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**MACRO STUDY ON HOUSING FINANCE:
DEMAND AND SUPPLY,
PROBLEMS AND SOLUTIONS**



Lanka Asia Management Systems Co. (Pvt.) Ltd
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Malwila Dissanayake (Corporate Monitor)
Manisha DeLanerolle (Coordinator)

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EXECUTIVE SUMMARY

In Sri Lanka, the problem of housing is related to low income levels, unequal income distributions, high population density in urban areas, high prices of building materials, lack of infrastructure facilities, and inadequate financing. However, in comparison to most other South Asian countries such as India, Bangladesh, Nepal, Pakistan, and Bhutan, and some of the other developing countries as well, the housing problem in Sri Lanka is not as acute.

Implementation of several housing programs such as the Hundred Thousand Housing Program (HTHP), One Million Houses Program (MHP) and the One Point Five Million Houses Program (OPFMHP) have resulted in improved housing services in Sri Lanka. Availability of finance, liberalization of trade, flexible government policies towards the development of housing and numerous incentive packages have contributed to the development of the housing sector. Housing construction has benefitted significantly through aid packages such as grants or loans from donor countries and non-government organizations.

Lack of housing and substandard housing are most common among the estate sector and among lower income groups in the rural and urban sectors. Substandard housing is the main problem facing these dwellers. While upgrading programs have to be accelerated in these three areas with government sector assistance or non-government agency support, recent improvement of housing in these areas seem to be effective.

The following study on housing in Sri Lanka indicate that as in other countries, housing demand in Sri Lanka is determined by population growth (family formulation), population density, per capita income, ownership of dwelling, cost of construction and finance availability. The results of the multiple regression model show that the most significant factors which determine housing demand are population density, family formation and the cost of construction.

The forecast on housing demand between 1992-2003, based on an estimated increase in households (family formation), replacement of old housing stock, improvement of housing conditions and various government policies regarding the housing, agricultural and industrial sectors, reveal that housing needs between 1992 to 2003 will range from 144,864 to 167,888. The highest demand is in the rural sector, 83,300 to 103,700, and least in the estate sector 9,500 to 25,000. The urban sector requirements vary between 52,000 to 54,000 during the forecasting period. The number of new units required during the 1992-2003 period will decline from 54,000 to 52,000. Approximately 39,000 to 55,000 units per year are scheduled to be replaced. Annually, 51,864 to 60,888 units will have to be upgraded during 1992-2003.

In addition to housing demand, the study forecasts the housing supply situation during the same period. According to survey reports, housing stock in 1981 was at 2.8 million while in 1992 it stood at 3.1 million. However, private sector contribution

to the total housing construction increased from 45 percent in 1986 to 60 percent in 1991. Details are given in Table 7 and 8. The housing supply between 1992 and 2003 is estimated at 141,074 and 168,301 units. The total private sector contribution during the same period ranges between 87,644 and 104,573.

The core problem in the housing sector is related to the gap between the housing demand and the supply. Comparatively, the gap between housing demand and supply will decline from 3,790 in 1992 to approximately zero by 2003. Heavy construction programs under the One Point Five Million Houses Program, financial availability under USAID program, greater emphasis given by the Government for housing development programs and the increased amount of employment opportunities in the Middle East countries will be contributing factors for the decline. Pressure on urban sector too is expected to decline as a result of new industrial policy together with agricultural development. Yet, the problem of housing affordability for Janasaviya beneficiaries and food stamp holders may continue if the Government does not take appropriate measures to solve the problem of the poor. Hence, it is advisable to initiate grant programs for housing, or housing support programs to overcome housing problem amongst the poor in rural and urban slum and shanty areas.

The evaluation of loan recovery rates of the housing finance institutions indicate that in Sri Lanka the recovery rates are satisfactory. Average recovery rates range between 70-85 percent as most of the housing loans are granted with mortgages and high quality collateral. Fixed income earners such as government, bank and private sector employees are given preference over others. The highest recovery rates are with TCCs Co., Rural Banks, and Commercial Banks. However, the recovery rate of the National and Housing Development Authority (NHDA) is very low because of loan payment exemptions granted to Janasaviya beneficiaries. Hence it is necessary to take appropriate measures to avoid this type of distortions.

Market distortion as a result of rent and price control will affect the growth and development of the housing sector unless steps are taken to reduce government intervention to a bare minimum in order to ensure an appropriate supply of housing. The laws governing rent control need to be revised in order to safeguard both occupants as well as the housing investors. Revision of rent according to the inflation rate is a necessity for the development of the housing industry. Simultaneously, rent component of the salaries and wages of employees have to be adjusted in keeping with the current rates.

In addition to laws on rent control, all laws relating to building approvals have to be re-considered in view of present environmental conditions. So far, high value land within the city has been inefficiently utilized by allowing the construction of individual housing units. Because of the increasing scarcity of developable land in Sri Lanka, high rise apartment complexes need to be substituted for individual housing units. These programs need to be initiated by the Government with the help of private sector. Home owners need to be given attractive incentives to buy apartments instead of housing units. Initially,

they can be given the opportunity to occupy these apartments at low rent and later these rents should be gradually brought upto the market levels.

CHAPTER 1

INTRODUCTION

As in many developing countries, the problem of housing in Sri Lanka is associated with low income level, unequal income distribution, high population density in urban areas, lack of infrastructure facilities and inadequate shelter. Rapid increase in population, high rate of urbanization (21 percent)⁽¹⁾ and inadequate resources for housing development have aggravated the situation. In 1991, the population of Sri Lanka was estimated at 17.2 million comprising of 3.4 million households⁽²⁾. The occupied housing stock totalled 3.1 million units suggesting a 9.7 percent over crowding⁽³⁾.

The purpose of the study is to review recent trends in the housing sector using demand and supply analysis. Specifically, the estimation of housing investment as a percentage of the Gross Domestic Product (1988-1991), public sector expenditure on housing as a percentage of total Government Expenditure, housing sector investment by the public and private sectors, and estimation of public and private sector recovery rates of housing loans.

The study comprises of five major sections. First, the dimension of the housing problem is discussed, taking certain housing indicators of Sri Lanka and other developing countries into consideration. Second, the historical development of housing construction in Sri Lanka is reviewed, by examining major public sector programs. Third, the demand for housing in context of the current economic environment, is analyzed using a multiple regression model. A forecast has been done for a ten year period on required number of new units and upgrading and replacement needs. The last two sections examine housing supply and related problems.

CHAPTER 2

DIMENSION OF THE HOUSING PROBLEM IN SRI LANKA

The housing requirement cannot be assessed in isolation, but has to be considered in line with inadequate living space, sub-standard accommodation, high household density, and lack of basic facilities. Evidence suggests that most developing countries are faced with similar housing deficiencies.

