN AMERICA

A technique to estimate housing requirements in terms of the ability of families to afford shelter at various price levels.

1965

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PREFACE

The purpose of this manual is to make available to Latin American housing officials market analysis techniques for estimating the number of families able to pay for housing at various price levels. Emphasis is placed on those analytical methods most useful in estimating effective housing demand in Latin America. The manual should also be useful in estimating effective housing demand in other geographic areas. However, the techniques developed in the manual will require special adaptation to meet different cultural and economic patterns found in other parts of the world.

The author has attempted to describe market analysis techniques in nontechnical language in order to make the manual useful to persons who are not market analysis specialists. Every technique is illustrated with an example based upon actual marketing data collected during field tests of the analytical methods described in the manual. The field tests were conducted in Argentina, Honduras, and Nicaragua.

The manual was developed on behalf of the Latin America Bureau of the Agency for International Development by Richard Metcalf, Department of Housing and Urban Development, with the assistance of Bernard Horn and Richard W. Lippold, Office of Program Policy. The cover is the work of Margaret Harrington, also of DHUD.

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Note: Worksheets are printed in a separate publication.

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Chapter I

INTRODUCTION

Housing market analysis defines shelter requirements in terms of the ability and willingness of families to obtain housing at various price levels. This information is essential for the intelligent development and construction of housing and for orderly and realistic economic planning.

The housing requirements of a city must be related to the amount of money families can afford to pay for housing. This will enable an equitable distribution of scarce housing resources.

Housing market analysis measures shelter requirements in terms of "effective housing demand." This is a term commonly used by economists to denote the number of new housing units at various price levels which families falling within different income ranges are expected to occupy.

HOUSING NEED

Housing "need" differs from "effective housing demand" in that housing need is equated with new family formations and the number of families who lack housing or who live under substandard conditions or in an overcrowded dwelling. Effective housing demand, in contrast, determines the number of families in need of housing who can afford shelter at various price ranges.

The price level at which families can obtain housing will depend on local land prices, construction costs and financing terms. Where housing costs represent only a small budget outlay in relation to family income, a large proportion of families will be able to afford shelter. On the other hand, where incomes are low and housing costs are high, only a small proportion of families will be able to obtain housing. The number of families who can afford housing

can be increased by government assisted programs that result in lower housing costs.

LACK OF EFFECTIVE DEMAND ESTIMATES

The housing needs of Latin American cities have rarely been defined in terms of shelter requirements at various income or housing price levels. A major reason for the absence of effective housing demand estimates has been the lack of statistical data which are needed to develop sound market estimates. Such essential data as household income and information on the proportion of family income allocated to housing expenses are virtually unavailable. Equally difficult to obtain are employment and work force data and statistics on housing quality.¹

The great need to measure Latin American housing requirements in terms of the ability of families to afford such housing led to the development of a simplified housing market analysis technique that can be adapted to the available statistical information. The technique described in this manual outlines a process for developing housing market estimates by using public records, civil laws, administrative files, interviews and untabulated statistics which can be obtained from government and private organizations.

ORGANIZATION OF MANUAL

The manual suggests several alternative sources for obtaining information and describes techniques for developing the necessary basic data in cases where pertinent statistics are un-

¹Reliable population statistics and data on the number of persons per family are generally available in Latin America.

available. For example, in the absence of reliable population estimates this manual suggests several relatively simple methods by which local housing officials can make their own population projections.

The alternative techniques suggested in the manual for developing the necessary estimates should be used only where statistical information provided by census tabulations, sample surveys and estimates by qualified technical personnel are either unavailable or are unreliable. Housing market analyses which are based on reliable primary data will usually yield more precise estimates of effective demand than those which depend upon secondary sources. However, if circumstances require the use of secondary sources of information, sufficiently sound estimates of effective demand for housing can still be obtained.

No single statistic will measure the effective demand for housing. The process by which housing demand is measured may be compared to putting a jigsaw puzzle together—no piece, by itself, portrays the picture; but when all the pieces are fitted together, a picture is obtained. Similarly, the market researcher must piece together various factors to arrive at a clear picture of effective housing demand.

This manual is designed to guide housing officials through the several steps involved in estimating effective housing demand. It identifies data requirements, the estimates and projections to be made, and the final computation which must be carried out. Housing officials should follow each of the instructions carefully. Omission of any single step in the market analysis procedure can nullify the final results.

Each of the steps for arriving at an effective housing demand estimate is described separately. Also pertinent sections from actual

market studies are included in the text as examples. Worksheets have been developed for each phase of the study to simplify the analysis. The final result obtained from each worksheet produces the basis for proceeding to the next worksheet. For instance, the population estimate worksheet forms the basis upon which the number of households are estimated.

The statistical procedures developed in this manual do not require any original data collection by the analyst. Instead, emphasis throughout the manual is placed on the use and adaptation of already available information.

The technique described in this manual is limited to estimating the effective demand for private houses offered for sale (including condominium housing). Omitted from consideration is the market for rental housing and the market served by housing which involves various kinds of government subsidy.

The subsidized housing market presents special problems of governmental policy which fall outside the scope of this housing market analysis, although the basic procedure of this technique could be employed to measure this market as well.

Since no two communities are alike, no rigid rules can be established for obtaining economic information. Local characteristics and considerations will control the kind of economic data which the market researcher will need to estimate effective housing demand. Therefore, in developing this manual, emphasis has been placed upon providing general guidance and furnishing suggestions on how to obtain the required information.

A basic premise of this manual is that the market researcher must be resourceful in collecting the data he requires.

Chapter 2

THE HOUSING MARKET AREA

An initial task in carrying out a housing market analysis is to delineate the geographic area of the market to be studied.

DEFINITION

A housing market is defined as the area within which the population normally lives and works. This would usually consist of the central city which contains the principal population and employment concentrations and the adjacent suburban areas.

DELINEATION OF HOUSING MARKET

The housing market should be delineated so that its boundaries will conform to the boundaries of its minor civil divisions. This is important because almost all of the statistical data used for market analysis are published on the basis of these political jurisdictions.

For example, in a market analysis of Mendoza, Argentina, the housing area was defined to include the provincial capital—Mendoza—and the adjoining localities of Guaymallen to the east, Godoy Cruz to the south and part of Las Heras

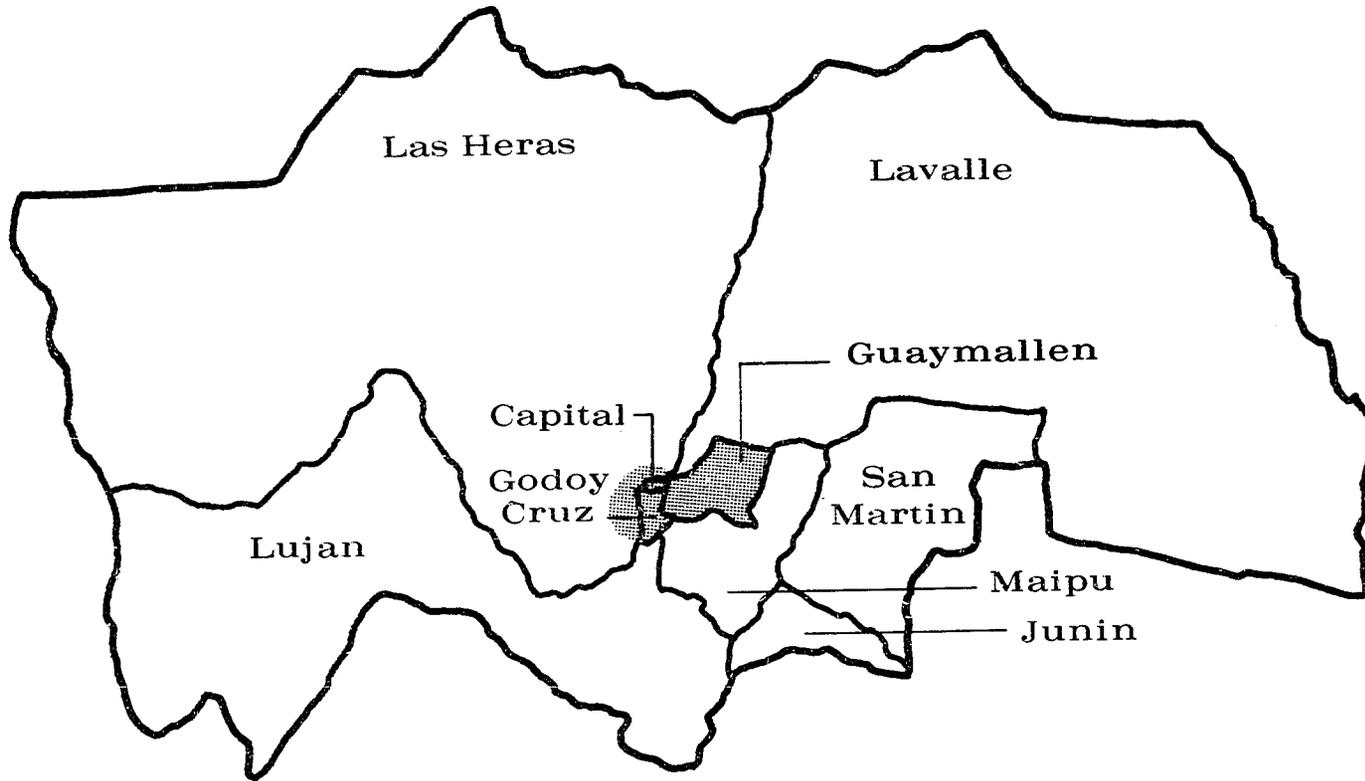
to the north. It will be noted (see map) that Las Heras includes territory which is substantially larger than the rest of the commuting range of workers in Mendoza.

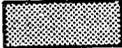
The reason for including part of Las Heras in the housing market analysis is that the portion of Las Heras adjoining Mendoza is densely settled and plays an important role in the economy of Mendoza. The area of Las Heras not adjoining Mendoza is very thinly populated. It is estimated that approximately 98 percent of the population of Las Heras reside in the densely populated areas which immediately adjoin the central city.

If the remainder of Las Heras had also been densely settled but not economically tied to Mendoza, then the market researcher would have to allocate an appropriate share of Las Heras to the Mendoza market.

Sample worksheet 1 provides an aid for delineating the housing market areas. It shows how the analyst can pro-rate the resources of a political subdivision, only part of which falls within the housing market areas. The Mendoza housing market is used for illustrative purposes.

Mendoza and Surrounding Minor Civil Divisions



 Mendoza Housing Marketing Area

Chapter 3

ECONOMIC BASE STUDIES

Economic base analysis evaluates and describes the general economic conditions of the area. This economic analysis is fundamental to the researcher's recommendations. If the market study indicates a market for private sales housing, the analysis should also show that the area is economically sound for housing investment.

In addition, the economic base study serves as a guide for projecting household formations.

A sound and expanding economy and high level of employment opportunities will attract workers, who will either bring their families with them or will form new households. These immigrants, in turn, enlarge the population base for future natural increases.

ECONOMIC DETERMINANTS

The economy of any area is usually dependent on one or several basic types of activity. This may be one large employer, such as a steel mill or it can be many small independent establishments such as artisans. The fortunes of the community rise and fall with the level of economic activity of the basic industries.

The basic industries in turn provide a livelihood for many secondary industries, such as tailoring shops and restaurants whose existence depend on the continued economic well being of the basic industries. While gains and setbacks in the economy are shared equally by the basic and the secondary industries, it is the basic industry that is the major determinant of the economic development of the community.

IDENTIFYING BASIC INDUSTRIES

Because of the close relationship between effective demand for housing, economic soundness and population trends, it is important for the market researcher to appraise fully the economic components of the area and to identify the basic industries.

Since the basic industries are usually the largest local producers and employers, the market analyst will generally have little trouble identifying these industries from local production, labor force or employment statistics. However, there will be instances where statistical data of the type required may not be available, particularly for small and medium size cities. In these instances the market researcher must rely upon businessmen and public officials for information concerning the local economy. These persons will usually be knowledgeable regarding general economic developments in the community and will be able to direct the researcher to the principal employers in the area.

It is important that the researcher evaluate the economic prospects of the basic industries, with particular emphasis upon their potential for future production and employment. This is important because expansion in the basic industries will attract immigrants if local labor force reserves are insufficient. This, in turn, will lead to further expansion of the secondary industries.

On the other hand, decreases in basic employment will have a negative effect on population trends. Immigration will virtually cease, and outmigration of unemployed workers will start.

Ordinarily there is a substantial delay between job losses and outmigration. Sooner or later, however, outmigration will take place, provided job opportunities develop elsewhere.

The main purpose for obtaining industry production or employment data is to recognize and assess short-term economic trends within the industry. These, as indicated above, bear directly upon the economic soundness of the area, on household formations and on demand for housing.

PRODUCTION EMPLOYMENT METHOD

Wherever possible, production or employment data should be obtained for the immediate past five years. If reliable data can be obtained going back as far as ten years, so much the better. Rarely, however, will statistical information more than ten years old shed any light on current economic conditions in Latin America.

Where production data are obtained, it is important that the data be in comparable units. Statistics reflecting the cash value of production are of value only if they are presented in a stable monetary unit. Production statistics in physical units, for example, metric tons or barrels, are preferable.

In analyzing past production or employment statistics the market researcher should only look for major gains or losses that may be expected to continue. Minor fluctuations may be caused by climatic conditions in the case of agriculture based industries or by such occurrences as strikes and shortages of raw material in extractive and manufacturing industries. These should be recognized and appropriately discounted.

ILLUSTRATION

An example of the use of long term production statistics and background data is provided by the analysis of the Mendoza, Argentina housing market. Discussions with businessmen and officials identified the basic industries in the area. Historical production figures for the past ten years were obtained from the provincial

government in order to determine statistically the rate of growth of the various major components of the economic base.¹

The following text and statistics are quoted from the Mendoza study for illustrative purposes:

“During the past decade the wine industry of Mendoza Province, which is the mainstay of the economic base, has experienced a fairly constant expansion. Between 1953 and 1962, the land devoted to grapes was expanded from 142,150 hectares to 180,930 hectares. This represents a gain of 27.1 percent.

“Because of the climatic conditions affecting the grape harvest, the gains in grape production in the past have not been as steady as the rate at which additional land was put to vineyards. Between 1953 and 1963, however, there appears to have been a general increase in grape production of nearly 50 percent. Actually the overall gain was probably somewhat less. The apparent higher rate of growth is due partly to the unusually good grape harvest in 1963.

“The gain in wine production has been equally dependent on climatic conditions. The expansion in wine production between 1953 and 1963 reflects an average annual increment of about four percent. This does not reflect several years in which the wine industry experienced sharp reversals due to climatic factors.

“The following table provides a detailed tabulation of wine production for the years 1953 through 1963 in Mendoza province.

¹Production data were obtained in lieu of employment statistics as a matter of convenience. In this example, employment data would have served equally well. However, under a changing technology, employment and production data are not interchangeable.

Wine Production—Mendoza Province 1953-1963

<u>Year</u>	<u>Land Area¹ Cultivated</u>	<u>Grape² Production</u>	<u>Wine³ Production</u>
1953	142,254	12,166.8	9,343.1
1954	147,905	8,899.7	6,894.6
1955	151,464	16,092.0	12,591.9
1956	154,970	12,864.5	9,979.8
1957	158,476	5,578.4	4,279.9
1958	160,945	10,782.9	8,584.0
1959	164,045	15,172.8	12,088.8
1960	168,349	13,631.3	10,703.9
1961	173,703	13,676.6	10,625.5
1962	180,929	15,945.3	12,787.6
1963	NA ⁴	18,106.7	14,321.6

Source: Anuario-Instituto de Investigaciones Economicas y Technologicas-Gobierno de Mendoza, 1962-1963.

Crude Oil

“Second in importance to the agriculture based industries, which dominate the local economy, is crude oil. Between 1953 and 1962 crude oil production more than tripled. It is noteworthy that in 1953 Mendoza province produced 9.7 percent of Argentina’s oil as compared to 16.6 percent in 1962. The following table shows oil production in Mendoza province and the percentage of oil produced in Mendoza as a percent of the national oil production and imports.”

*Crude Oil Production in Mendoza Province
1953-1962*

<u>Year</u>	<u>Crude Oil⁵ Production</u>	<u>Oil Production as % of National Production and Imports</u>
1953	857.2	9.7
1954	941.5	10.4
1955	1,023.1	11.0
1956	1,071.7	10.5
1957	1,437.8	11.3
1958	1,337.5	9.8
1959	1,770.4	13.0
1960	2,444.1	17.3
1961	2,260.9	14.6
1962	2,812.0	16.6
1963	NA ⁴	NA

Source: Anuario-Instituto de Investigaciones Economicas y Technologicas-Gobierno de Mendoza, 1962-1963.

The preceding statistics allow a projection of the future economic trends and employment opportunities in Mendoza. The following discussion, based on the foregoing data, illustrates the type of economic projection required in housing market analysis.

“In the past, the local economy has shown a moderate but fairly continuous expansion. There is every indication that the economy of the Mendoza area will continue to expand at a moderate rate and provide a sound basis for housing investment.

“The past rate of growth in the wine producing segment of the economy will continue into the near future. Temporary setbacks, however, must be expected because of the industry’s heavy dependence on uncontrollable climatic factors.

“Crude oil production will also continue to expand as new wells are brought in. However, unless new oil fields are located, the rate of expansion of crude oil production in Mendoza Province will slow down.

“Other segments of the local economy such as commerce and trade, government, and transportation, may be expected to gain with the growth and expansion of the two primary industries.

“The Mendoza economy rest partly on labor intensive industries and any expansion in these industries would result in proportionate employment gains.⁶ Thus, job opportunities should open up at approximately the same rate at which the economy progresses. This rate of expansion is estimated at between three percent and four percent per annum based on past experience.”

1 Hectares

2 In 1000’s of quintals

3 In 1000’s kilo liters

4 Not available

5 1000 of cubic meters

6 Labor intensive industries have a high rate of workers to plant investment. Typical labor intensive industries are agriculture, government, and manufacture; the opposite of labor intensive industries are industries which have a low ratio of workers per plant investment. Typical capital intensive industries are hydroelectric plants and airlines.

In the example cited the market researcher reached his conclusion regarding the future of the Mendoza economy by analyzing the major components of the economic base. Both the wine industry and crude oil production have experienced a continuing expansion. Wine production increased by more than 50 percent and crude oil production more than tripled between 1953 and 1963.

The production/employment analysis method described above provides one of the quickest, simplest and most reliable means available for short-term forecasting of economic trends. There are, however, other techniques available to the market researcher for projecting employment opportunities which under certain circumstances provide equally good or even better results.

GROSS NATIONAL PRODUCT DATA

Where most of the productive facilities are located in the principal commercial and industrial cities of a nation, Gross National Product (GNP) data are valuable in determining economic trends since the national data will largely reflect the economic changes in these major centers. The Gross National Product data, in these instances, can be used to supplement local production and employment data. The statistical manipulation of the GNP data are identical to the use of the production and employment statistics.

LOCAL GROSS PRODUCT DATA

A measure of the relative rate of economic growth of the housing market may be made by

comparing the rate of local gross product growth and the rate of increase in the Gross National Product.

Local gross product, however, are rarely available or sufficiently precise to assure sound and reliable measures. Where reliable local gross product statistics are available they provide a valuable statistical measure of economic growth. The market researcher can use them in the same manner as he would local production or employment data.

CONCLUSION

Generally speaking, economic trends can be forecast with greater reliability where the rate of past economic changes has been relatively steady in contrast to an economy which has experienced severe fluctuations.

Sample worksheet 2 provides an abbreviated outline for evaluating basic economic trends. In evaluating the local economy, the market researcher should look for signs of economic growth, either in terms of expanding employment or production. Steady and long term growth rates are usually indicative of a relatively sound economy and favorable conditions for investment in housing. It should be born in mind that a principal concern of the market researcher is to assure himself of the economic soundness of the housing market.

Worksheet No. 2

ECONOMIC BASE ANALYSIS

AREA Mendoza	COUNTRY Argentina	YEAR 1958 - 1963
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CHANGES IN EMPLOYMENT OR PRODUCTION

MAJOR SOURCES OF EMPLOYMENT OR PRODUCTION (List industry or company. Identify unit of measure) (1)	YEAR		CHANGE (Column 3 minus column 2)		ESTIMATED AVERAGE ANNUAL RATE OF CHANGE (6)	PROJECTED ANNUAL RATE OF CHANGE (7)
	<u>1959</u> (2)	<u>1963</u> (3)	NUMBER (4)	PERCENT (5)		
Wine Production in 1000's KL	12,089	14,322	2,233	+18.5	+4.6%	+4% to 5%
Crude Oil in 1000 M ³	857	2,812*	1,955	+69	+7.9%	+5%
Other	NA	NA	NA	NA	+3-4%	+3% to 4%

CHANGES IN GROSS NATIONAL PRODUCT

INDEX (1)	YEAR		CHANGE		ESTIMATED AVERAGE ANNUAL RATE OF CHANGE (6)	PROJECTED ANNUAL RATE OF CHANGE (7)
	<u>1958</u> (2)	<u>1961</u> (3)	NUMBER (4)	PERCENT (5)		
Gross National Product †	975,575	1,043,596	67,994	7.0%	+2.3%	+4 to 5%

NOTE: Instructions for completing worksheet 2 are provided in chapter 3 of the Housing Market Analysis Manual.

* Annual Production

† In millions of Pesos

**INSTRUCTIONS FOR COMPLETING
WORKSHEET NO. 2
ECONOMIC BASE ANALYSIS**

Changes in Employment or Production

Column 1 – Identify principal components of the economic base. Indicate statistical units by which economic trends are measured in terms of number of employees or production; for example: kilograms or cubic meters.

Columns 2 & 3 – Economic trends should be measured for a span of 5 or 10 years preceding the current period. In the heading of columns 2 and 3 the analyst should indicate the period covered by the employment or production data. In selecting the period he will be guided, in part, by the availability of statistical information. The market researcher should also be careful to select years which are representative of the long term trends. For instance, years in which employment or production were unusually low due to temporary setbacks such as draughts, floods, earthquakes, fire or strikes by labor should be avoided

Column 4 – This figure is arrived at by subtracting column 2 from column 3.

Column 5 – The figure in column 4 is expressed as a percentage by dividing column 4 by the figure in column 2.

Column 6 – This figure is computed by dividing the percentage value column 5 by the number of years covered by the employment or

production statistics to determine the average annual rate of change.

Column 7 – The market researcher should obtain reliable estimates from well informed sources on the rate of future employment or production trends.

Changes in Gross National Product

Column 1 – Identify index series and specify unit of measure.

Columns 2 & 3 – Indicate beginning and end of period covered by statistical series. (See column 2 and column 3 above)

Column 4 – Compute change by subtracting column 2 from column 3.

Column 5 – Compute percent change by dividing column 4 by column 2.

Column 6 – Obtain annual rate of change by dividing column 5 by the number of years covered by the index.

Column 7 – Enter the best available annual estimates of projected Gross National Product data.

Note: In using Gross National or local product statistics the analyst should be careful to evaluate the data for reliability and accuracy. Gross National or local product data that appear to be distorted or unreliable should not be used.

Chapter 4

POPULATION DATA

Population statistics are one of the essential elements of housing market analysis. They provide the cornerstone upon which household formations are estimated.

A city which is losing population will generate a housing demand which is quite different from that of a city which is experiencing rapid growth. In either case, the estimate of the effective demand for housing will relate directly to the number of households in the area.

Population data are also needed in order to estimate the proper distribution of housing by unit size, i.e., by number of bedrooms in each house. Other uses for population statistics are in planning housing for special markets, such as the elderly, and in determining optimum locations for new housing developments.

Because of the importance of population statistics in housing market analysis, it is essential that the data are current and reliable as possible.

Most countries in Latin America provide good population statistics for cities and for other minor civil divisions. In many countries periodic census counts have been collected over long periods of time and allow reliable long term population analysis.

POPULATION PROJECTIONS

The continuing need for population and household forecasts has encouraged many urban areas to develop population projections. Some of these estimates are of excellent quality, whereas others are of poor quality and questionable reliability. Before using the existing population or household projections the market researcher should satisfy himself that the estimates are current, reliable, and cover the entire housing market area. He should also assure himself that the population projections

take into account expected changes in the economic base in terms of increases or decreases in employment opportunities, and that immigration was accorded its proper share in forecasts of future population and household growth. Where the local housing market area does not coincide with the boundaries of the minor civil division or the geographic areas for which population data are available, the analyst must adjust the statistics to reflect the reduced area. For example, if only 40 percent of the population in a minor civil division with a total population of 80,000 live and work within the housing market area under study then only 32,000 persons of the minor civil division should be included in the total population count of the housing market. The percent of families from each minor civil division which are to be included in the housing market are determined in accordance with worksheet 1.

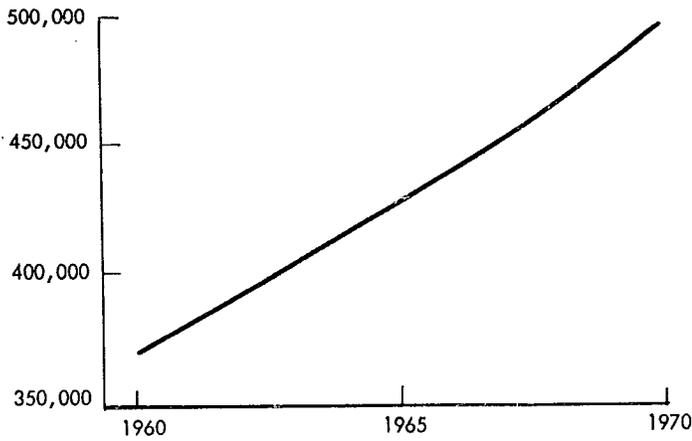
Worksheet 3 is designed to assist the analyst in estimating the population of the housing market where available population data cover an area larger than the one under study.

Only if the market researcher is satisfied that the local population and household projections are sound and reliable should he use them in his estimates of effective demand.

HOW TO USE POPULATION PROJECTIONS

Population and household projections are usually based on five year or ten year forecasts. Unless the projections have already been plotted and depicted in graphic fashion, the market researcher will have to plot the data on a curve and read from the graph the estimated population and households for the current year, the end of the housing market analysis projection period, and, if necessary, for the intervening years. (Usually three years.)

Graph 1 provides an example of how to plot a population projection.



Graph 1

Population Projection—Gran Mendoza Area, Argentina

INSTRUCTIONS FOR ESTIMATING POPULATION FOR SPECIFIC YEARS NOT COVERED BY ESTIMATES

The scale along the vertical axis is marked to show the number of persons. The horizontal scale is divided into a number of equal intervals showing the years covered by the estimates. The population for each of the years for which there is an estimate is plotted and the points are connected by a line.

<i>Years for Which Population was Projected</i>	<i>Population</i>
1960	368,000
1965	423,000
1970	488,000

The population for the intervening years may then be read from the graph.

<i>Years for Which Population had to be Read from Graph</i>	<i>Population</i>
1964	412,000
1966	436,000
1967	448,000

WHEN POPULATION ESTIMATES ARE UNAVAILABLE

In areas for which no complete and reliable population projections exist, the market

researcher will have to make his own forecast. Starting on page 16 several techniques for making population estimates are discussed.

NUMBER OF HOUSEHOLDS

In areas for which only population projections are available, the market researcher will have to read the population estimates from the aforementioned curve and obtain the estimated number of households by dividing the estimated population by the estimated size of households.

$$\frac{\text{Estimated Population}}{\text{Estimated Size of Household}} = \text{Number of Households}$$

HOUSEHOLD SIZE

The estimated size of household will usually be obtainable from the same sources that supplied the population estimates. If household size estimates are not available, the market researcher may calculate the same from the most recent population census by dividing the total population living in residential units by the number of *occupied* residential dwelling units. (Note: A structure may contain several dwelling units.)

$$\frac{\text{Population*}}{\text{Occupied Dwelling Units†}} = \text{Average Size of Household}$$

Because changes in household size occur at a relatively slow rate, the market researcher usually may use the most recent census data, even though it is several years old, to compute the average size of household.

Worksheet 4 outlines the steps to be followed in converting population projections into estimates of household formations. New household formations, as indicated previously, are one of the main components of effective demand for housing.

* Exclude population in institutions, i.e., hospitals and prisons.

† Include only residential dwelling units.

Worksheet No. 4

ESTIMATED HOUSEHOLD FORMATIONS

AREA		COUNTRY		PERIOD
Mendoza		Argentina		1964 - 1967
LINE NO.	YEAR (1)	POPULATION (2)	ESTIMATED SIZE OF HOUSEHOLD (3)	ESTIMATED NUMBER OF HOUSEHOLD* (4)
1	End of forecast period <u>1967</u>	448,000	4.5	99,500
2	Beginning of forecast period <u>1964</u>	413,000	4.5	92,000
3	Estimated new household formation during forecast period: Column 4, subtract line 2 from line 1.			7,500 †

* Column 2 divided by column 3.