Empirical examinations, indicate (Gilbert 1988) that in terms of an index of service provision or household density, the living conditions of the majority of the urban population in less developed countries, are unacceptable when compared to that of most European or North American countries. Statistics reveal that in Bombay, India, 77 percent of the households with an average of 5.3 persons live in single rooms while many others are forced to find make-shift sleeping accommodation on sidewalks at night. In Ghana, room density ranges from 2.5 to 3.2 in the cities of Takodi and Acra⁽⁴⁾, while in Colombo room density consists of 1.8 person on average⁽⁵⁾. Other indicators, as shown in Table 1, confirm that the majority of low income dwellers in Sri Lanka do not have access to basic facilities such as latrines, drinking water, and electricity. The households with latrine facilities have markedly decreased by 3 percent in 1982 when compared with 1979. A substantial proportion of households do not have access to pipe-borne water in the house. In 1982, only 6.5 percent of the total households in Sri Lanka had pipe-borne water while in 1988 the total increased to 7.7 percent and to 10 percent in 1991. Although the majority of urban households, 59.6 percent, have electricity, a fair number use kerosene for lighting⁽⁶⁾.

In Sri Lanka, 75 percent of the population comprise of rural households while the rest are in urban and estate sectors⁽⁷⁾. In all three sectors, substantial shelter requirements exist, most urgent being water and sanitary needs. At present, most rural houses have less than 3 rooms and are occupied by 5 persons on an average. These houses usually have rammed or mud earth floors, daub walls and palm thatch roofs. Consumable water is drawn from protected wells and average households have pit latrines. In many households kerosene is used for lighting while cooking is done with firewood. However, the condition of more than one third of rural households is comparatively worse. They lack sanitary facilities, are forced to draw water from streams or other catchments and are confined to one or two rooms structures.

In comparison, urban dwellers in Sri Lanka face even greater problems than those in the rural sector. More than 50 percent of Greater Colombo residents live in slums or shanties. These dwelling units consist primarily of row houses, where in each unit, more than one family may occupy a single room, lack either running water or sanitary facilities. A substantial proportion of these units are very small. According to the Consumer Finance and Socio-Economic Survey 1986/87, the room density in Colombo is 1.8, the average floor area per person is 10 square meters.

Yet, 15% of the households have floor areas of less than 100 square feet. The average household size among the slum dwellers who occupy these sub-standard urban housing units consist of 7 members⁽⁸⁾.

CHAPTER 3

REVIEW OF THE HISTORICAL DEVELOPMENT OF HOUSING POLICIES AND PROGRAMS - A SUMMARY

Since independence, successive governments of Sri Lanka have implemented several programs aimed at alleviating the standard of living of the population. During the past 10 years, the development of the housing sector has taken precedence over the other projects. While in the two decades of post-independent era in Sri Lanka, the development planners did not pay much attention to construction activities especially in the housing sector, during the period 1970-77 the government in power was directly involved with housing construction activities. However, the government was able to construct only about 4000, high cost and highly subsidised apartments in urban areas during this period, with minor housing activities in the rural sector. Legislation enacted at this time, confiscating 'excess' rental property, adversely affected private sector involvement in housing investment and development. With economic policy changes in 1977, the government paid special emphasis to housing development, and the urban development program gained importance as one of the three leading development projects. Housing was considered an 'engine of development' which would help solve the employment problem, and stimulate economic development in the country as a whole⁽⁹⁾. The policy makers of the government were highly optimistic about both the public sector and private sector involvement in housing development activities.

Considering the past performance of both private and public sector involvement in construction activities since 1979, three major programs have been identified. The first being the 'Hundred Thousand Houses Programme' (HTHP), implemented during the period 1978 to 1983 and the second, the 'Million Houses Program' (MHP) in the period 1984-89. The third ambitious program which is the 'One Point Five Million Houses Program' (OPFMHP), is currently in progress⁽¹⁰⁾. The performance of these program are examined in the following sections by taking into consideration the resource allocation for each program and the total output.

In order to achieve program targets, two new organizations, namely, the Urban Development Authority (UDA) which is responsible for Colombo metropolitan planning, and the National Housing Development Authority (NHDA) which is responsible for implementing housing programs in general, were established. The NHDA was established in 1979 basically to implement and promote government housing policies. It is expected to engage directly in the construction of housing, formulation of housing development schemes, development of slums and shanty areas, land development activities, provision of financial or other assistance, and co-ordination and carrying out housing development activities. The NHDA initiated a number of new programs aimed at developing the rural sector which were collectively referred to as Rural Housing Sub-Program (RHSP) under the 'Hundred Thousand Houses Program'.

3.1 Hundred Thousand Housing Program (HTHO) - 1978-83

Originally this program included several housing and construction projects. The resource base for this program was strengthened by foreign assistance from donor countries. USAID pledged US\$ 100 million under the Housing Guarantee Program and released US\$ 25 million under Phase I for technical training. This guarantee covered the financing of eligible shelter and infrastructure facilities. The following programs were funded under this aid program:

1. Aided Self-Help Program
2. The Model Village Program
3. Electoral Houses Program; and
4. Fishermen's Housing Program.

In the meantime, the UDA engaged in the slums and shanty upgrading program.

3.1.1 Aided Self-Help Program

The Aided Self-help Program is a subsector of the 'Hundred Thousand Housing Program'. It aimed at completing 50,000 houses through the combined effort of both the NHDA and the beneficiary families. The NHDA provided the information, management guidance, house plan, building materials, and land for the project, while the beneficiary families provided the labour component. Under this program, low income families (monthly income below US\$ 12.560-27) were eligible to receive benefits. The two major problems encountered during project implementation were the shortages of building materials and the failure of some selected beneficiaries to commence their work.

In general, the program proved to be cost effective, and within the capabilities of NHDA and the beneficiaries. By the end of 1983, approximately 6950 housing units distributed among all districts of the country were completed.

3.1.2 Model Villages (MV)

This program emphasized the development of community centres, clinics, wells, schools and roads while houses proper were built through self-help programs. The infrastructure facilities of the MVs were usually developed by the contractors. However, the other aspects such as loan applications and necessary improvements were required to be made at grass root level by the local council or Gramodaya Mandalaya. By the end of 1983, approximately 7086 units were completed.

3.1.3 Electoral Houses (EH)

The EH program was commenced by the government in 1978, in which a specified number of houses were constructed in each parliamentary electorate. The EH model houses were slightly bigger than the ASH and MV models and therefore, the beneficiaries of EH units were from higher income families. The total number of units completed under the scheme upto 1983 was 3880.

3.1.4 Fishermen's Housing (FH)

The FH program was a joint project between the NHDA and the Ministry of Fisheries. The NHDA considered this program to be outside the main stream of their main activities and therefore, terminated their arrangement with the Ministry of Fisheries in 1982. Under this category only 568 units were completed.

3.1.5 Slums and Shanty Upgrading Program (SSUP)

SSUP division of the Urban Development Authority commenced its operations in late 1979 and functioned until 1985. Since then, that division is attached to NHDA. During SSUP's operations it was able to upgrade about 10,000 houses, mainly located within the Colombo City limits. The capital cost for these improvements were absorbed by the UDA. Beneficiaries were levied a normal user charge.

Although the Hundred Thousand Houses Program (HTHP) was expected to be completed during 1978-83, the program continued for a few more years till the realization of the targeted number of houses (Table 2). The total number of housing units completed at the end of 1986 was 82,696 while the expenditure on these had been Rs.4493.5 million.

3.2 Million Houses Program (MHP)

The MHP was aimed at solving the twin problem of shelter and poverty simultaneously at village and provincial levels. This program which covered rural, urban and plantation sectors continued to provide basic shelter to target groups. Generation of employment opportunities and income was also envisaged through this program. The program provides basic and appropriate shelter to the needy by way of loans and grants for constructing houses, upgrading existing houses and improving shelter conditions through a wider package of options. However, final aim of the program is to alleviate poverty among all sections of the population.

The MHP allowed the beneficiaries the discretion of building a house of their own choice. The village re-awakening concept was instilled in the people, the main features of which are "people's strength to build houses through their creativity, self-reliance and community participation"⁽¹¹⁾. This program has taken the form of model villages, re-awakened villages and urban housing projects, in its process of implementation. These schemes are provided with all basic amenities such as roads, water, electricity and health care services.

The MHP was a radical departure from the previous programs where the main thrust was on public sector involvement. Instead it focused on both public and private sector participation. The theme of the MHP was 'minimum intervention, maximum support by the state and maximum involvement of builder families'⁽¹²⁾. The goal was to reach a far greater number than before at a lesser cost to the nation with the state playing only a supporting and motivating role⁽¹³⁾.

The MHP consists of several sub sector programs as given below. The main objective was to cater to a wide spectrum of needs of different sectors of the economy:

1. Rural Housing Sub Program (RHSP)
2. Urban Housing Sub Program (UHSP)
3. Private Sector Formal Housing Sub Program (PSFHSP)
4. Private Sector Informal Housing Sub Program (PSIHSP)
5. Plantation Housing Sub Program (PHSP)
6. Mahaweli Settlement Housing Sub Program (MSHSP)
7. Major Settlement Scheme Housing Sub Program (MSSHSP).

In January 1984, the RHSP, the first component of the MHP, commenced operations throughout the country. Under this program, individuals were provided with small loans (\$120-300) depending upon the activities, such as new construction, rehabilitation, provisions of latrines and wells etc. The eligibility criterion was monthly household income of less than Rs.1000. The duration of loans ranged from 5 to 15 years and 3 percent interest rate for loans below \$200 and 6 percent for those loans above \$200. The small housing loans provided under the RHSP are expected to mobilise private resources and skills. In the first year itself, the program was extensive and was able to provide 43,000 loans, which is a much higher number than that of the entire 6 years of the HTHP. The total amount spent on this scheme was US\$ 13 million. At the end of 1986 the number of beneficiary families amounted to 97,020. A total of 196,570 persons were granted loans under RHSP during 1984-91.

Although the expected target of the RHSP for 1984-89 was 300,627, the number of units completed during the same period was only 195,085. The actual expenditure in respect to the above was Rs.1325.8 million. The rest of the program was completed after 1989.

3.2.1 Urban Housing Sub Program (UHSP)

The Urban Housing Sub Program (UHSP) is mainly concerned with (a) improvement of site and services and (b) upgrading of slums and shanties. This program commenced its operations in 1985 while the main program was initiated in 1984. The UHSP covered 13 municipal councils and 38 urban council areas in Sri Lanka. The beneficiaries of both these programs were low income families. As shown in Table 3, a total of 227,240 housing units was completed during the period 1984-1991. The total expenditure incurred for the above two programs was Rs.1708.2 million (Table 4).

3.2.2 The Plantation Housing Sub Program (PHSP)

This program was aided by the Medium Term Investment Program (MTIP) and the Norwegian-Dutch program. It was implemented by the Janatha Estates Development Board (JEDB) and the Sri Lanka State Plantations Corporation (SLSPC). Construction and rehabilitation of houses were undertaken from 1984 to 1989. In addition, a total of 2713 houses were provided with water and sanitation facilities. Health and child care centres were established during the MHP program (Table 4).

3.2.3 Mahaweli and Major Settlement Scheme Housing Sub Program (MSSHSP)

Under this program, settlers were provided with loans of Rs.12,000 per family and roofing materials. The program was funded by the European Economic Community and the Land Commissioner's Department. The Land Commissioner's Department provided grants to build houses in the major settlement areas. The main aim was to improve housing facilities. A total of 10,014 houses were built in the Mahaweli and major settlement areas. Total expenditure incurred on this program amounted to Rs.120 million during 1984-1989.

3.2.4 Private Sector Housing Sub Program (PSHSP)

The purpose of PSHSP was to provide financial support to individuals through financial institutions such as the State Mortgage and Investment Bank (SMIB), Housing Development Finance Corporation Ltd. (HDFC), National Savings Bank (NSB), Commercial Banks including People's Bank and the Bank of Ceylon, Co-operative Rural Banks (CORB) and Thrift and Credit Co-operative Societies (TCCS). The details with regard to amount of loans granted are given in Table 4(a). The Private Sector Formal Housing Sub Program (PSFHSP) was conducted through Real Estate developers. Details on housing construction, loans granted, and land sales

are not available, as these developers maintain confidentiality over records. Reliability of the available data cannot be determined without a comprehensive survey.

Private sector investment on housing can be classified according to the sources of funding as well. According to this classification, loans under Co-operative Rural Banks and Thrift and Credit Co-operatives contribute very little to private sector investment. A large amount of funds are provided by individuals from their savings, income earned from Middle East employment and other investment sources. Since these figures are residuals and there are unusual variations in these figures (Table 4(a) and (b)), estimations are based on savings figures noted in the Consumer Finance and Socio-Economic Survey 1986-87.

3.3 One Point Five Million Housing Program (OPFMHP)

The One Point Five Million Housing Program came into effect in 1990 after the completion of the One Million Houses Program which stretched over the period 1984-1989. The OPFMHP was formulated on the basis of experience gained from the previous major programs - the Hundred Thousand Housing Program and the One Million Housing Program. The main objective was to assist 1.5 million families by providing loans and grants to construct and upgrade houses and to improve shelter conditions of the poor. The expected time frame is 6 years commencing in 1990⁽¹⁴⁾. Table 4 gives details of the program.

In 1990, housing activities under the OPFMHP were adversely affected by several factors such as financial constraints experienced by the relevant housing finance institutions, escalation of civil disturbances in the Northern and Eastern Provinces during the latter half of the year and scarcity of building materials. However, the NHDA has taken several measures to facilitate the implementation of the OPFMHP in 1990. The Housing Development Finance Contributory Projects were initiated to mobilize funds from the decentralized budgets of Provincial Councils and Integrated Rural Development Programs (IRDPs). The total allocation committed was Rs.68 million and Rs.49 million respectively in 1990. Meanwhile, organizations such as Housing Development Co-operative Societies (HDCS) were established to smoothen the operation of the OPFMHP at community level. It was also proposed to expand the HDCS network throughout the community by establishing them in each Pradeshiya Sabha division. Further, Resource Development Projects launched with twin objectives of producing low cost building materials and generating income opportunities with optimal utilization of local resources. In addition, efforts have been taken under the sponsorship of various other organizations such as the police, temples, schools, Seva Vanitha Movement, and NGOs, to mobilize more contributors towards the implementation of the OPFMHP⁽¹⁵⁾.