† Enter in worksheet 10, line 9.

INSTRUCTIONS FOR COMPLETING WORKSHEET NO. 4

Line 1 column 2: Enter the estimated population for the end of the forecast period based on available data, or estimated population as derived from worksheet 3.

Line 1 column 3: Enter estimated size of household.

Line 1 column 4: Compute estimated number of households by dividing column 2 by column 3.

Line 2 column 2: Enter estimated population for beginning of forecast period.

Line 2 column 3: Enter estimated household size.

Line 2 column 4: Compute estimated number of households by dividing column 2 by column 3.

Line 3 column 4: Subtract line 2 from line 1.

HOW TO FORECAST POPULATION TRENDS FOR AN AREA

The following discussion outlines several techniques by which population forecasts can be made where such projections are either unavailable or appear to be unreliable.

In housing market analyses the researcher is not ordinarily called upon to make projections for more than two or three years in advance. While this short-range projection materially simplifies his task, it does not diminish the need for careful evaluation of data.

In making his prediction the market researcher should remember that his projection is based on certain predictable circumstances. Such intervening forces of an unpredictable nature as the construction of a new factory, the introduction of a new product, or the expansion of a transportation facility may cause his forecast to lose its validity.

LAG IN POPULATION CHANGES

Even a short term population projection involves considerable exercise of judgement and evaluation of data. Yet, the researcher can proceed on the basis of certain fundamental assumptions. Most important of these is the assumption that trends in the local economy are not quickly changed under ordinary circumstances. This is also true of population trends which tend to correlate highly with employment trends.

In developing a population forecast for the next two to three years, the market researcher may start with the assumption that the rate of growth will continue at approximately the same rate as in the immediate past.

The market researcher could, therefore, use as the basis for his short-term forecast a projection of the population trends of the past.

STRAIGHT LINE METHOD

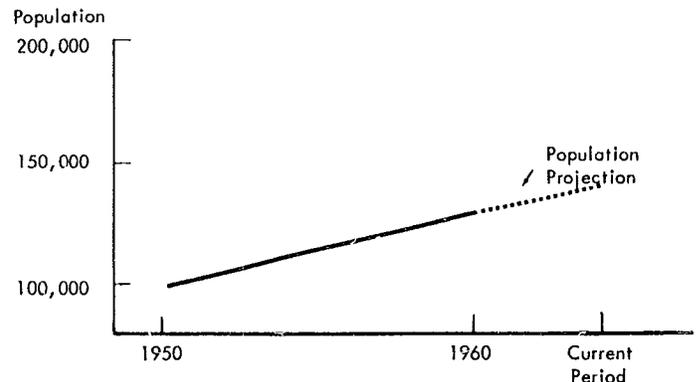
The simplest technique for making a population forecast consists of the straight line projection. This method, however, is most useful where population growth has been steady and free from sudden shifts caused by unusual in or out migration.¹

In a straight line projection the past population counts are plotted on arithmetically ruled paper and a line is drawn to connect the points. The manner in which a graph is plotted is simple. The scale along the vertical axis is marked off to show the number of persons. The horizontal scale is divided into a number of equal intervals showing the years covered by the data and the years for which the data are to be projected.

Usually it is necessary to plot only the population for the recent past to obtain a fairly reliable indication of population growth trends. Rarely will there be need to consider population data more than 15 years previous.

Population changes show an erratic pattern on a year to year basis. Therefore, the line joining the points in the population curve (if there are more than two plotted points) may form a very irregular line. These irregularities may be considered as accidental and of little significance. In order to obtain a generalized trend which may be projected into the near future, the curve should be "smoothed out." This can be done by drawing free-hand or with a "french" curve a smooth line which comes as close as possible to passing through the plotted points.

The direction of this line is then extended beyond the last plotted point to project future population estimates.



Graph 2

Estimate of Current Population by Means of Straight Line Projection

¹ The straight line method of population projection is emphasized in this manual because it is the simplest means by which housing officials, who are not trained demographers, may develop reasonably sound population estimates. Most other population projection methods require knowledge of advanced statistical techniques.

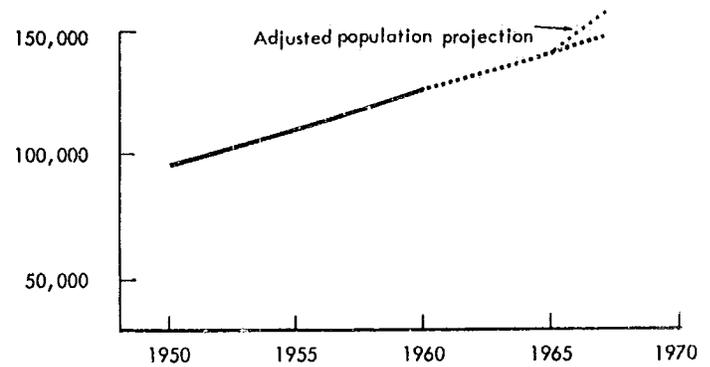
The straight line population projection should only be used where local population estimates and forecasts are unavailable. This method of population forecasting will yield satisfactory estimates only where recent population counts can be obtained and where the local economy has not experienced any major changes. As the base population data become older or changes in the local economy occur, straight line projections become less reliable.

Where the local economy has experienced a significant shift after the last census was taken or where a major change is expected to take place during the forecast period, the researcher will have to exercise judgment in adjusting the straight line population projection to reflect these changing circumstances. There are no firm and explicit techniques for adjusting these conditions. However, the following general guidelines should be observed when changing local economic circumstances suggest that the analyst modify the results obtained from a straight line projection.

SUDDEN POPULATION SHIFTS

Population changes generally tend to lag behind economic developments. It takes time, for instance, for immigration to build up in response to improved economic or social conditions. The market researcher should be careful not to over-adjust a straight line projection. Only under the most unusual circumstances will the rate of population growth in Latin America increase by more than five percentage points in any one year *over the existing rate of increase*. Generally the rate of population growth in response to any major improvement in economic condition will not exceed two percentage points per year above the straight line projections, i.e., the annual rate of population growth may increase from 3.5 percent to 5.5 percent as a result of economic stimulus.

Population shifts in response to economic setbacks occur even more slowly than do population gains because of the general reluctance of families to move once they have become established. The population tends to remain in a locality and will experience increased unemployment long after the decline in economic activity has manifested itself. The analyst should,



Graph 3

Adjustment in a Straight Line Population Projection to Reflect Change in the Rate of Population Growth

therefore, be careful not to over-adjust a straight line projection to reflect population losses. Rarely will an economic decline result in a decrease of more than two percentage points per year in the existing population trend.

Graph 3 provides an illustration of how a straight line population projection can be adjusted to reflect projected changes in the rate of population growth.

INSTRUCTION FOR ADJUSTING STRAIGHT LINE PROJECTION

Step 1 – Plot past population counts. In above example population census for 1950 (population 97,000) and 1960 (population 126,000) were available.

Step 2 – A straight line was drawn through the plotted points and continued to the end of the forecast period – 1967. (The year in which the population projection is started is 1964).

Step 3 – For the purpose of this illustration it is assumed that in 1965, one year after the date of the population projection is made (1964), the area experiences a moderate increase in the rate of economic growth. This gain in economic growth, it is estimated, will result in an increase in the annual rate of population growth from 3 percent to 5 percent. To adjust the straight line projection to reflect this change, the population at the end of 1965, as read from the straight line projection, is increased to reflect the increase in the rate of population growth to 5 percent. This increase is arithmetically computed.

Estimated population beginning of 1965	140,000
Estimated annual population expansion	5 percent
Estimated population end of 1965	147,000

The revised population estimate is then plotted and a new straight line projection is drawn through the newly plotted point to obtain an adjusted population projection.

HOW TO ESTIMATE THE CURRENT POPULATION OF AN AREA

As indicated previously, current population data of good quality are available for most Latin American cities. In the few localities where a major shift in the local economy has occurred since the last population census and where current local population data reflecting such changes are unavailable the market researcher should develop his own population estimates. These are needed in order to adjust the straight line population projections to reflect changes in the local economy. There are several sources of information available to the analyst in developing his population estimates.

SCHOOL ENROLLMENT

Where school enrollment data are available relatively accurate population estimates can generally be developed.

Population estimates based on school enrollment are most reliable where there is compulsory school education. School enrollment, however, may reflect national programs for improving literacy. In these cases, the population estimates derived from school attendance records must be adjusted to reflect the influences of the national program.

In order to estimate the current population from school enrollment data, several statistics are needed. School enrollment data should cover the last year for which official population data are available. If there was a census in 1960, the 1960 school enrollment data should be obtained. Also, school enrollment figures

should be obtained for the three to five years preceeding the date for which the current estimate is made. With these figures the market researcher can estimate the population for each of several years preceeding the current period.

The rate of change in school enrollment between the last year for which the most recent population count is available, year N, and the current year for which the population estimates are to be made, year C, is applied to the last year for which population count is available to obtain the estimated population for the current year, year C.

$$\frac{\text{School enrollment Year C}}{\text{School enrollment Year N}} \times \text{Population in Year N} = \text{Population in Current Year}$$

School enrollment figures are usually obtained from the municipal offices of each of the political divisions in the housing market. Where a substantial number of students attend private or parochial schools, enrollment figures will have to be obtained from each of the individual schools. School enrollment data covering only the elementary grades are needed.

The school enrollment method of estimating population changes provides reasonably satisfactory results where there is a constant ratio between students and the population in general. As mentioned above, this method must be used with particular caution, however, in those areas where governmental programs encourage increased rates of school attendance from families in the housing market area. Careful consultation with local school authorities will be needed to assess the impact of national educational programs on school enrollment.

For instance, if school attendance appears to have increased by an annual rate of 4 percent but part of this increase, 1 percent for example, is due to a gain in the proportion of children attending school, then the net school attendance gain would amount to only 3 percent. It is this latter rate of 3 percent which, in turn, would be equated with the annual rate of population growth.

In addition to the two aforementioned techniques for developing population estimates,

there are several other methods which provide good results. All of these techniques, however, require a considerable amount of detailed statistical data which are difficult to obtain. For this reason, no attempt is made in this handbook to detail the statistical procedures involved other than to make a brief reference to two of the most frequently used techniques.

HOUSING UNIT METHOD

Among the several techniques which can be used to make a population estimate, the housing unit method is one of the best. The accuracy of this method, however, depends upon an exact count of the number of housing units in the area under study and reliable data regarding the average population per household. While these statistics frequently are available for the base year from the national census, they usually are difficult to obtain for the current year for which the projection is being made.

Essentially, the housing unit method consists of multiplying the current estimated number of occupied housing units by the current estimated "average" number of persons per housing unit. To this amount is added the estimated population not living in housing units, such as families without housing, and persons in asylums, work camps, and institutions.

VITAL STATISTICS METHOD

Another method for estimating the current population involves adding to the most recent population count the number of births and subtracting the number of deaths. The population count arrived at by these means is then adjusted for migratory changes. The principal difficulties with this technique are obtaining accurate vital statistics and a sound estimate of migratory changes.

Chapter 5

FAMILY INCOME ESTIMATES

The rate of family formation, the number of households living under substandard conditions, and housing replacement requirements tell only how many families need housing units. Measures of effective demand, on the other hand, relate this need for shelter to the prospective consumers' ability to pay for such housing. An essential part of housing market analysis, therefore, is the identification of those who need housing in terms of their income and capability to afford shelter.

PERCENT OF INCOME FAMILIES ALLOCATE TO HOUSING

In Latin America the proportion of income spent for housing tends to range between 15 percent and 35 percent.¹ Accordingly, if the analyst can develop a distribution of family incomes in a community, he can also estimate the effective demand for housing in terms of families able to afford housing at various price levels. Without income data no estimates of effective demand can be derived; income statistics are an absolutely essential component of housing market analysis.

INCOME DATA

In many urban areas where no reliable income statistics are available, the market researcher will have to develop his own income estimates. These will have to be obtained from secondary sources of information, such as social security records, employers' payrolls, union

¹ The proportion of income spent for housing costs tends to decline with increasing income and increases with declining income. Housing costs include interest and amortization payments, property taxes, utilities, and maintenance.

files and interviews with government officials. The procedure to be followed in estimating incomes where there are no reliable statistics on family income is outlined starting on page 23.

Where the market researcher finds local income data, he should make sure that they are, in fact, representative of the entire community and reflect total family income. Sample data will be satisfactory, provided the sample was scientifically selected. Sample surveys of a limited segment of a community such as squatters or renters will not provide representative information and therefore should not be used for market analysis purposes.

Since the income data serve as principal measures of effective demand, the market researcher must assure himself of the reliability of the statistics. Only after the soundness of the data has been fully established may they be used for the market analysis. The fact that income data are not current should not detract from their usefulness. Fairly recent data can be adjusted to reflect changes that may have occurred since the income statistics were compiled. These changes might be of inflationary nature or can reflect real improvements in standards of living.

A procedure for making current income estimates from data that may be several years old is shown below and in worksheet 5.

INSTRUCTIONS FOR COMPLETING WORKSHEET NO 5 ESTIMATING CURRENT FAMILY INCOME

Columns 1 and 4 – Most income tabulations will be expressed in terms of the number of families by specific income ranges. As a first step, the market researcher should enter in

column 1 the income ranges as provided in the available income data, and in column 4 the number of families in each income range.

Column 2 – Income data frequently need to be adjusted to reflect changes in the cost of living. In the following example 1959 incomes were adjusted to reflect 1963 prices.

There are several different techniques which may be used to adjust income statistics. The easiest techniques – because of the general availability of consumer price indices throughout Latin America—is to relate changes in the cost of living to increases in the Consumer Price Index (CPI).

Changes in the cost of living are related to many economic factors. However, the CPI has proven to be a highly sensitive index, and experience shows that incomes tend to lead or to follow closely changes in the Consumer Price Index.

In the example shown on worksheet 5, the CPI for 1959 stood at 144.9. By June 1963 the CPI has advanced to 157.5, a gain of 8.7 percent. In order to bring the 1959 income data up to the June 1963 price levels, the 1959 income ranges are multiplied by a factor of 1.087.

In adjusting the income ranges in column 1, both the top and the bottom of each income range are multiplied by the adjustment factor in column 2. The adjusted income ranges are entered in column 3.

In most Latin American Countries CPI data will be available only for the country as a whole, rather than the city in which the study is being carried out. While this may introduce a minor distortion in the income adjustments for individual localities, the error is relatively small and will not affect the general validity of the estimates.