As in the other previous housing development programs, OPFMHP consists of 11 sub programs, namely the Rural Housing Sub Program (RHSP), Urban Housing Sub Program (UHSP), Disaster Housing Sub Program (DHSP), Provincial Council Housing Sub Program (PCHSP), Mahaweli Housing Sub Program (MHSP), Employees Housing Sub Program (EHSP), Individual Family Housing Sub Program (IFHSP), Private Developer Housing Sub Program (PDHSP) and Building Resources Development Sub Program (BRDSP).

Of these, the most important programs are RHSP and UHSP. These programs envisage providing housing facilities to 450,000 and 250,000 families respectively by the end of 1995. The National Housing Development Authority (NHDA) was assigned the responsibility of implementing the above two programs. Under RHSP, a total of 58,267 families were granted loans with a maximum of Rs. 12,500 per family. However, the housing units completed during the corresponding period were 39,844 at a cost of Rs.444.57 million by the end of 1991 (Table 4).

Under the Urban Housing Sub Program (UHSP), a total of 10,143 low income families were granted credit facilities for the improvement of houses and a further sum of Rs.82.88 million was disbursed among 8231 loan recipients to complete their houses by the end of 1991.

Meanwhile, under the Provincial Council Housing Sub Program (PCHSP), housing loans amounting to Rs.13.88 million were provided to 2492 families by the end of 1991. In addition, a total sum of Rs.158.88 million was disbursed among 4165 families who were affected with natural or man-made disasters during the same period.

The Plantation Housing Sub Program (PHSP) mobilised resources under the social welfare program of the Medium Tank Investment Program (MTIP) funded by the Asian Development Bank (ADB) and the Dutch and Norwegian Governments. This program was implemented by Sri Lanka State Plantation Corporation (SLSPC) and the Janatha Estates Development Board (JEDB) as in the MHP. A total of 325 new houses and 564 upgrading were completed by SLSPC and JEDB at the end of 1991. Meanwhile both JEDB and SLSPC supplied latrine facilities to 13,462 housing units during the same period.

The Private Sector Housing Sub Program (PSHSP) was implemented by the major banking and financial institutions through their loan schemes. The State Mortgage & Investment Bank (SMIB), National Savings Bank (NSB), Housing Development Finance Corporation Ltd (HDFC), Bank of Ceylon and People's Bank are the major state owned financial institutions which extended financial facilities for private sector housing development activities under OPFMHP. Details are given in Table 4.

The other method of allocating funds for public and private sector involvement in housing is given in Table 4(b).

Accordingly, private sector support includes CORB, TCCs and other individual funds only. Rest of the funds are for public sector housing. Details are given in the Table 4(b).

3.4 Investment on Housing in Sri Lanka

As in other developing countries, investment on housing contributes approximately 5 percent to the Gross Domestic Product although Sri Lanka's investment on housing ranged between 4.9 and 2.7 percent during the period 1986-1991. This indicates that housing investment in Sri Lanka is becoming expensive as the cost of building materials and the price of land escalate rapidly. This trend was partly offset by the availability of funds under Government sector housing programs such as the One Million Houses Program (MHP) and the One Point Five Million Houses Program (OPFMHP).

According to the Consumer Finance and Socio-Economic Survey in 1986/87, about 5 percent of the GDP was invested in housing in Sri Lanka⁽¹⁶⁾. On this basis, total investment on houses is estimated in this report. However, these figures have been adjusted in order to incorporate development activities in Sri Lanka during 1986-1991. Factors such as civil disturbances during 1983-1991, trends in the housing sector, public sector housing programs, cost of land and of building materials, and inflation rates are taken into consideration.

According to Table 4(b) the total investment in 1986 was Rs. 7986.7 million which increased to Rs.9215.7 million in 1991, an increase of 15 percent. Of the totals nearly 16 to 23 percent of the investments are funded by public sector institutions. The balance funds were from individuals (Table 4(b)).

CHAPTER 4

DEMAND FOR HOUSING IN SRI LANKA

The demand for housing services can be assessed according to quantitative and qualitative aspects. Quantitatively, aspects such as the number, and size of houses are considered, while qualitatively, architectural style, design, and tenure are considered. Quantity is difficult to assess in the case of housing because individuals often express their preferences for different houses in terms of size -large, moderate and small. In order to measure these preferences objectively, one must combine various attributes and assess the implicit valuation of these, across a wide range of housing types. Furthermore, the demand for housing services in Sri Lanka is quite different from the attributes seen in the developed countries. Generally, it has been assumed that markets are capable of resolving these issues in terms of a single price for the house which then be used as a weighted generalised measure of quantity and quality. There has been considerable debate in the housing literature over the years about the value of the income elasticity demand for housing. Most studies have suggested that the short run income elasticity of demand for housing is based on current income of household and was typically less than unity⁽¹⁾. However, such a low value would not explain the growth in housing demand as it happened in Sri Lanka during the past few years. As such permanent income long run elasticity should be used assessing housing demand. Price elasticity of demand is also rather low for housing, suggesting that there is very little variation in housing consumption which can be induced by marginal prices.

4.1 Housing Market

When looking at the housing market one cannot regard housing as a homogeneous commodity or a single activity. Houses themselves are of many different types; in terms of their size and occupant preferences. The most important characteristics are :

- a) Income; and
- b) the city structure.

Studies indicate that (according to CFS Survey CB) the rich seek new and more spacious areas on the fringe of the developed areas while the poor are confined to densely built inner city areas. This shows that paradoxically, the poor tend to live on the highest valued land with best accessibility, because they lack private transport.

During the past few years, housing development activities have been constrained due to political, economic and social factors discussed in Chapter 3. In addition, price trends of past months indicate that the cost of construction material, mainly cement, have increased considerably due to the accelerated development of the proposed 200 garment

factory projects. On the other hand, one cannot neglect the possible drawback linkages, that can have impact on aggregate demand.

The above facts clearly indicate that housing demand is associated with a number of economic and social factors, and that it can vary from one sector to another (urban, rural, estate). However, an attempt is made to identify the important factors that can directly affect housing demand. Several models are tested to identify the important explanatory variables in housing demand which would be of importance to the subsequent analysis.

4.2 Model

It is hypothesized that the housing demand (or increase in the number of households) is a function of population density, per capita income, ownership dwellings and cost of construction materials. Simple linear models were specified from annual data obtained for the years 1975 to 1991. Separate demand functions were specified since factors affecting demand are not common (Annex I).

The four models specified were as follows:

$$\begin{aligned}D_{H1} &= f(Pd, Cocon, Owd, PcGDP) \\D_{H2} &= f(Pd, Cocon, PcGDP) \\D_{H3} &= f(Pd, Cocon, Owd_1, PcGDP) \\D_{H4} &= f(Pd, Cocon, Owd, Owd_1, PcGDP)\end{aligned}$$

where

DH = Demand for housing (increase No. of households)
Pd = Population density
Cocon=Cost of construction materials
Owd = Ownership dwelling in sq. term which considered
as increasing value of housing rent
PcGDP=Per capita income.

Construction materials are not homogeneous and can vary depending on the size of the house and the intended use. Hence, the cost of construction index was used and an average of this index was calculated from years 1975 to 1980 since there was no constant data set. Data were obtained from the secondary sources, such as the Central Bank Annual Reports, NHDA. Consumer Finance and Socio Economic Survey, Commercial Banks and Registrar General's office.

4.3 Results of the Multiple Regression

The total number of households per annum was regressed against population density, cost of construction materials, ownership dwellings and per capita income. Data from 1975

to 1991 were used since information prior to 1975 was not available.

$$DH_1 = -2098c + 26pd + 0.41 - 0.0060wd - 0.2243$$

(771.5) (5.48) (0.56) (0.039) (0.10)

$$R^2 = 0.98 \text{ Adjusted } R^2 = 0.98$$

D.W Statistics 1.59
F Statistics = 197.37

The total demand per annum regressed against population density, cost of construction, ownership dwellings and per capita income gives unexpected negative signs. However, for ownership dwellings, it is small and not significantly different from zero. This suggests that increase in the per capita income on its own demand for housing has little impact, and other explanatory factors such as population density and cost of construction show significant impact on demand.

$$D_{H2} = (Pd, Cocon, PcGDP)$$

The above model concerns only three variables. Restriction is made to ownership dwellings and results were:

$$R^2 = 0.98 \text{ adjusted } R^2 = 0.98$$

In this model per capita income is significant, suggesting that when there is an increase in per capita income there is a related increase in housing demand.

$$D_{H3} = F (Pd, Cocon, Owd_2, PcGDP)$$

The model concerns ownership dwelling in quadratic form, assuming that housing rent is not linear. The results were positive suggesting that increase in rent will have a significant impact on housing demand.

$$DH_4 = f(Pd, Cocon, Owd, Owd_2, PcGDP, PcGDP_2)$$

The model concerns both ownership dwelling and per capita income as dominant factors. Two variables, housing rent and per capita income were considered in terms of linear and quadratic. Results were acceptable to the model and R^2 was 0.99. This implies that per capita and housing rent were insignificant only upto a certain level of income. If it increases as assumed, then there is a positive relationship with housing demand. Therefore, the model explains that as a result of higher per capita income and housing rate, the demand for housing will increase. On the basis of the results, a demand forecast for the years from 1992 to 2003 is created.

CHAPTER 5

HOUSING DEMAND FORECAST BETWEEN 1992 - 2003

The following sections consider the number of houses required to accommodate increases in the number of households (new units required), to cover losses from the existing stock (replacements), to improve the quality of houses and to reduce crowding to acceptable levels.

5.1 Accommodation of Population Growths

As in other developing countries Sri Lanka's population growth is expected to increase rapidly during the next two decades^[13]. The demand for housing increases simultaneously to accommodate the population growth.

Population growth in Sri Lanka has been moderate when compared with other developing countries. Between 1970 to 1992, its population registered a growth rate of 1.6 to 1.7 percent per year but in the latter years, the growth rate was only 1.1 to 1.3 per cent per year (Table 5). This is the lowest growth rate among all developing nations of comparative income groups.

For this study, population growth during 1992 to 2003 is estimated at 1.3 per cent per year for 1992 - 1995, 1.2 per cent per year for 1995-1998 and 1.1 percent for the period 2000 - 2003. The results of these projections appear in Table 5(a). Table 5(a) shows the increases in population growth and the corresponding increase in the number of households during 1992 to 2003. Furthermore, sector-wise population growth and the number of households are also given in Table 5(a). This data has been utilized to estimate the new housing units required during 1992 to 2003. The population growth data, together with net migration from rural and estate sectors to urban sector, (urbanization) new industrial and agricultural policies and decline in family size have been considered in estimating housing needs for all island and sectoral needs of Sri Lanka. The results of these computations are shown in Table 6(a) and (b).

5.2 Replacements of the Existing Housing Stock

The second component of the housing needs arises from the need to replace units removed from existing stocks. In estimating the future replacements, longevity of houses and quality improvements have been considered. Industrial development, net incomes from Middle East employments are also considered in estimating replacements of sectoral housing needs of the country. The actual rate of physical depreciation in housing is one of the more elusive

statistics in all countries, and Sri Lanka is no exception. There are replacements from all sources ranging from obsolescence and natural disasters to man-made disasters. The details are in the Tables 6(a) and (b).

5.3 Upgrading to Minimum Basic Standards

As shown earlier, a substantial share of the population in Sri Lanka lives in houses below the minimum acceptable quality level. This was particularly true for the estate sector, rural sector and the shanty and squatter houses in the urban areas. Housing strategies typically give specific attention to the financial requirements arising from population. In this regard "shelter for all in 2000" cannot be ignored in estimating the upgrading. Moreover, further aspects have been considered when estimating the future requirements of upgrading. Improvised structures, supply of essential amenities such as pipe-borne water, sanitary facilities and electricity and replacements of slums and shanties are the factors that affect upgrading requirements of housing units in the future. Over crowding is the other most important factor that affects development of housing needs in Sri Lanka. The sectoral details are given in Table 6(a) and (b). Essentially, these estimates are on the basis of "shelter for all by 2000" but not on the basis of water and electricity for all by 2000".

On the above basis, the housing demand in Sri Lanka has been estimated. The results are given in Table 6. Accordingly, the number of new units required during 1992 to 2003 ranges from 54,000 (in 1992) to 52,000 in 2003. In addition, 39,000 to 55,000 housing units per year are scheduled to be replaced. Around 51,864 to 60,888 units per year have to be upgraded during 1992 to 2003. These upgrading are mostly due to old age of housing stock. Combined total of all three categories will give the housing demand per year. In general, these estimates of the number of housing units needed in future are somewhat lower than other recently completed studies. The principal reasons for the differences are (a) these estimates employ more recent population projections adjusted for recent changes in the demographic pattern which show lower growth than those previously available data (b) differences in assumption about replacements and upgrading. In general, these estimates imply a level of constructions which is well within the range of the ability of the economy, judging from the production levels, prices of building materials, financial resources available and the new population growth trends.

CHAPTER 6

SUPPLY OF HOUSING IN SRI LANKA

According to the Registrar General, population in 1992 is estimated at 17.2 million while the number of households in Sri Lanka are to be at 3.4 million. In the 1981 census of population, the corresponding population and the number of households were 14.8 million and 3.1 million respectively. The occupied housing stock was totalled at 2.8 million units in 1981. On the same basis, total housing stock in 1992 can be estimated at 3.06 million and when his figure is adjusted for current trends, housing stock at the end of 1992 can be estimated at 3.128 million units and shows that overcrowding has been declined to 3 per cent as compared to 10 percent in 1981.

The 1981 census of population, estimated urbanization was at 18 per cent and the figure has now increased to 21 percent according to the latest information (1986/87 Socio-Economic and Consumer Finance Survey). Furthermore, the conditions of country's housing stock can be also assessed in terms of size of the dwelling; tenure of dwelling and the material used for housing construction over the last decade.