Column 5 – This is a simple percentage distribution computed from column 4. The number of families in each income range is divided by the total number of families.

Column 6 – The cumulative percentage distribution is the summation of the percentages in

column 5. For example, 19.2 percent of the families had incomes below \$4,347.

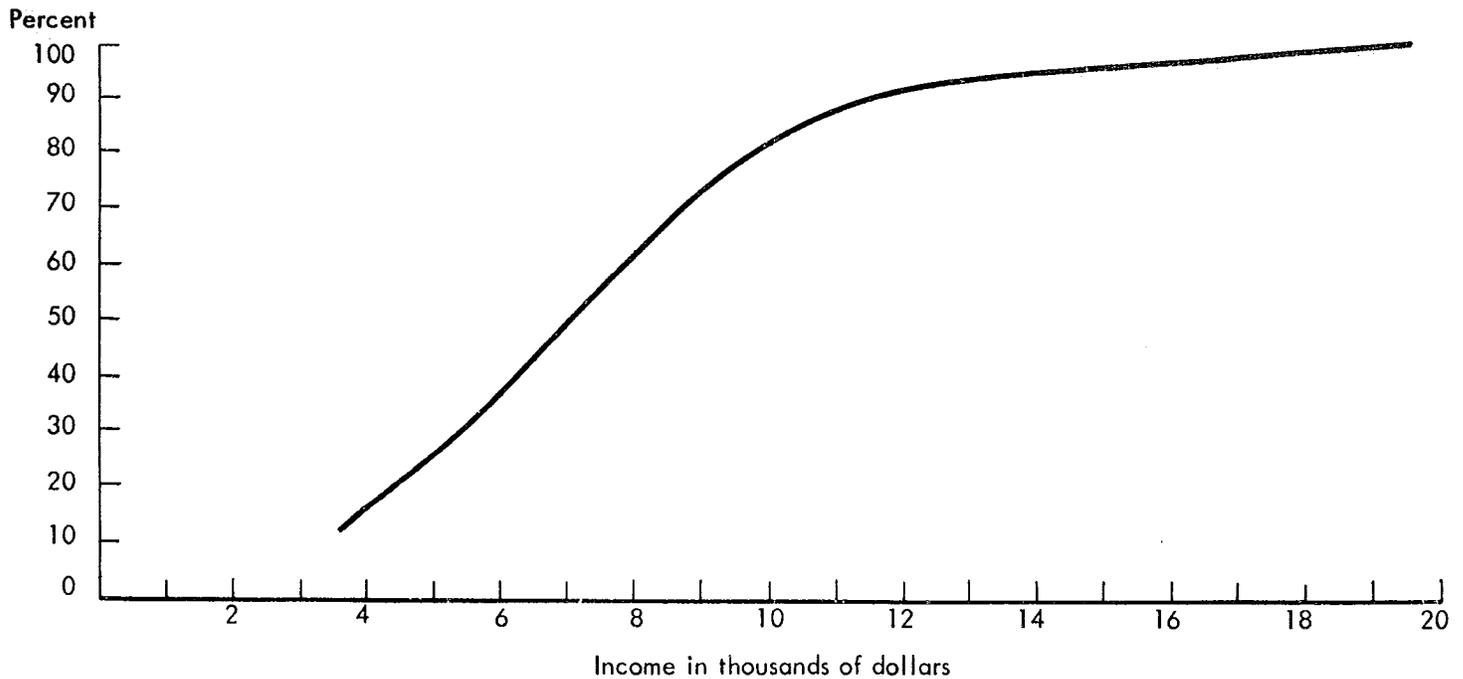
ESTABLISHING REVISED INCOME RANGES

Because the adjusted income ranges are at odd and uneven intervals, the market researcher may want to convert them into well rounded classes. A simple way to do this is to plot the cumulative distribution of column 6. In drawing the income distribution curve the *top* of each income range should be plotted. A curve is then drawn to connect the points. Because of the generally erratic manner of income distributions, the line joining the points may form an irregular curve. Frequently these irregularities are due to sampling variability. In order to obtain a more highly generalized trend the curve should be “smoothed out”. This may be done by drawing free hand or with a “french curve” a line through the plotted points which most nearly reflect the trend of the plotted points.

After the curve has been plotted, revised income ranges and the cumulative percent of families falling below these ranges may be read from the curve.

The following table provides an illustration of the use of graphic presentation in developing an adjusted income distribution. The family income ranges selected for this particular illustration are in terms of \$2,000, however, any other distribution of family income ranges could have been developed from the graph.

<i>Income Ranges</i>	<i>Cumulative Percent</i>	<i>Percent</i>
Under \$4,000	16.5%	16.5%
\$ 4,000 to \$ 5,999	40.0	23.5
\$ 6,000 to \$ 7,999	62.5	22.5
\$ 8,000 to \$ 9,999	81.0	18.5
\$10,000 to \$11,999	90.0	9.0
\$12,000 to \$13,999	95.0	5.0
\$14,000 or more	100.0	5.0



Graph 4
Adjusted Family Income Distribution

The cumulative percentages in worksheet 5, column 6, are plotted for the top of each income class. The percent of families in the revised income classes may then be read from the graph. For example, the income class \$5000 to \$6000, which falls between 25 percent and 37.5 percent, comprises 12.5 percent of all families.

ESTIMATING FAMILY INCOME FROM SECONDARY SOURCES OF INFORMATION

The estimates of effective demand for sales housing can be only as reliable as the income estimates upon which they are based. It is therefore imperative that the market researcher make every effort to obtain the best possible family income data.

Family income data are derived from sample surveys and are available for a limited number of Latin American cities. Some of these estimates appear to be of excellent quality and high reliability. In addition, wage and salary data have been collected in the censuses of several countries and provide generally reliable information on the earnings of employed persons.¹ For the bulk of the Latin American cities, however, no family income or salary and

¹ The following Latin American countries included questions relating to incomes or salaries and wages in their census enumerations: Brazil, Costa Rica, Dominican Republic, Mexico, Peru and Venezuela.

wage data, based on survey results, are available. In these instances, the market researcher will have to develop his own income estimates. These will have to be based upon such sources of information as social security records, minimum wage legislation, union data, and employment records.

The market researcher should investigate the reliability of existing income and wage data in all instances where there appears to be some doubt as to their reliability.

SALARIES AND WAGES

When obtaining wage and salary information, it is important to collect data for the broadest possible cross section of wage earners in order that the income estimates be representative of the entire community. The type of wage data available from the administrators of minimum wage laws and the social security offices will vary considerably. They will be influenced by local legislation and the number of workers covered by local labor laws. In some countries

complete data on workers employed in a wide range of establishments and occupations will be available; whereas in other areas the number of workers covered by social security will be very limited.¹

Even where labor laws provide for a broad coverage, some groups of employees may have their own separate social security systems, such as civil servants or railroad workers.

In obtaining salary and wage data, the market researchers must include all cash benefits such as overtime pay, bonuses, cost of living differentials and any other cash benefits to which the worker may be entitled, and which he generally obtains.

In countries where only a limited number of workers are covered by social security, salary and wage data can be obtained from local employers. Extreme care, however, must be taken to obtain wage information from a representative cross section of local employers.

SOURCE OF INCOME

In Latin American countries the principal sources of income to middle and lower income families are salaries and wages. Earnings derived from interest, rent, stock dividends, annuities and welfare payments comprise a very small portion of their total income. For this reason reliable income estimates may be derived from wage and salary data in Latin America.

ADJUSTING WAGE DATA FOR SECONDARY WORKERS

Due to the fact that very many of the lower and middle income families have more than one gainfully employed person, salaries and wages of individual workers cannot be equated with family income. To estimate total household income the salary and wage data must be adjusted

to reflect the presence of more than one worker in the typical family.

Unfortunately, there are ordinarily no statistical data available regarding the number of workers per family. Therefore, the adjustments of salary and wage data to reflect total family income are the most difficult and troublesome estimates the market researcher has to make. An adjustment factor which overstates the number of workers per household will inflate the income distribution; whereas an underestimate will deflate the family income estimates. It is, therefore, important for the market researcher to make a comprehensive investigation of the number of secondary workers per family.

RELIABILITY OF ESTIMATES

The income estimates obviously should be as accurate as possible. The fact, however, that they may lack absolute precision will not detract from the overall validity of the effective demand estimates. The relatively wide spread in the amount of income that families will budget for housing, combined with the broad price ranges within which the effective demand for housing is estimated, allows some leeway within which the income estimates may vary.

In Latin America the median number of workers per family fluctuates between 1.2 and 2.5. This varies with the rate of labor force participation, social customs, and income levels. Social security officials, labor union officers, welfare workers and local statistical officers should be queried by the market researchers to ascertain the ratio of workers per household.

ADJUSTING FOR CHANGES IN COST OF LIVING

Where salary and wage statistics are not current and where there have been changes in the income levels due to inflationary pressures, the data must be adjusted to show current earnings of workers. In the absence of wage indices, the market researcher can adjust available salary and wage statistics by changes in the Consumer Price Index. See page 21.

¹ The following countries have statutory limitations on the numbers of workers covered by social security: Costa Rica, El Salvador, Dominican Republic and Venezuela.

CHECKING RELIABILITY OF ESTIMATES

To test the reliability of the income distribution developed from salary and wage data, the market researcher should compare his results with such other income data as may be available. Particular emphasis should be placed on evaluating the estimated various levels, such as the median income level (50 percentile), and the income level below which 70 percent or 75 percent of all families fall. These two levels are generally comparable to the incomes of low middle income families. Comparability of these percentiles with informed opinions regarding the typical income of families at these two income levels will provide a good measure against which to evaluate the income estimates.

Some discrepancies between the statistically derived estimates and the opinions expressed by informed persons may be expected. Substantial differences, however, suggest that faulty statistical procedures might have been used by the analyst. In this event the market researcher should re-examine the salary and wage data which he used to assure himself of their reliability and representativeness. Also, he should re-evaluate the factors which he used to adjust the workers' salary and wage data to reflect family incomes.

Worksheet 6 provides an illustrative example of how a distribution of family incomes can be developed from secondary data sources.

INSTRUCTIONS FOR COMPLETING WORKSHEET 6 ESTIMATING FAMILY INCOMES FROM SECONDARY SOURCES OF INFORMATION

STEP I

Column 1 – Establish 10 to 12 salary or wage classes ranging from the lowest paid workers to employees in the highest paid positions. These salary and wage ranges will vary from locality to locality. They should correspond to salary and wage ranges adopted locally for reporting income.

Columns 2-8 – Enter the number of workers covered by social security programs or industries. Use one column for each salary and wage tabulation.¹

Column 9 – Add columns 2 through 8.

Column 10 – Compute percent of workers in each income range.

STEP II

Column 1 – Enter from worksheet 6, column 1, salary or wage ranges.

Column 2 – Adjust salary and wage data to reflect changes in the cost of living. (See instructions for completing worksheet 5, column 2, for detailed instructions.)

Column 3 – Multiply the top and bottom of each salary and wage range in column 1 by the adjustment factor in column 2.

Column 4 – The distribution of earnings in column 3 provide estimates of the salaries and wages of individuals. Because expenditures for housing are usually shared when more than one person within the household is gainfully employed it is important to obtain estimates of family income for housing market analysis purposes. An approximation of family incomes may be obtained by multiplying the individual wage earners income by the estimated number of workers in the family. In the absence of reliable statistics, local social security officials, economists and statisticians should be carefully questioned about estimates of the number of workers per household at various income levels. The estimated number of workers per family is entered in column 4.

Column 5 – The estimated family income ranges are estimated by multiplying the top and bottom of each adjusted salary and wage range in column 3 by the adjustment factor in column 4. The top of each income range must be rounded to assure continuation with each succeeding income range. Because the estimated family income ranges are at odd and uneven intervals, the market researcher may want to convert them into rounded class intervals.

¹ It is recognized that some families may have more than one worker covered by social security, just as there may be other families with a full time worker who is not covered by social security. It is believed that the errors tend to compensate one another and that the data provide a reasonably accurate base upon which to develop a distribution of families by income.

Worksheet No. 6

STEP I - ESTIMATING FAMILY INCOME FROM SECONDARY SOURCES

AREA		COUNTRY							YEAR
Managua		Nicaragua							1962
SALARIES AND WAGES PER Week* PERIOD Cordoba † CURRENCY	NUMBER OF PERSONS BY SOURCE OF EMPLOYMENT								
	Social Security Adminis- tration							TOTAL	PERCENT DISTRIBUTION
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Total	107,250							107,250	100.0%
Under 208	21,100							21,100	19.7
209- 364	19,000							19,000	17.7
365- 468	16,700							16,700	15.6
469- 624	12,900							12,900	12.0
625- 858	12,900							12,900	12.0
859-1,170	8,580							8,580	8.0
1,171-1,560	6,700							6,700	6.2
1,561-1,976	3,920							3,920	3.7
1,977-2,418	1,470							1,470	1.4
2,419 and over	3,980							3,980	3.7

NOTE: Instructions for completing worksheet 6 are provided in chapter 5 of the Housing Market Analysis Manual.

* Specify either hour, week, month, or annual rate

† Specify currency

Worksheet No. 6 continued

STEP II - ESTIMATING FAMILY INCOME FROM SECONDARY SOURCES OF INFORMATION

SALARIES AND WAGES PER Week* PERIOD Cordoba † CURRENCY	SALARY AND WAGE ADJUSTMENT FACTOR	ADJUSTED SALARIES AND WAGES	ESTIMATED WAGE EARNERS PER FAMILY	ADJUSTED FAMILY INCOME RANGES	ESTIMATED FAMILIES IN SPECIFIED INCOME RANGES		
					NUMBER	PERCENT	
						BY CLASS	CUMULATIVE
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Total	XXX	XXX	XXX	XXX	107,250	100%	XXX
Under 208	None	XXX	1.6	Under 332	21,100	19.7	19.7
209- 364	(No	XXX	1.6	333- 582	19,000	17.7	37.4
365- 468	Change	XXX	1.6	583- 748	16,700	15.6	53.0
469- 624	in	XXX	1.3	749- 811	12,900	12.0	65.0
625- 858	Consumer	XXX	1.3	812-1,115	12,900	12.0	77.0
859-1,170	Price	XXX	1.3	1,116-1,521	8,580	8.0	85.0
1,171-1,560	Index)	XXX	1.3	1,522-2,028	6,700	6.2	91.2
1,561-1,976		XXX	1.3	2,029-2,569	3,920	3.7	94.9
1,977-2,418		XXX	1.2	2,570-2,902	1,470	1.4	96.3
2,419 or more		XXX	1.2	2,903 or more	3,980	3.7	100.0

NOTE: Instructions for completing worksheet 6 are provided in chapter 5 of the Housing Market Analysis Manual.