In recent years, housing construction in Sri Lanka improved to a satisfactory level. As a result, the three and four- roomed houses was the most common feature and together accounted for more than 40 per cent of the total housing stock in 1986/87. Thirty five per cent of the houses had five rooms or more. About 83 per cent of the houses were owner occupied while rented houses accounted for 6 percent in 1986/87. Information on quality of construction materials used suggest that houses with brick walls accounted for 35 percent while nearly 60 percent of houses had cemented floors. The houses with tiled roofs accounted for 35 percent and 9 percent had asbestos roofing. But in 1981 only about 40 percent was rated as "permanent" and less than 10 percent was classified as "improvised".⁽²⁰⁾ The latter rate has been considerably reduced due to expansion in housing programs after 1978 (Table 4(a) and (b)).

In addition, common amenities such as safe water supplies, sanitary and waste disposal have improved much faster than other facilities. Pipe-borne water within premises and piped-water outside premises during 1981 were at 6 percent and 9 percent respectively. The corresponding figures during 1986/87 improved to 8 percent and 15 percent respectively. According to 1986/87 data, water was available with 69 percent of the households and almost 83 percent of households were equipped with latrine facilities of some sort as compared to 7 percent and 65 percent respectively in 1981. On the other hand, much of the improved amenities were seen in the urban sector. Furthermore, access to electricity has been improved very rapidly during the latter period than in 1981. Around 29 percent of the households were reported to have access to electricity in 1990 as compared to 25 percent in 1986/87 and 15 percent in 1981. 64 percent in urban sector enjoyed this facility as compared to only 18 percent in the rural sector in 1986/87.

6.1 Public and Private Sector Contribution in Housing Construction

The above is an overall picture of housing conditions in Sri Lanka during 1981 to 1991. It is also necessary to focus attention on year to year dynamism in the public and private sector construction on housing. These trends provide essential background for judging the capacity of the country to produce the number of units needed in the future. Table 7 gives the details of the housing development programs which were implemented by the Sri Lanka Government from 1979 to 1991.

Table 7 indicates that there has been a low level of expansion in the number of units constructed annually of permanent nature and the provisions of housing amenities under different housing development programs. The overall level in 1991 showed only a marginal decline over 1986. This indicates a growing current capacity of the residential construction is in the private sector. Table 8 further gives the details of expansion of the private sector housing construction industry from 1986. The other important factor in this table is the acceleration of the private sector share in housing construction industry. According to available data, private sector share in the housing market shows a continuous upward trend and an increase to 60 percent from 44 percent in 1986. Hence, one could safely argue that housing activities in Sri Lanka were primarily funded by the private demand. This degree of private sector activity is especially impressive in the light of the considerable impediments to residential developments, problems of rent controls, the very limited amount of mortgage finance available, distortions of pricing (rent) due to concessionary loans releases by the Government, laws/procedures which make site approval difficult, and considerable red tape in general.

On the basis of the developments in the last two decades, future housing supply has been estimated as shown in Table 9. In this computation the following assumptions have been considered in order to determine a reasonable forecast.

- a) Current policy on housing construction will be continued during the decade.
- b) Public sector housing program will continue as in the case of 1.5 million houses program.
- c) Liberalization of imports will lead to low prices of building materials.
- d) Employment opportunities in Middle East countries will increase at 3 per cent rate annually.
- e) USAID housing guarantee may ease the resource problem of the housing finance agencies.
- f) Current trends in population growth, number of persons per household, and better industrial development with improved economic activities would continue for next decade (assumed an annual economic growth at 5-6% from 1992-2003).

CHAPTER 7

PROBLEMS OF HOUSING IN SRI LANKA AND ALTERNATE SOLUTIONS

Housing needs during 1992-2003 have been estimated on the basis of trends in housing construction as shown in the previous sections of this study. Accordingly, housing requirements of the country range from 144,864 in 1992 to 167,888 in 2003. Similarly, probable housing supply too is estimated on the basis of trends which determine the housing construction of the country. Financial resources availability, expected expansion of economic activities and income levels, trends in existing government and private sector housing development programs and the prices of building materials were the prime factors that would determine the housing supply of Sri Lanka between 1992 to 2003. When considering the above demand and supply situations, the core problem in the housing sector and its development is the temporary imbalance and an unsatisfied gap between the supply and demand for housing. It will be extremely difficult to bridge this gap as the expected growth of Sri Lanka's development activities is not sufficient enough to satisfy the population expansion of the country. Furthermore, the low income categories such as Janasaviya beneficiaries, food stamp holders cannot meet their demand for housing from their own resources because of low level of income. The income of majority is either below subsistence level or just about the subsistence level. Hence, financial resource requirement of this group has to be fulfilled by providing concessionary loans and grants by the public sector or by grants from non-governmental organizations. Approximately this group in this country may range between one third to 40 percent during the period of 1992-2003 if the present level of development activity continues.

The second major problem in the housing construction field is to eliminate price distortions in the housing market. Housing market in Sri Lanka is an imperfect market due to non-availability of sufficient number of building construction firms for supply of housing, availability of subsidiary loans for high income earners, particularly government sector employees, bank employees and so forth and the legislations which prohibit the automatic determination of prices for housing (rent). These distortions have to be eliminated in order to ensure a suitable and realistic pricing structure, which will determine the prices of housing on demand and supply of the country. Then only resource allocation of the country may determine appropriate level of housing as in the other fields.

The third problem in the housing field is the low recovery rate of loans given by the housing financial institutions. The government intervention for decision making of the financial institutions has to be eliminated or maintained at a minimal level in order to determine the free flow of housing loans and housing loan collections. Table 10 gives the details of past and future recovery rates of individual banks and other financial institutions. The recovery rates in the financial institutions are somewhat impressive when compared with other sector loans as

most of the housing loans are given on the basis of mortgage loans and to the government employees. In contrast average recovery rates of the NHDA in the past vary between 35-36 percent over the last five years. This is the lowest figure that any institution can afford. Hence, drastic action may be necessary in order to correct this situation.

The fourth problem of the housing industry in Sri Lanka is removal of rent controls. The delimiting effects of rent controls and related laws of investment in rental housing have been suggested by several studies. If this becomes a reality, the average rent may go up by 20 - 40 percent and the investment on housing would rise accordingly. This means that the housing industry will become the popular investment among investors of the country. In the short-run this may adversely affect the rented house owners, but the industry and the housing sector would benefit tremendously because in the long-run investment in housing will increase to an appropriate level.

The other problem in the housing industry is the necessity to accelerate upgrading during the first five to ten years to achieve the "shelter for all by 2000" especially to provide upgrading facilities to estate workers in order to uplift the social standards of estate workers. Providing electricity, sanitary and appropriate water supply schemes for rural poor is the other necessity in the housing development. Elimination or upgrading of slums and shanties is a pre-requisite in the case of urban development of Sri Lanka. A better portion of houses has to be directed towards the upgrading as in the case of one million and one point five million housing programs.

At present the most important problem in the urban area in regard to housing construction is the inefficient utilization of the urban land for small houses scattered all over the Colombo metropolitan areas. This will have to be eliminated at any cost for better utilisation of prime land in the city. Construction of large scale flats or apartment building development projects would be an appropriate solution to this problem. These buildings have to be rented back to the same residents in those areas at concessionary rates initially and concessions have to be eliminated gradually.

In general, realisation of an appropriate economic development is the final goal to all problems in the housing sector and other sectors as well. Industrial development through regional development basis is a more appropriate solution. This would ease up internal migration from rural to urban sectors. Simultaneously inflation rate also has to be checked in order to provide appropriate environment to the economic development to enhance overall living standards of the country.