* Specify whether hour, week, month, or annual rate.

† Specify currency.

For a detailed explanation of how to convert odd income ranges into even income groupings, see page 21.

Columns 6 and 7 – Enter the number and percent of workers from worksheet 6 – Step I – columns 9 and 10.

Column 8 – Compute cumulative percent distribution.

Chapter 6

HOUSING SUPPLY

Data concerning the volume and rate of new residential construction and the cost of housing are essential components of housing market analyses. They are needed by the researcher to estimate the backlog of housing demand and to provide a measure of the income required to afford housing in the unsubsidized sector of the housing market.

RESIDENTIAL CONSTRUCTION

The researcher must take into consideration the volume of previous residential construction. This has a direct bearing on the current effective demand. For instance, a community in which past residential construction has kept pace with household formations will have a substantially different demand schedule than a community in which building activity has not kept pace with household formations.

It is essential that the market researcher confine his statistics only to the volume of safe and sanitary residential construction. Substandard and inadequate residential construction should not be included. These units do not provide an addition to the stock of housing meeting locally established minimum standards of health and safety.

Housing construction records are maintained in many Latin American cities. Where accurate and reliable data are available, they provide a quick and simple means of determining the number of housing units built in any one year. Unfortunately, however, there appears to be substantial under-reporting of new construction in many countries.

BUILDING PERMITS

Some cities require that a building permit be obtained before new construction or alterations to existing structures takes place. The building permit data may cover both residential and nonresidential construction as well as alterations or repairs. It is important that the market researcher isolate permits for new residential construction from all the other permit data. Where no separate records are kept for the various types of permits issued, the researcher should consult with the personnel responsible for keeping the records to try to arrive at reliable estimates of the new residential construction.

The market researcher should also ascertain what proportion of building permits that are issued actually result in housing starts and completions. This check is necessary because in some areas a large number of building permits may be issued but will never be used.

The researcher should also evaluate the residential permit data in terms of the adequacy of reporting. Even in areas requiring building permits, much construction takes place without a permit. The researcher should try to determine the proportion of building not covered by permits and adjust his estimates of residential construction accordingly.

To the extent that he can, the researcher should attempt to estimate residential construction for each of the separate political jurisdictions within the housing market. In some cases the data may be published centrally, and the task of the researcher is made easier. In other cases the data will have to be obtained directly from each of the various political jurisdictions.

EXAMPLE

An example of the use of building permit data in market analysis is provided by the Mendoza housing market study. The analysis shows the adjustments made in the building permit data for under reporting and also for the fact that the authorizations include permits for remodeling, extension and alteration. These adjustments are illustrative of the corrections which are required in this particular case. Different circumstances will require varying methods of adjusting the statistical data.

“Between 1952 and 1962 a total of 23,866 residential building permits were issued in the Gran Mendoza area. These building permits include authorizations for remodeling, extension and alteration. Sources at the Provincial Housing Institute indicated the permits for alternations and extensions, approximated the number of dwelling built without a building permit. Based on this assurance, the building permit data were held to be a fairly reliable measure of residential construction activity in the Gran Mendoza.

“Preliminary building information for 1964 points to a construction volume of 700 to 800 units. This approximates the reduced level of activity in the year 1959. The decline in residential building activity is due to the curtailment of mortgage funds. Future trends in new residential construction will be dependent largely on the availability of capital funds for housing.

“For the first five year period, 1959 through 1963, an average of only 1100 housing units per year were authorized for construction. This is substantially below the estimated rate of 2500 household formations per year.”

OCCUPANCY AUTHORIZATIONS

Building permit data are most frequently used by communities in Latin America to keep a record on new residential construction. In addition, some localities maintain records of building inspections and building occupancy

authorizations. These data are equally useful to the market researcher and may be substituted for the building permit data.

Where no building permit data or occupancy authorizations are available, the market researcher must look to other sources of information for obtaining data on new residential construction.

ELECTRIC METERS

Electric light companies can report on the number of light meters installed each year. These data provide a good measure of residential construction only where a high proportion of the residences have electricity. In cities where only a limited number of houses have electricity, the use of electric meter statistics will result in a substantial underestimate of residential construction.

Some large housing projects, where electricity is included in the rent, may have only one master meter. To this extent housing estimates based on electric meter data may provide an undercount of units. Usually, however, the electric utility company can estimate the number of residential units not separately metered to permit an adjustment of the housing and vacancy data.

AERIAL PHOTOGRAPHS

Another source of residential construction estimates is aerial photographs. While it takes a certain amount of skill to interpret aerial photographs they do provide a means of arriving at a count of new houses by comparing aerial photographs taken at different periods of time. This method is best suited to estimating new construction in small towns or new suburban housing developments. In using this method, the researcher should work closely with a trained photo interpreter to achieve the best results.

The preceding paragraphs briefly describe some of the sources that may provide the construction statistics needed by the market researcher. These sources of information do not constitute a complete listing. Each locality

will have additional sources of statistical data which frequently will be found to be of great value. Every effort should be made to make sure that no source of information has been overlooked.

WHERE NO DATA AVAILABLE

There will be some localities for which no residential construction data are available and for which no statistical or quantitative estimates can be developed. In these instances the market researcher will have to rely on descriptive information supplied by local officials and other knowledgeable persons familiar with the local housing situation. In obtaining descriptive information, such general statements as the housing situation is "good" or "bad" should be avoided. Instead, the researcher should try to obtain specific information which would indicate the volume of past residential construction. City officials usually will be able, as a minimum, to provide rough approximations of the number of dwelling units that have been built over a given period, based on their general knowledge of the area.

HOUSING VACANCIES

Generally speaking there are few, if any, housing vacancies in Latin American cities. The market researcher, therefore, will usually not be troubled with the impact of vacant housing units upon the effective demand schedule.

In several cities, however, there may have been some over-building in high priced housing. The market analyst should therefore, as part of his study, inquire about housing vacancies.

Only where substantial vacancies occur, however, should the researcher investigate this matter in greater detail. When this occurs, he should try to obtain data on the number of vacant units by price range. Where substantial vacancies are noted, the effective demand schedule for housing must be adjusted to reflect the vacancy situation. (See chapter 9, entitled "Estimating Effective Demand" for details.)

HOUSING COSTS

The cost of housing including land and utilities determines how many families will be able to purchase housing in the private market. The lower the price at which new housing can be produced, the larger will be the number of families who will have sufficient income to afford such housing.

HOW TO ESTIMATE

To determine the income level which divides the private market from the subsidized market, the analyst must ascertain the lowest prices at which a substantial supply of housing meeting locally determined minimum standards of acceptance is produced.

Information regarding the lowest prices at which new housing is being sold can be obtained from builders and realtors — the men who build and sell such housing. They will usually be able to furnish detailed information regarding the prices of new construction and the additional features provided in these dwelling units.

To determine the lowest cost for new housing, the researcher should be guided by local minimum standards for an average size house (usually for a three-bedroom unit). The cost estimate should include a building lot of adequate size, sufficient living area, and adequate plumbing to meet basic housing requirements. Thus, both substandard housing as well as dwelling units which exceed minimum property standards should be excluded in estimating the lowest cost at which private enterprise can supply housing. The cost of one or a very few exceptionally low priced units which could not be readily duplicated at the same price, should not be used as the norm upon which to make the cost determination.

EXAMPLE

An illustration of how to establish the lowest cost of sales housing is provided by the Mendoza market area.

“The lowest price level at which housing can be provided currently by private enterprise in the Gran Mendoza area without recourse to any public subsidy is about 500,000 pesos. This includes the cost of land and all improvements.

“Relatively few units, however, are built at this price level. The lowest price at which a supply of housing reaches the market is about 650,000 pesos. At this price level several builders are providing row houses with 70 square meters (753 square feet) of living area. The units contain three bedrooms, a combination living-dining room, kitchen, bathroom and a small enclosed backyard. A somewhat larger volume of houses is reaching the market at 690,000 pesos and 720,000 pesos.

“One building society was selling three-bedroom units containing about 93 square meters for 700,000 pesos. An architectural firm was prepared to sell 2- and 3-bedroom units for about 800,000 and 900,000 pesos, respectively. Houses exceeding 1,500,000 pesos usually are individually designed, detached units with special features. Frequently they will be more centrally situated on higher priced land.”

VISITS TO HOUSING DEVELOPMENTS

The best test of a housing market, in terms of effective demand, construction volume, price and the ability of families to afford housing at

various price levels is the actual sales experience of local builders. The market researcher should, therefore, make every effort to visit new housing developments and to discuss with builders and realtors their sales experience.

During the course of these discussions, the researcher should obtain information on the cost of the dwelling units, financing terms, and the income and the ability of the buyers to make the required downpayments.

Information should also be obtained on the rate of sales in terms of duration between completion of a unit and its sale. Where long waiting lists exist, information should be obtained on the incomes of the families seeking housing and their ability to make the necessary downpayments.

Builders and realtors should also be questioned about any vacancies, unsold housing inventories and price levels at which housing appears to be over built. Where unsold housing inventories exist, the underlying reasons for the situation should be ascertained, i.e., poor location, bad design, or high cost.

The market researcher's recommendations should be evaluated in the light of the actual experience of the local building industry. Sales experience in terms of the amount of downpayment families can make, the amount of mortgage payments they can afford in relation to their incomes and the rate at which new houses are sold all provide valuable indicators of effective housing demand.

Instructions for Completing Worksheet No. 7

OCCUPANCY AUTHORIZATION OR BUILDING PERMIT DATA

Column 1 – Enter names of all minor civil divisions in housing market area.

Column 2 – Add columns 3 through 6.

Columns 3 through 6 – Enter number of occupancy authorizations issued or number of building permits for houses actually completed or under construction over the past three years in each minor civil division. Do not include building permits that did not result in construction or counts of substandard housing units. Ordinarily building permit data are collected on a calendar year basis. For housing market analyses purposes, data should be adjusted up to month during which housing study is made. For example, if a study is completed in June 1964 then the building permit data should be adjusted to show a count of permits covering the three year period starting with July 1961 and ending with June 1964.

If building permit data covers an area larger than the housing market the statistics need to be adjusted to reflect construction solely within the area under study.

Chapter 7

HOUSING DEMAND BACKLOG

The total housing demand in any area is made up of two major and distinct components. Each must be estimated separately. Chapter 6 discussed the procedure for estimating future effective demand based on expected household formations. This chapter deals, in turn, with the backlog of housing demand in Latin America resulting from: (a) The deficit in housing resulting from new family formations which exceed new residential construction, (b) housing requirements of families living under substandard conditions due to inadequate housing or overcrowding, and (c) replacement needs growing out of the obsolescence and deterioration of the existing housing stock.

The techniques used to estimate future demand on the basis of expected household formations are well developed and have been found to be reliable. Equally reliable means of estimating the backlog of effective housing demand, however, do not exist. Experience is lacking regarding housing market behavior in Latin America which would point to a reliable method by which the backlog of housing demand can be measured.

The fact that a substantial backlog of effective housing demand exists is well established. Its magnitude, in terms of the number of families willing and able to purchase new housing in the private market, however, has never been fully explored. The following discussion suggests a technique to gauge within broad bounds of reliability this backlog of demand. For most purposes, the estimates derived by the suggested technique will satisfy the needs of the market researcher. As more knowledge and experience are obtained regarding market behavior in Latin American countries, the techniques of measuring the backlog of effective housing demand can be refined.

DEMAND RESULTING FROM HOUSING DEFICIT

In many Latin American cities residential construction has failed to keep pace with household growth. The heavy immigration of rural families into urban centers, combined with natural population increases, has led to a rate of new family formation which is substantially greater than the rate at which the building industry has constructed new housing units.

HOW TO COMPUTE

The difference between the volume of new family formation and residential construction is the housing demand backlog. For instance, a community with a rate of 2,500 household formations per year and a residential construction volume of only 2,000 units per year would accumulate an annual housing deficit of 500 units per year.

For a discussion of how to obtain data on new residential construction see chapter 6, entitled *Housing Supply*.

In this example, 500 families per year would have had to "double-up" with other households or would have had to resolve their housing problem by building illegal squatter shacks. Not all of the new families would have had sufficient income to afford new housing even if it had been available. However, some would have occupied older dwellings vacated by other families who would have moved into the new units.

In computing the housing demand backlog, it could be said that the market researcher should go back in time for as long a period as household formations exceeded residential construction. From a practical point of view,

however, this is not feasible. Statistical information employed to determine the housing backlog become less and less reliable with the passage of time.

It should also be remembered that even where housing shortages exist there are opportunities for families to upgrade their housing. As a result, a substantial number of these families will have satisfied their housing wants over the years and, to this extent, no longer constitute a housing demand factor.

CUT OFF POINT

The cut off point in time beyond which the housing demand backlog should not be computed is difficult to establish.

From the market researcher's point of view, a period covering the past three years would appear to provide a reasonable span of time over which reliable estimates can be developed without undue difficulty. It can also be argued that any period which exceeds three years would substantially reduce the number of families constituting the backlog demand because many of these families would have been able to satisfy their housing wants over a longer period of time.

THREE YEAR LIMIT

For practical reasons, therefore, it is considered expedient to limit to three years the period over which the housing demand backlog should be computed.

EXAMPLE

The following illustration from the Mendoza, Argentina Market Analysis, provides an example of how to estimate the housing demand backlog.

New household formations in Mendoza for the years 1962, 1963, and 1964 were computed by dividing the estimated population, as read from the straight line population projection, by the estimated family size.

The number of dwelling units built in 1962, 1963 and 1964 was then subtracted from the total number of households for the three-year period to arrive at the estimated housing deficit.

Worksheet 8 provides an illustration and tabular example of how backlog demand estimates can be computed.

OTHER SOURCES OF HOUSING DEMAND BACKLOG

Only the housing deficit, resulting from the difference between new household formations and new residential construction, adds to the overall effective demand for housing. The backlog of housing needs of low income families who reside under substandard or overcrowded housing conditions because they have insufficient income to afford sound housing, and the housing replacement needs which result from the obsolescence of the existing safe and sanitary housing supply do not add or detract from the general effective demand schedule.

In either instance, from the market researchers point of view, these low income families would fall within the subsidized segment of the housing market. Their low incomes do not permit them to participate in the private sector of the market which this manual attempts to define and measure.

REPLACEMENT HOUSING

The need for replacement housing stems, for the main part, from the fact that housing "wears out", or is destroyed by fire and other natural hazards or is demolished to make space for industrial and commercial uses and highway construction. This housing needs to be replaced with new dwelling units. Ordinarily the life-span of a house is estimated at 50 years. A replacement factor of two percent would provide for a complete replacement of all buildings once every 50 years.

Because of the extreme housing shortage in most of Latin American countries, all shelter,

Worksheet No. 8

ESTIMATE OF HOUSING DEMAND BACKLOG

AREA Mendoza	COUNTRY Argentina	YEARS 1962 - 1964
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Step I - Estimate of Household Formations During Past Three Years

LINE NO.		PERIOD (1)	ESTIMATED POPULATION (2)	ESTIMATED HOUSEHOLD (3)	ESTIMATED NUMBER OF HOUSEHOLDS (4)	ESTIMATED HOUSING DEMAND (5)
1	Current Year	1964	408,000	4.5	90,667	
2	Current Year Less 3 Years	1962	377,000	4.5	83,778	
3	Estimated Household Formations (Column 4, line 1 less line 2)					6,889

Step II - Estimate of Dwelling Units Completed

LINE NO.	YEAR (1)	ESTIMATED NUMBER OF UNITS COMPLETED (2)	
4	1964	700	
5	1963	1,422	
6	1962	2,158	
7	Total (Line 4 + line 5 + line 6)		4,280

Step III - Estimate of Housing Demand Backlog

8	Total (Column 5, line 3 less line 7)		2,609 *
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* Enter in worksheet 10, line 10.

Instructions for Completing Worksheet No. 8

ESTIMATE OF HOUSING DEMAND BACKLOG

Step I

Column 1 – Enter the years covered by the backlog estimates in lines 1 and 2.

Column 2 – Enter the estimated population for the years indicated in lines 1 and 2.

Column 3 – Enter the estimated household size in lines 1 and 2.

Column 4 – Divide the population in column 2 by the size of household in column 3 to obtain the estimated number of households.

Column 5 – Column 4, line 1 less line 2 provides an estimate of the number of household formations during past three years.

Step II

Column 1 – Enter years covered by backlog estimate in lines 4, 5, and 6.

Column 2 – Enter number of dwelling units built in each year.

Column 5 – Add column 2 and enter total in column 5, line 7.

Step III

Column 5 – Subtract column 5, line 7 from line 3 to obtain the estimate of total housing demand backlog.

regardless of age, is utilized. Under these circumstances, virtually no housing is demolished because of obsolescence. Many of the dwelling units that have outlasted their normal span of life have turned into dismal slums. Nonetheless, they continue to be occupied -- mostly by low income families.

The analytical problems related to replacement of housing units that have deteriorated are identical to those involving all slum housing. These are problems of social and governmental nature, not of private housing market operations. The rate at which substandard housing will be replaced is based on government determined policies, and these cannot be measured in terms of the supply and demand criteria which form the basis of housing market analysis.

A SUBSTANDARD HOUSING

As indicated in the introductory chapter, the techniques outlined in this basic manual are concerned primarily with estimating the effective demand for housing built without governmental subsidies for families whose incomes are sufficient to be able to afford housing meeting minimum local physical standards in the private market. Reductions in the cost of housing can be achieved by reducing physical standards to the extent that the community is willing to accept lower housing standards. Thereby a larger segment of low income families can be housed without public subsidy.

The determination of the housing needs of low-income families in substandard housing requires a different approach. No attempt is made in this manual to outline procedures with which to estimate the tremendous housing needs of the inadequately housed families in Latin America.

Chapter 8

PRICES OF HOUSES FAMILIES CAN AFFORD

The development of effective demand estimates for sales housing assumes that families at various income levels are able and willing to allocate certain proportions of their income to pay for the amortization and interest charges on a mortgage. On the basis of this assumption, the market researcher can relate family income to the price of housing a family can afford by converting the income into the maximum amount a family is able to pay for monthly amortization and interest charges. This latter amount may be translated into a mortgage which, in turn, may be converted into the cost of a house.

In the absence of statistical data, the researcher should consult with informed persons on the proportion of income families at various income levels may be expected to allocate to pay interest and amortization on a mortgage.

HOUSING TO INCOME EXPENSE RATIO

For most market analysis purposes an income-to-housing-expense ratio of 15 percent to 35 percent appears appropriate.¹ Normally a family may be expected to allocate one quarter of its monthly income for amortization and interest payments on a mortgage. However, this proportion will vary from country to country and among families of different income levels.

A housing market analysis, for example, of Tegucigalpa, Honduras showed that families with less than 1,500 Lempiras (US \$750) per year could not afford to spend more than 20 percent of their income for housing. Families with incomes ranging from 1,500 Lempiras to 4,000

Lempiras (US \$750 - \$2,000) were able to spend 22 percent of their incomes for housing, whereas families with incomes exceeding 4,000 Lempiras (US \$2,000) per year were assumed able to afford to spend as much as 25 percent of their income for housing.

The varying sums families can allocate for housing will support mortgages of varying amounts depending on interest rates and the length of the mortgage maturity. A low interest rate and long term mortgage will require smaller monthly payments than a high interest rate and short term mortgage.

By utilizing the lowest interest rates and the longest mortgage terms available in the market, the researcher will be able to estimate the maximum mortgages families at various income levels will be able to obtain. These mortgage amounts must then be translated into sales prices by adding to the mortgages the required downpayments on the house. On the basis of these calculations, the market analyst will be able to develop a graph from which he can read the percentage of families able to purchase housing within different price ranges. From this information, he may then proceed to estimate the number of families who can afford housing at various price ranges. The development of these estimates is shown and explained in the following instructions.

INSTRUCTIONS FOR COMPLETING WORKSHEET 9 ESTIMATED PRICES FAMILIES AT VARIOUS INCOME RANGES NORMALLY PAY FOR SALES HOUSING

Several computations are involved in relating household income to the amount families will normally pay for housing.

¹ Includes interest and amortization of mortgage and cost of property taxes, utilities and maintenance.

Columns 1 and 2 – As a first step the market researcher should enter in columns 1 and 2 respectively the previously estimated “Adjusted Family Income Ranges” and the cumulative percent of “Estimated Families in Specified Income Ranges.”

In areas where family income data are available, the market researcher will have developed these estimates in worksheet 5, columns 3 and 6. In areas lacking family income data, the analyst will have developed his own income estimates in worksheet 6, step II, columns 5 and 8. (NOTE: *If incomes were previously estimated on an annual basis they should be divided by 12 to supply monthly figures. Where data were obtained on a weekly basis, they should be multiplied by 4.3 to obtain monthly figures.*)

Column 3 – Enter as a percentage, the proportion of income families will typically allocate for amortization and interest payments as determined during the course of discussions with knowledgeable persons in the locality.

Column 4 – Column 2 multiplied by column 3 provides the estimated ranges of maximum monthly mortgage payments families at various income levels can afford.

Column 5 – The maximum mortgage that can be obtained with a given monthly payment will vary considerably depending on the interest rate and the mortgage term. The market researcher, in estimating the maximum mortgage amounts, should use such interest rates and mortgage terms as will be or are available.

Exhibit A provides amortization factors for interest rates ranging from 5 percent to 10 percent per annum and mortgage terms ranging from 5 years to 30 years. In the given example, an interest rate of 8 percent and a mortgage term of 15 years were used. The amortization factor, based on these financing conditions, as shown on the amortization chart, exhibit A, amounts to 9.56 per 1,000 monetary units. This means that 9.56 (pesos or other currency) will have to be paid monthly for each 1,000 (pesos or other currency) of mortgage indebtedness for 15 years, the term of the mortgage.

Column 6 – The sums in this column represent the estimated maximum mortgages families within various income ranges can obtain at the given financing terms. The amounts are derived by dividing column 4 by column 5 and multiplying the sum by 1,000. This means, for example, that a family able to pay 3,949 pesos per month for housing, will be able to support a mortgage of 413,075 pesos.

Column 7 – Most mortgages will finance only a part of the total cost of a house. The difference between the mortgage and the cost of the house is made up by the downpayment. This downpayment will vary depending on local conditions.

Since the mortgage will cover only a part of the total cost of the house an amount equal to the downpayment must be added to the mortgage in order to arrive at the estimated sales price of the house. The downpayment in this example amounts to 25 percent. To estimate the sales price the mortgage amount must be adjusted upward by 1.333 to reflect a downpayment of 25 percent. Downpayment requirements of 20 percent and 15 percent would call for multipliers of 1.25 and 1.176 respectively.

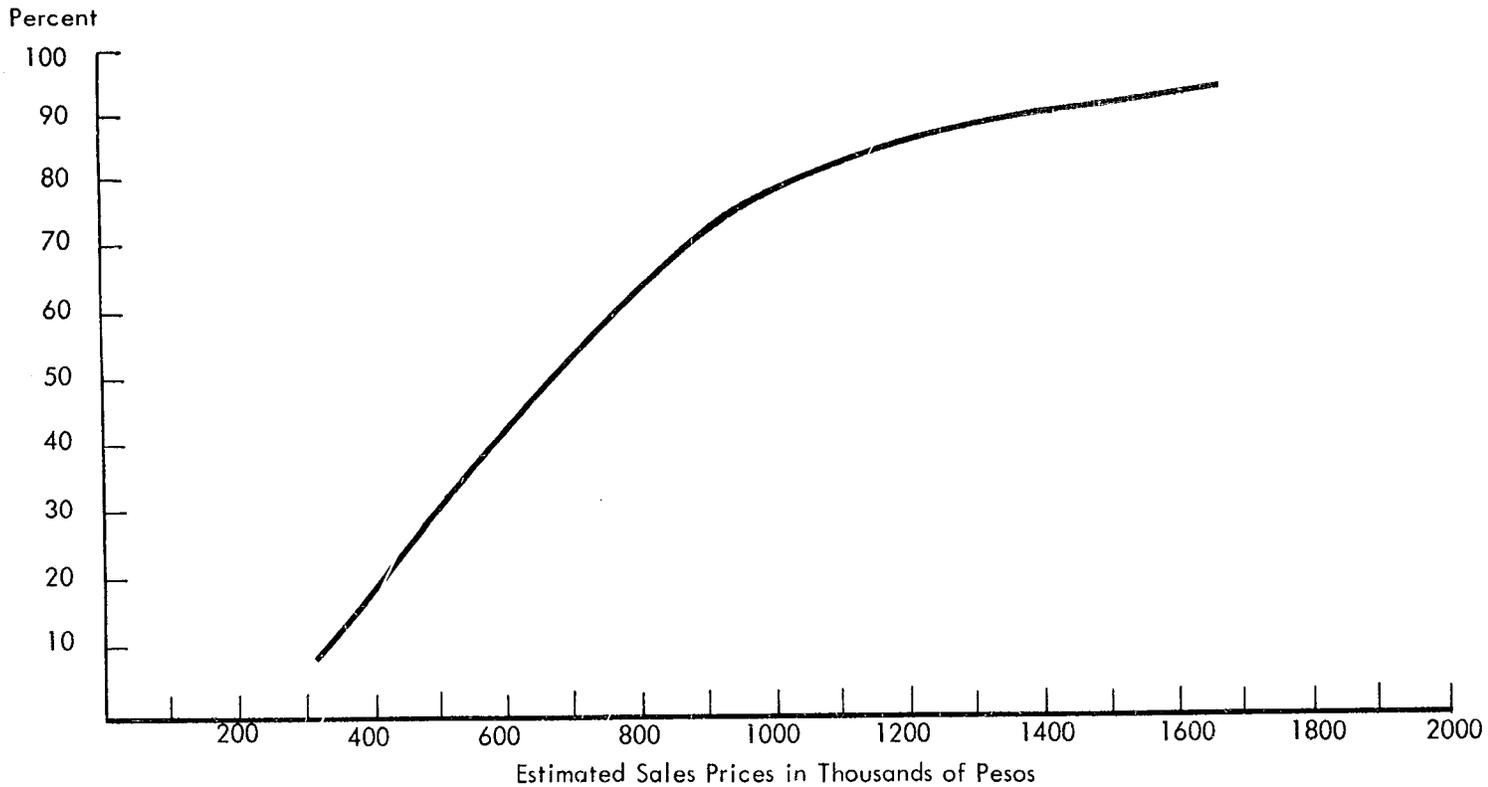
The multiplier is obtained by dividing 100 percent by the maximum mortgage ratio. For example, the multiplier for a 25 percent downpayment is $100\% \div 75\%$ (the maximum mortgage) = 1.333.

Column 8 – The estimated range of sales prices is arrived by multiplying column 6 by column 7.

As indicated previously the purpose of the worksheet is to relate family income to the cost of housing. Column 8 shows the estimated prices families within various income ranges can pay for houses.

Because the price ranges were arithmetically computed they present an irregular price distribution. For ease and convenience, they should be converted to broad price ranges of regular intervals.

This may be done by plotting the cumulative percentages (column 1) and the top of each



Graph 5

*Cumulative Percentage Distribution of Estimated
Prices of Houses Families can Afford - Mendoza, Argentina, 1964*

price range on a graph. (See graph 5.) From this graph, the market researcher may develop a schedule of the percent of families able to purchase housing within a well rounded set of price ranges that reflect more closely the prices at which housing is reaching the market.

The top of each sale price ranges in column 8 should be plotted graphically by the percent

in column 1. The plotted points should be connected free hand or with the help of a "french curve" to present a smooth curve.

It should be noted that in order to obtain a fairly smooth curve, it will usually not be possible to connect all the plotted points.