CHAPTER 8
RECOMMENDATIONS

Following recommendations are made in order to solve some of the problems which are apparent in the housing industry in Sri Lanka.

- a) Conduct a detailed housing finance survey with a view to strengthening the data base. Number of loans granted, recovery figures and rates, amount of loans granted by both private and public sector, collateral obtained and new trends in the housing finance sector should be identified.
- b) Establish a coordinating body in order to collect data frequently and to monitor housing finance as in the case of the Monitoring Committee of the credit needs of Sri Lanka.
- c) Establish a middle level committee to evaluate the progress of housing programs of different institutions.
- d) Organise a comprehensive study group on real estate developers and analyze their contribution to the housing field.
- e) Establish a national housing development bank as in India to coordinate and evaluate housing programs, and to monitor their progress. This should be considered a pre-requisite. This bank can, not only help in negotiating with foreign donor countries for assistance but also can provide guarantees for loans granted by the housing finance agencies within the country and by foreign donors as well.
- f) Monitor the USAID Housing Guarantee program through the implementing agency, the Development Finance Department of the Central Bank of Sri Lanka. Performance evaluations, proper management and day-to-day problem solving in regard to the above program have to be undertaken with the supervision of the USAID Agency. Monthly, quarterly, half-yearly and annual performance reports need to be prepared by the Development Finance Department of Central Bank of Sri Lanka.
- g) Monitor the overall housing sector performance semi-annually and annually through the Economic Research Department of the Central bank of Sri Lanka, as the Bank has the authority to collect relevant information from the commercial banks, development banks, savings banks and other government institutions. The suggested format for data collection may be based on the source and use of funding depending on the private and public sectors. The Data base needs to be updated annually or semi-annually as well. With this in view,

computer packages can be developed in order to identify the basic indicators to assess the performance of the housing sector. Funding for computer packages will have to be raised from the USAID program.

ANNEXURE I

SMPL 1975 - 1991

17 Observations

LS // Dependent Variable is HHD ↓

```
=====
VARIABLE      COEFFICIENT   STD. ERROR   T-STAT.   2-TAIL SIG.
=====
C              -2098.5231    771.59492   -2.7197212  0.013
PD             26.487500    5.4899709   4.8247251  0.000
COCON         0.4168395    0.5616469   0.7421733  0.472
OWD           -0.0062142    0.0398874   -0.1537967  0.879
PCGDP        -0.2243153    0.1030834   -2.1760562  0.050
=====
```

```
=====
R-squared      0.985028      Mean of dependent var  2852.071
Adjusted R-squared 0.980038      S.D. of dependent var  302.8588
S.E. of regression 42.79012      Sum of squared resid  21971.93
Durbin-Watson stat 1.591193      F-statistic           197.3795
Log likelihood   -85.01857
=====
```

```
=====
Covariance Matrix
=====
C,C            595358.722      C,PD           -3971.09538
C,COCON       -90.6156763     C,OWD           14.1087052
C,PCGDP        30.6040948     PD,PD           30.1397805
PD,COCON       0.12709777     PD,OWD          -0.04007242
PD,PCGDP       -0.48911404     COCON,COCON     0.31544726
COCON,OWD      -0.01926266     COCON,PCGDP     0.00995535
OWD,OWD        0.00159101     OWD,PCGDP       -0.00097324
PCGDP,PCGDP    0.01062619
=====
```

```
=====
Residual Plot      obs RESIDUAL  ACTUAL  FITTED
=====
ñ : ñ * : ñ 1975  22.7664  2401.40  2378.63
ñ : * ñ : ñ 1976 -16.0510  2440.70  2456.75
ñ :* ñ : ñ 1977 -37.6353  2480.70  2519.34
ñ : ñ :* ñ 1978  48.7481  2598.90  2550.15
ñ : ñ * : ñ 1979  34.6667  2650.30  2615.63
ñ : ñ * : ñ 1980  13.0175  2639.20  2686.18
ñ : * ñ : ñ 1981 -11.4158  2735.00  2746.42
ñ : * ñ : ñ 1982 -5.54440  2771.70  2777.24
ñ : * ñ : ñ 1983 -14.8245  2813.30  2828.12
ñ : * ñ : ñ 1984 -10.3612  2845.80  2856.16
ñ * : ñ : ñ 1985 -83.1143  2889.90  2973.01
ñ * : ñ : ñ 1986 -41.9221  2941.00  2982.92
ñ : ñ : * ñ 1987  63.1866  3146.30  3083.11
ñ : ñ * : ñ 1988  29.6031  3189.60  3160.00
ñ : * ñ : ñ 1989 -21.1462  3231.90  3253.05
ñ : * ñ : ñ 1990 -8.56097  3267.80  3276.36
ñ : ñ * : ñ 1991  38.5873  3381.70  3343.11
=====
```

L 1975 - 1991

Observations

// Dependent Variable is HHD 2

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
C	-2043.4157	659.50811	-3.0983936	0.008
PD	26.331081	5.1907674	5.0726759	0.000
COCON	0.3416012	0.2757863	1.2386448	0.237
PCGDP	-0.2281167	0.0963223	-2.3682657	0.034

Adjusted R-squared	0.984998	Mean of dependent var	2852.071
Unadjusted R-squared	0.981536	S.D. of dependent var	302.8588
Sum of squares of regression	41.15297	Sum of squared resid	22016.37
Durbin-Watson stat	1.572082	F-statistic	284.5195
Log likelihood	-85.03575		

Covariance Matrix

	434950.949	C, PD	-3344.35864
COCON	74.1819649	C, PCGDP	54.7886466
PD	26.9440664	PD, COCON	-0.33119285
PCGDP	-0.47507605	COCON, COCON	0.07605806
COCON, PCGDP	-0.00169066	PCGDP, PCGDP	0.00927798

Residual Plot				obs	RESIDUAL	ACTUAL	FITTED
:	ñ	*	:	ñ 1975	21.4106	2401.40	2379.99
:	*	ñ	:	ñ 1976	-17.1451	2440.70	2457.85
*	ñ	:	:	ñ 1977	-38.3846	2480.70	2519.08
:	ñ	:	*	ñ 1978	49.0042	2598.90	2549.90
:	ñ	*	:	ñ 1979	35.2165	2650.30	2615.08
:	ñ	*	:	ñ 1980	16.0726	2699.20	2683.13
:	*ñ	:	:	ñ 1981	-6.78840	2735.00	2741.79
:	*ñ	:	:	ñ 1982	-7.36912	2771.70	2779.07
:	*ñ	:	:	ñ 1983	-16.4784	2813.30	2829.78
:	*ñ	:	:	ñ 1984	-10.2533	2845.80	2856.05
*	ñ	:	:	ñ 1985	-83.3858	2889.90	2973.29
:	*ñ	:	:	ñ 1986	-42.0551	2941.00	2983.06
:	ñ	:	*	ñ 1987	61.7277	3146.30	3084.57
:	ñ	*	:	ñ 1988	28.6553	3189.60	3160.94
:	*ñ	:	:	ñ 1989	-21.1987	3231.90	3253.10
:	*ñ	:	:	ñ 1990	-8.29816	3267.80	3276.10
:	ñ	*	:	ñ 1991	39.2699	3381.70	3342.43