Worksheet No. 9

ESTIMATED PRICES FAMILIES AT VARIOUS INCOME RANGES WILL NORMALLY PAY FOR SALES HOUSING

AREA			COUNTRY				YEAR
Mendoza			Argentina				1964
CUMU- LATIVE PERCENT	ESTIMATED FAMILY INCOME (Monthly)	RATIO OF MORT- GAGE PAYMENT TO INCOME	ESTIMATED MAXIMUM MORTGAGE PAYMENT (Monthly)	ADJUST- MENT FACTOR FOR COMPUTING MAXIMUM MORTGAGE	ESTIMATED MAXIMUM AMOUNT OF MORTGAGE	MULTI- PLIER FOR DOWN- PAYMENT ADJUST- MENT	ESTIMATED SALES PRICE OF HOUSE
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Pesos		Pesos		Pesos		Pesos
8.0%	less than 8,800	25%	less than 2,200	9.56	under 230,125	1.33	under 306,066
19.9	8,800 to 11,899	25%	2,200 to 2,974	9.56	230,126 to 311,088	1.33	306,067 to 413,747
32.8	11,900 to 15,799	25%	2,975 to 3,949	9.56	311,089 to 413,075	1.33	413,748 to 549,390
52.0	15,800 to 18,449	25%	3,950 to 4,612	9.56	413,076 to 482,427	1.33	549,391 to 641,628
68.0	18,450 to 23,849	25%	4,613 to 5,962	9.56	482,428 to 623,640	1.33	641,629 to 829,441
76.6	23,850 to 27,099	25%	5,963 to 6,774	9.56	623,641 to 708,577	1.33	829,442 to 942,381
86.8	27,100 to 36,899	25%	6,775 to 9,224	9.56	708,578 to 964,854	1.33	942,382 to 1,283,256
90.1	36,900 to 40,499	25%	9,225 to 10,124	9.56	964,855 to 1,058,996	1.33	1,283,257 to 1,408,465
94.0	40,500 to 47,999	25%	10,125 to 11,999	9.56	1,058,997 to 1,255,125	1.33	1,408,466 to 1,669,316
95.0	48,000 or more	25%	12,000 or more	9.56	1,255,126 or more	1.33	1,669,317 or more

NOTE: Instructions for completing worksheet 9 are provided in chapter 8 of the Housing Market Analysis Manual. If incomes were previously obtained on an annual basis, they should be divided by 12 to supply monthly figures. Where data were obtained on a weekly basis, they should be multiplied by 4.3 to obtain monthly figures.

Chapter 9

ESTIMATING EFFECTIVE DEMAND

The previous discussions have described the data requirements and techniques used to develop estimates of the number of families who have sufficient income to afford new housing.

This chapter describes how to estimate the number of housing units, at various price levels, which families may be expected to purchase during the market forecast period.

The many unknown factors involved in measuring effective demand make it advisable to express the housing demand in the broadest possible price classes. At the bottom of the range would be the housing units serving families who generally have insufficient income to improve their housing without some form of government assistance. Above this lowest range of housing costs would be those families who can satisfy their shelter requirements in the private housing market. These are the families that have sufficient income to be able to afford decent, safe and sanitary housing without government assistance.

The estimates of effective housing demand developed by this manual provide a measure of the number of families able to afford housing at various price levels in the private housing market. Families who require some form of public subsidy to improve their housing are excluded from the final effective housing demand estimates described in this chapter.

DOWN PAYMENT

In estimating effective demand for housing, one important criterion is the ability of families to meet the downpayment requirements. Unfortunately, there is ordinarily very little data available regarding the cash assets of families.

In an inflationary economy, the market researcher will usually find that the lower and middle income families have little, if any, savings with which to make a downpayment on a house. Even in stable economies a large segment of middle income families must be placed in the public housing sector because of their inability to accumulate the necessary downpayment. Some of this market could probably be served by private enterprise if lower downpayments and longer mortgage terms prevailed.

It is important to determine the proportion of families at various income levels who have the resources to meet specified downpayment requirements. Inasmuch as there are no statistics available that will provide the required information, the market researcher will have to fall back on informed opinion.¹

Bankers and savings and loan association officials will frequently be able to provide general estimates to guide the market researcher. In obtaining information on the ability of families to make downpayments, the researcher should attempt to relate the assets portion to the income classifications. For example, this information may be expressed in terms of: 70 percent of the families in the 50,000 peso to 100,000 peso income range have the necessary downpayment, and 90 percent in the 100,000 pesos to 150,000 pesos class would have such assets. All families with incomes over 150,000 pesos have the assets to meet the downpayment requirements.

¹ In some countries individual social security deposits may be drawn on by the depositor for purposes of making a downpayment on a dwelling unit.

HOUSING NEEDS

No attempt has been made to develop instructions in this manual on how to estimate housing needs of low income families living under substandard conditions. The determination of their needs requires a different approach since the improvement of their living conditions will depend partly on public policies and public appropriations rather than the economic factors of supply and demand which underlie housing market analysis techniques.

There is not sufficient evidence regarding the motivation for home purchase in Latin American countries. It can be assumed, however, that the reasons do not differ greatly from those in the United States. These reasons include the need for a home, a desire to improve living conditions on the basis of improved economic status, pride in home ownership and desire for a better neighborhood and environment.

Whatever the motivations or reasons for home purchase may be, the prices at which housing can be built and marketed are directly related to the family income and assets position of all of the households in the area.

CONCLUSION

The housing market analysis technique developed in this manual will assist housing officials in Latin America to estimate with reasonable accuracy, the effective demand for housing within various price ranges.

Worksheet 10, for example, indicates that in Mendoza the effective demand for housing at the higher price levels is fairly limited. The effective demand for units priced in excess of 1,300,000 pesos amounts to only 350 units. Residential construction at this price level exceeding the indicated number of units may be difficult to sell and private builders would be advised to construct houses designed to serve a lower income range.

The estimates of effective demand based on such data as are currently available in most of Latin America will provide a reasonably accurate reflection of local market conditions.

However, improvements planned by many countries in the coverage and quality of the statistical information, particularly in the area of family income and home construction data, will assure greater accuracy in market analyses in the future.

The effective housing demand derived by the technique outlined in this manual provides estimates solely for sales housing. In areas where there is an effective demand that can be expected to result in the construction of new rental housing, the market analyst should allocate an appropriate share of the demand schedule to the rental market.

The estimates of effective housing demand, derived by means of the technique outlined in this manual, will enable housing officials, mortgage bankers, builders and realtors and the many other professions which are a part of the building industry to formulate long term housing policies and plans for residential construction. The effective demand estimates will make it possible to formulate and direct housing programs to serve specific income levels which in the long run will result in a more efficient use of housing resources.

INSTRUCTIONS FOR COMPLETING WORKSHEET 10 ESTIMATING THE EFFECTIVE DEMAND FOR HOUSING

The final step of estimating the effective demand for sales housing consists of adding the total number of new household formations and the housing demand backlog and distributing the number in accordance with the ability-to-pay and assets position of all households in the housing market area.

Column 1 – As a first step the market researcher should establish broad price ranges for sales housing. Families are allocated to each of these price classes according to their ability to afford housing.

The lowest price class should be rounded to a figure which will represent a sales price sufficiently low to take in all families falling below the first 10 percent. In illustrative worksheet 9, eight percent was selected which corresponded to a sales price of 306,066 pesos and the lowest price class in worksheet 10, column 1 was rounded to “under 300,000.”

Worksheet No. 10

ESTIMATE OF EFFECTIVE DEMAND FOR HOUSING

AREA			COUNTRY				YEAR
Mendoza			Argentina				1964 - 1967
LINE NO.	PRICE CLASSES (1)	CUMULATIVE PERCENTAGE (2)	PERCENTAGE BY CLASS INTERVALS (3)	ESTIMATED NUMBER OF FAMILIES ABLE TO AFFORD HOUSES (4)	ADJUSTMENT FACTOR FOR FAMILIES WITHOUT DOWNPAYMENT (5)	ESTIMATED NUMBER OF FAMILIES HAVING NECESSARY DOWNPAYMENT AND ABLE TO AFFORD HOUSES (6)	ESTIMATED NUMBER OF FAMILIES UNABLE TO AFFORD HOUSING IN THE PRIVATE MARKET (7)
1	Under <u>Pesos</u> 300,000	10	10	1,010			1,010
2	300,000 to 499,900	37	27	2,730			2,730
3	500,000 to 699,900	64	27	2,730	40%	1,092	1,638
4	700,000 to 899,900	78	14	1,415	60%	849	566
5	900,000 to 1,099,900	86	8	810	100%	810	
6	1,100,000 to 1,299,900	90	4	404	100%	404	
7	1,300,000 or more	100	10	1,010	100%	1,010	
8	.Total *			10,109 *		4,165	5,944

9. Total Family Formations (Enter from worksheet 4, line 3, column 4)
10. Plus Housing Demand (Enter from worksheet 8, line 8, column 5)
11. Total Housing Demand (Enter in line 8, column 4)

7,500
<u>2,609</u>
10,109 *

NOTE: Instructions for completing worksheet 10 are provided in chapter 9 of the Housing Market Analysis Manual. Subtract vacancies from appropriate price class in column 6.

The highest sales price should be established to include sales houses priced to serve families at the top 90th or 95th percent of the income distribution. In worksheet 9 these would be families who can pay 1,283,257 pesos or more for their house. In this instance the price class was rounded to 1,300,000 pesos in worksheet 10.

The price classes between 300,000 pesos and 1,300,000 pesos were divided into equal ranges of 200,000 pesos.

Column 2 – From graph 5, which shows sales prices by percent of families able to afford housing at different prices, the cumulative percentage of families in various price ranges in column 1 is read.

Column 3 – By subtraction the percent of families able to afford housing at various price ranges is computed.

Column 4 – Enter in line 8, column 4 the total housing demand (household formations plus backlog) from worksheets 4 and 9 and multiply by the percentages in column 3 to determine the distribution of housing demand by price range. The total estimated housing demand comprises the total increase in new households plus the housing demand backlog.

Column 5 – Draw a double line across the worksheet at the top of the lowest price interval at which private enterprise, unaided by public subsidy, can build a substantial supply of housing units. This demarcation line divides the housing market into two parts: (a) the public sector comprising families who require some form of housing subsidy to improve their housing, and (b) the private sector made up of families who are able to afford housing developed by private enterprise without government assistance.

In the example cited the lowest price for private housing was 500,000 pesos. A double line was drawn at the top of the 300,000 to 499,900 price interval. If the lowest price for private housing should fall within a price interval estimate the percent of families falling above and below the price line. Families falling above the price line generally have insufficient income to afford housing in the private market.

Enter the estimated percent of families who can afford to make the required down-payment at the various price ranges based on interviews with local financial institutions or other qualified local sources. In the sample worksheet, it was estimated that only 40 percent of the families which had sufficient incomes to meet the amortization payments on a 500,000 pesos to 699,900 pesos house also have the required 25 percent downpayment.

Column 6 – Multiply column 5 by column 4 to estimate families who can afford housing and have the necessary downpayment. These families comprise the private housing market. Where the market researcher finds a substantial number of completed houses that have not been sold because of a lack of home purchases at that particular price level, he must adjust the effective demand schedule to this vacancy condition. Vacancies, however, which are caused by poor location of the housing, bad design, or faulty construction are not a reflection of saturation of the market. Such vacancies should not be considered in the demand schedule.

The following example will serve to illustrate this required adjustment. Some 100 houses priced at 1,150,000 pesos were found to be vacant and could not be sold because of the saturation of the housing market at that price level.

The researcher should enter in the footnote of worksheet 10 the number of unsold units by price range. Column 6 is adjusted to reflect these vacancies by subtracting from the units (404) within the appropriate price range (1,100,000 pesos to 1,299,000 pesos) the number of unsold units—(100). The balance of units (304) is the remaining effective demand for units within that price range. If the number of unsold units is larger than the indicated effective demand for that particular price range, zero should be entered in lieu of a negative value in column 6.

However, if the 100 vacant units could not be sold because they were too far from the city, no adjustment in worksheet 10 is needed.

Column 7 – By subtracting column 6 from column 4 compute the number of families who have insufficient funds to meet the downpayment requirements. These families can be housed in private market only if downpayments are reduced and mortgage terms are extended to assure lower monthly amortization payments even though the mortgage will be increased by the reduction in the downpayment.

EXHIBIT A

**MONTHLY AMORTIZATION FACTORS
PER THOUSAND UNITS OF CURRENCY**

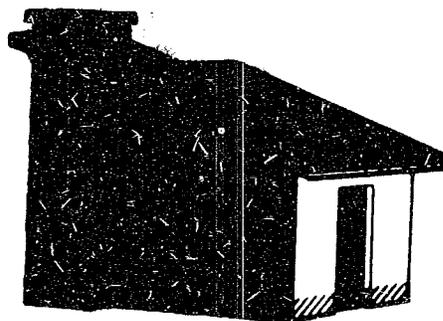
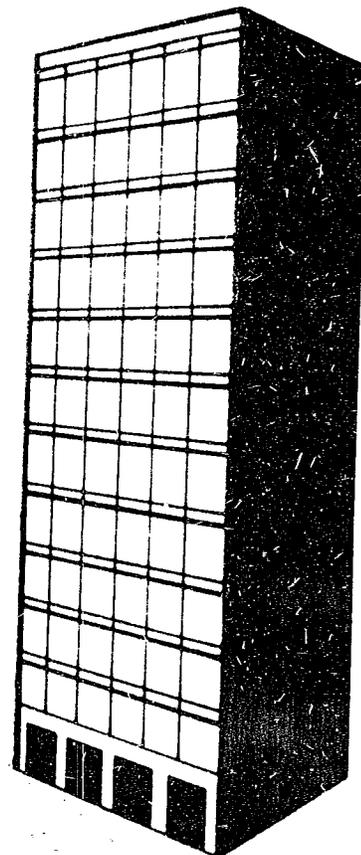
<u>Term in Years</u>	<u>5%</u>	<u>5½%</u>	<u>6%</u>	<u>6½%</u>	<u>7%</u>	<u>7½%</u>	<u>8%</u>	<u>8½%</u>	<u>9%</u>	<u>9½%</u>	<u>10%</u>
5	18.88	19.11	19.34	19.57	19.80	20.04	20.28	20.52	20.75	21.00	21.25
6	16.11	16.34	16.58	16.81	17.05	17.29	17.53	17.78	18.02	18.27	18.52
7	14.14	14.38	14.61	14.85	15.09	15.34	15.58	15.83	16.09	16.34	16.60
8	12.66	12.90	13.15	13.39	13.63	13.88	14.13	14.39	14.65	14.91	15.17
9	11.52	11.76	12.01	12.25	12.51	12.76	13.01	13.28	13.54	13.81	14.08
10	10.61	10.86	11.11	11.35	11.61	11.87	12.13	12.40	12.67	12.94	13.21
11	9.87	10.12	10.37	10.62	10.88	11.15	11.41	11.69	11.96	12.24	12.52
12	9.25	9.51	9.76	10.02	10.28	10.55	10.82	11.10	11.38	11.66	11.95
13	8.74	8.99	9.25	9.51	9.78	10.05	10.33	10.61	10.90	11.18	11.48
14	8.29	8.55	8.82	9.08	9.35	9.63	9.91	10.20	10.49	10.78	11.08
15	7.91	8.18	8.44	8.71	8.99	9.27	9.56	9.85	10.14	10.44	10.75
16	7.58	7.85	8.12	8.39	8.68	8.96	9.25	9.54	9.84	10.15	10.46
17	7.29	7.56	7.84	8.11	8.40	8.69	8.98	9.28	9.59	9.90	10.21
18	7.04	7.31	7.59	7.86	8.15	8.45	8.75	9.05	9.36	9.68	10.00
19	6.81	7.08	7.37	7.65	7.94	8.24	8.54	8.85	9.17	9.49	9.81
20	6.60	6.88	7.17	7.45	7.75	8.05	8.36	8.68	9.00	9.32	9.65
21	6.42	6.70	6.99	7.28	7.58	7.90	8.20	8.52	8.84	9.17	9.50
22	6.26	6.54	6.84	7.13	7.43	7.74	8.06	8.38	8.71	9.04	9.38
23	6.11	6.40	6.69	6.99	7.30	7.61	7.93	8.26	8.59	8.93	9.27
24	5.97	6.27	6.56	6.86	7.18	7.50	7.82	8.15	8.49	8.83	9.17
25	5.85	6.15	6.45	6.75	7.07	7.39	7.72	8.05	8.39	8.73	9.09
26	5.73	6.03	6.34	6.65	6.97	7.30	7.62	7.96	8.31	8.65	9.00
27	5.63	5.93	6.24	6.55	6.88	7.21	7.54	7.88	8.23	8.58	8.94
28	5.53	5.84	6.15	6.47	6.80	7.13	7.47	7.81	8.16	8.52	8.88
29	5.45	5.75	6.07	6.39	6.72	7.06	7.40	7.75	8.10	8.46	8.82
30	5.37	5.68	5.99	6.32	6.65	7.00	7.34	7.69	8.05	8.41	8.78

For example: If the interest rate of the mortgage is 5% and the period of amortization 20 years, the monthly amortization factor amounts to 6.60 per thousand.

Housing Market Analysis in Latin America

Department of State
Agency for International Development
Washington, D. C. 20523

Department of Housing and Urban Development
Division of International Affairs
Washington, D. C. 20410



PREFACE

This publication contains multiple copies of the ten worksheets described in an accompanying manual "Housing Market Analysis in Latin America." Using the methods discussed in the manual and the worksheets in this publication, readers will be able to develop housing market analyses in Latin American areas.

Copies of this workbook and of the manual can be obtained from the U. S. Agency for International Development Missions in the capital cities of foreign countries.

February 1965

Reprinted June 1966

Reprinted September 1968

Worksheet No. 2

ECONOMIC BASE ANALYSIS

AREA	COUNTRY	YEAR
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CHANGES IN EMPLOYMENT OR PRODUCTION

MAJOR SOURCES OF EMPLOYMENT OR PRODUCTION <i>(List industry or company. Identify unit of measure)</i> (1)	YEAR		CHANGE <i>(Column 3 minus column 2)</i>		ESTIMATED AVERAGE ANNUAL RATE OF CHANGE (6)	PROJECTED ANNUAL RATE OF CHANGE (7)
	<u> </u> (2)	<u> </u> (3)	NUMBER (4)	PERCENT (5)		

CHANGES IN GROSS NATIONAL PRODUCT

INDEX (1)	YEAR		CHANGE		ESTIMATED AVERAGE ANNUAL RATE OF CHANGE (6)	PROJECTED ANNUAL RATE OF CHANGE (7)
	<u> </u> (2)	<u> </u> (3)	NUMBER (4)	PERCENT (5)		

NOTE: Instructions for completing worksheet 2 are provided in chapter 3 of the Housing Market Analysis Manual.

Worksheet No. 2

ECONOMIC BASE ANALYSIS

AREA	COUNTRY	YEAR
------	---------	------

CHANGES IN EMPLOYMENT OR PRODUCTION

MAJOR SOURCES OF EMPLOYMENT OR PRODUCTION <i>(List industry or company. Identify unit of measure)</i>	YEAR		CHANGE <i>(Column 3 minus column 2)</i>		ESTIMATED AVERAGE ANNUAL RATE OF CHANGE	PROJECTED ANNUAL RATE OF CHANGE
	(2)	(3)	NUMBER (4)	PERCENT (5)		
(1)					(6)	(7)

CHANGES IN GROSS NATIONAL PRODUCT

INDEX	YEAR		CHANGE		ESTIMATED AVERAGE ANNUAL RATE OF CHANGE	PROJECTED ANNUAL RATE OF CHANGE
	(2)	(3)	NUMBER (4)	PERCENT (5)		
(1)					(6)	(7)

NOTE: Instructions for completing worksheet 2 are provided in chapter 3 of the Housing Market Analysis Manual.

Worksheet No. 4

ESTIMATED HOUSEHOLD FORMATIONS

AREA		COUNTRY		PERIOD
LINE NO.	YEAR (1)	POPULATION (2)	ESTIMATED SIZE OF HOUSEHOLD (3)	ESTIMATED NUMBER OF HOUSEHOLD* (4)
1	End of forecast period _____			
2	Beginning of forecast period _____			
3	Estimated new household formation during forecast period: Column 4, subtract line 2 from line 1.			_____ †

* Column 2 divided by column 3.

† Enter in worksheet 10, line 9.

INSTRUCTIONS FOR COMPLETING WORKSHEET NO. 4

Line 1 column 2: Enter the estimated population for the end of the forecast period based on available data, or estimated population as derived from worksheet 3.

Line 1 column 3: Enter estimated size of household.

Line 1 column 4: Compute estimated number of households by dividing column 2 by column 3.

Line 2 column 2: Enter estimated population for beginning of forecast period.

Line 2 column 3: Enter estimated household size.

Line 2 column 4: Compute estimated number of households by dividing column 2 by column 3.

Line 3 column 4: Subtract line 2 from line 1.

Worksheet No. 4

ESTIMATED HOUSEHOLD FORMATIONS

AREA		COUNTRY		PERIOD
LINE NO.	YEAR (1)	POPULATION (2)	ESTIMATED SIZE OF HOUSEHOLD (3)	ESTIMATED NUMBER OF HOUSEHOLD* (4)
1	End of forecast period _____			
2	Beginning of forecast period _____			
3	Estimated new household formation during forecast period: Column 4, subtract line 2 from line 1.			_____ †

* Column 2 divided by column 3.

† Enter in worksheet 10, line 9.

INSTRUCTIONS FOR COMPLETING WORKSHEET NO. 4

Line 1 column 2: Enter the estimated population for the end of the forecast period based on available data, or estimated population as derived from worksheet 3.

Line 1 column 3: Enter estimated size of household.

Line 1 column 4: Compute estimated number of households by dividing column 2 by column 3.

Line 2 column 2: Enter estimated population for beginning of forecast period.

Line 2 column 3: Enter estimated household size.

Line 2 column 4: Compute estimated number of households by dividing column 2 by column 3.

Line 3 column 4: Subtract line 2 from line 1.

Instructions for Completing Worksheet No. 7

OCCUPANCY AUTHORIZATION OR BUILDING PERMIT DATA

Column 1 – Enter names of all minor civil divisions in housing market area.

Column 2 – Add columns 3 through 6.

Columns 3 through 6 – Enter number of occupancy authorizations issued or number of building permits for houses actually completed or under construction over the past three years in each minor civil division. Do not include building permits that did not result in construction or counts of substandard housing units. Ordinarily building permit data are collected on a calendar year basis. For housing market analyses purposes, data should be adjusted up to month during which housing study is made. For example, if a study is completed in June 1964 then the building permit data should be adjusted to show a count of permits covering the three year period starting with July 1961 and ending with June 1964.

If building permit data covers an area larger than the housing market the statistics need to be adjusted to reflect construction solely within the area under study.

Instructions for Completing Worksheet No. 7

OCCUPANCY AUTHORIZATION OR BUILDING PERMIT DATA

Column 1 – Enter names of all minor civil divisions in housing market area.

Column 2 – Add columns 3 through 6.

Columns 3 through 6 – Enter number of occupancy authorizations issued or number of building permits for houses actually completed or under construction over the past three years in each minor civil division. Do not include building permits that did not result in construction or counts of substandard housing units. Ordinarily building permit data are collected on a calendar year basis. For housing market analyses purposes, data should be adjusted up to month during which housing study is made. For example, if a study is completed in June 1964 then the building permit data should be adjusted to show a count of permits covering the three year period starting with July 1961 and ending with June 1964.

If building permit data covers an area larger than the housing market the statistics need to be adjusted to reflect construction solely within the area under study.

Worksheet No. 8

ESTIMATE OF HOUSING DEMAND BACKLOG

AREA	COUNTRY	YEARS
------	---------	-------

Step I – Estimate of Household Formations During Past Three Years

LINE NO.	PERIOD	ESTIMATED POPULATION	ESTIMATED HOUSEHOLD	ESTIMATED NUMBER OF HOUSEHOLDS	ESTIMATED HOUSING DEMAND
	(1)	(2)	(3)	(4)	(5)
1	Current Year				
2	Current Year Less 3 Years				
3	Estimated Household Formations (Column 4, line 1 less line 2)				

Step II – Estimate of Dwelling Units Completed

LINE NO.	YEAR	ESTIMATED NUMBER OF UNITS COMPLETED
	(1)	(2)
4		
5		
6		
7	Total (Line 4 + line 5 + line 6)	

Step III – Estimate of Housing Demand Backlog

8	Total (Column 5, line 3 less line 7)
---	--------------------------------------

* Enter in worksheet 10, line 10.

Instructions for Completing Worksheet No. 8
ESTIMATE OF HOUSING DEMAND BACKLOG

Step I

- Column 1** – Enter the years covered by the backlog estimates in lines 1 and 2.
- Column 2** – Enter the estimated population for the years indicated in lines 1 and 2.
- Column 3** – Enter the estimated household size in lines 1 and 2.
- Column 4** – Divide the population in column 2 by the size of household in column 3 to obtain the estimated number of households.
- Column 5** – Column 4, line 1 less line 2 provides an estimate of the number of household formations during past three years.

Step II

- Column 1** – Enter years covered by backlog estimate in lines 4, 5, and 6.
- Column 2** – Enter number of dwelling units built in each year.
- Column 5** – Add column 2 and enter total in column 5, line 7.

Step III

- Column 5** – Subtract column 5, line 7 from line 3 to obtain the estimate of total housing demand backlog.

Worksheet No. 8

ESTIMATE OF HOUSING DEMAND BACKLOG

AREA	COUNTRY	YEARS
------	---------	-------

Step I - Estimate of Household Formations During Past Three Years

LINE NO.	PERIOD	ESTIMATED POPULATION	ESTIMATED HOUSEHOLD	ESTIMATED NUMBER OF HOUSEHOLDS	ESTIMATED HOUSING DEMAND
	(1)	(2)	(3)	(4)	(5)
1	Current Year				
2	Current Year Less 3 Years				
3	Estimated Household Formations (Column 4, line 1 less line 2)				

Step II - Estimate of Dwelling Units Completed

LINE NO.	YEAR	ESTIMATED NUMBER OF UNITS COMPLETED
	(1)	(2)
4		
5		
6		
7	Total (Line 4 + line 5 + line 6)	

Step III - Estimate of Housing Demand Backlog

8	Total (Column 5, line 3 less line 7)	
---	--------------------------------------	--

*

* Enter in worksheet 10, line 10.

Instructions for Completing Worksheet No. 8
ESTIMATE OF HOUSING DEMAND BACKLOG

Step I

- Column 1** – Enter the years covered by the backlog estimates in lines 1 and 2.
- Column 2** – Enter the estimated population for the years indicated in lines 1 and 2.
- Column 3** – Enter the estimated household size in lines 1 and 2.
- Column 4** – Divide the population in column 2 by the size of household in column 3 to obtain the estimated number of households.
- Column 5** – Column 4, line 1 less line 2 provides an estimate of the number of household formations during past three years.

Step II

- Column 1** – Enter years covered by backlog estimate in lines 4, 5, and 6.
- Column 2** – Enter number of dwelling units built in each year.
- Column 5** – Add column 2 and enter total in column 5, line 7.

Step III

- Column 5** – Subtract column 5, line 7 from line 3 to obtain the estimate of total housing demand backlog.

Worksheet No. 10

ESTIMATE OF EFFECTIVE DEMAND FOR HOUSING

AREA		COUNTRY					YEAR
LINE NO.	PRICE CLASSES (1)	CUMULATIVE PERCENTAGE (2)	PERCENTAGE BY CLASS INTERVALS (3)	ESTIMATED NUMBER OF FAMILIES ABLE TO AFFORD HOUSES (4)	ADJUSTMENT FACTOR FOR FAMILIES WITHOUT DOWNPAYMENT (5)	ESTIMATED NUMBER OF FAMILIES HAVING NECESSARY DOWNPAYMENT AND ABLE TO AFFORD HOUSES (6)	ESTIMATED NUMBER OF FAMILIES UNABLE TO AFFORD HOUSING IN THE PRIVATE MARKET (7)
1							
2							
3							
4							
5							
6							
7							
8	Total			*			

- 9. Total Family Formations (Enter from worksheet 4, line 3, column 4) _____
- 10. Plus Housing Demand (Enter from worksheet 8, line 8, column 5) _____
- 11. Total Housing Demand (Enter in line 8, column 4) * _____

NOTE: Instructions for completing worksheet 10 are provided in chapter 9 of the Housing Market Analysis Manual. Subtract vacancies from appropriate price class in column 6.

Worksheet No. 10

ESTIMATE OF EFFECTIVE DEMAND FOR HOUSING

AREA		COUNTRY					YEAR
LINE NO.	PRICE CLASSES (1)	CUMULATIVE PERCENTAGE (2)	PERCENTAGE BY CLASS INTERVALS (3)	ESTIMATED NUMBER OF FAMILIES ABLE TO AFFORD HOUSES (4)	ADJUSTMENT FACTOR FOR FAMILIES WITHOUT DOWNPAYMENT (5)	ESTIMATED NUMBER OF FAMILIES HAVING NECESSARY DOWNPAYMENT AND ABLE TO AFFORD HOUSES (6)	ESTIMATED NUMBER OF FAMILIES UNABLE TO AFFORD HOUSING IN THE PRIVATE MARKET (7)
1							
2							
3							
4							
5							
6							
7							
8	Total			*			

- 9. Total Family Formations (Enter from worksheet 4, line 3, column 4) _____
- 10. Plus Housing Demand (Enter from worksheet 8, line 8, column 5) _____
- 11. Total Housing Demand (Enter in line 8, column 4) * _____

NOTE: Instructions for completing worksheet 10 are provided in chapter 9 of the Housing Market Analysis Manual. Subtract vacancies from appropriate price class in column 6.