SMPL 1975 - 1991

17 Observations

LS // Dependent Variable is HHD 3

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
C	-1733.9326	545.82236	-3.1767342	0.008
PD	23.561582	4.3218374	5.4517513	0.000
COCON	-1.5536005	0.7146241	-2.1740110	0.050
OWD2	9.204D-06	3.296D-06	2.7920789	0.016
PCGDP	-0.1059669	0.0846089	-1.6138224	0.131

R-squared	0.990906	Mean of dependent var	2852.071
Adjusted R-squared	0.987875	S.D. of dependent var	302.8588
S.E. of regression	33.34935	Sum of squared resid	13346.15
Durbin-Watson stat	1.658867	F-statistic	326.8872
Log likelihood	-80.78100		

Covariance Matrix

C,C	297922.053	C,PD	-2306.21435
C,COCON	-26.5220715	C,OWD2	0.00036539
C,PCGDP	39.5987233	PD,PD	18.6782782
PD,COCON	0.45579152	PD,OWD2	-3.2698D-06
PD,PCGDP	-0.34436815	COCON,COCON	0.51068754
COCON,OWD2	-2.2376D-06	COCON,PCGDP	-0.02326956
OWD2,OWD2	1.0867D-11	OWD2,PCGDP	1.0762D-07
PCGDP,PCGDP	0.00715867		

Residual Plot

obs	RESIDUAL	ACTUAL	FITTED
ñ 1975	14.2111	2401.40	2387.19
ñ 1976	-21.1077	2440.70	2461.81
ñ 1977	-45.7535	2480.70	2526.45
ñ 1978	22.4992	2598.90	2576.40
ñ 1979	12.7956	2650.30	2637.50
ñ 1980	33.0958	2699.20	2666.10
ñ 1981	41.1685	2735.00	2693.83
ñ 1982	-3.52123	2771.70	2775.22
ñ 1983	-11.1359	2813.30	2824.44
ñ 1984	12.3835	2845.80	2833.42
ñ 1985	-43.9397	2889.90	2933.84
ñ 1986	-60.4735	2941.00	3001.47
ñ 1987	28.7797	3146.30	3117.52
ñ 1988	9.03738	3189.60	3180.56
ñ 1989	-1.77951	3231.90	3233.68
ñ 1990	-4.53597	3267.80	3272.34
ñ 1991	18.2751	3381.70	3363.42

SMPL 1975 - 1991
 17 Observations
 LS // Dependent Variable is HHD

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
C	-2994.6718	1002.4136	-2.9874612	0.014
PD	23.879131	3.8945589	6.1314084	0.000
COCON	-1.7690821	0.7170456	-2.4671321	0.033
OWD	-0.0638623	0.0320003	-2.0581754	0.067
OWD2	1.635D-05	5.233D-06	3.1237039	0.011
PCGDP	0.2481962	0.3396984	0.7306369	0.482
PCGDP2	-2.696D-05	2.839D-05	-0.9493610	0.365

R-squared	0.993923	Mean of dependent var	2352.071
Adjusted R-squared	0.990276	S.D. of dependent var	302.8588
S.E. of regression	29.86458	Sum of squared resid	8918.929
Durbin-Watson stat	1.929682	F-statistic	272.5768
Log likelihood	-77.35506		

Covariance Matrix

C,C	1004833.05	C,PD	-1655.38978
C,COCON	239.518144	C,OWD	8.54770967
C,OWD2	-0.00345312	C,PCGDP	-254.26306
C,PCGDP2	0.02399646	PD,PD	15.1675888
PD,COCON	0.47344506	PD,OWD	-0.00924383
PD,OWD2	-3.3546D-06	PD,PCGDP	-0.36747344
PD,PCGDP2	8.8213D-06	COCON,COCON	0.51115438
COCON,OWD	-0.00092275	COCON,OWD2	-2.9986D-06
COCON,PCGDP	-0.12255264	COCON,PCGDP2	9.0988D-06
OWD,OWD	0.00102402	OWD,OWD2	-5.9269D-08
OWD,PCGDP	-0.00164987	OWD,PCGDP2	4.2922D-08
OWD2,OWD2	2.7384D-11	OWD2,PCGDP	1.4587D-06
OWD2,PCGDP2	-1.1321D-10	PCGDP,PCGDP	0.11339500
PCGDP,PCGDP2	-9.3468D-06	PCGDP2,PCGDP2	8.0627D-10

Residual Plot

	obs	RESIDUAL	ACTUAL	FITTED
ñ	1975	33.2954	2401.10	2366.10
ñ	1976	-3.95599	2440.70	2444.66
ñ	1977	-38.5003	2480.70	2519.20
ñ	1978	2.39225	2598.90	2596.51
ñ	1979	-11.0175	2650.30	2661.32
ñ	1980	4.28801	2699.20	2694.91
ñ	1981	14.4864	2735.00	2720.51
ñ	1982	5.16643	2771.70	2766.53
ñ	1983	-1.08520	2813.30	2814.39
ñ	1984	22.5567	2845.80	2823.24
ñ	1985	-29.6631	2889.90	2919.56
ñ	1986	-52.8012	2941.00	2993.80
ñ	1987	34.9956	3146.30	3111.30
ñ	1988	16.8918	3189.60	3172.71
ñ	1989	8.19028	3231.90	3223.71
ñ	1990	-6.07318	3267.80	3273.87
ñ	1991	-1.16678	3381.70	3382.87

SMPL 1975 - 1991

17 Observations

LS // Dependent Variable is HHD 5

```
=====
      VARIABLE      COEFFICIENT      STD. ERROR      T-STAT.      2-TAIL SIG.
=====
      C              -2192.3705      536.69113      -4.0849761      0.002
      PD              24.174080      3.8646887      6.2551171      0.000
      COCON           -1.4648722      0.6385784      -2.2939584      0.042
      OWD             -0.0644272      0.0318209      -2.0246854      0.062
      OWD2            1.256D-05      3.374D-06      3.7226661      0.003
      PCGDP           -0.0643076      0.0835291      -0.7698823      0.458
=====
```

```
=====
R-squared              0.993375      Mean of dependent var      2852.071
Adjusted R-squared    0.990364      S.D. of dependent var      302.8588
S.E. of regression    21.73027      Sum of squared resid      9722.730
Durbin-Watson stat    1.969937      F-statistic                 329.8722
Log likelihood         -78.08857
=====
```

Covariance Matrix

```
=====
C,C              288037.370      C,PD              -1901.32867
C,COCON          -31.0006981      C,OWD              7.20501273
C,OWD2          -8.5064D-05      C,PCGDP            23.3449173
PD,PD            14.9358184      PD,COCON           0.37549119
PD,OWD          -0.00962629      PD,OWD2            -2.0970D-06
PD,PCGDP        -0.26282555      COCON,COCON        0.40778233
COCON,OWD       -0.00139449      COCON,OWD2         -1.7056D-06
COCON,PCGDP     -0.01692049      OWD,OWD            0.00101257
OWD,OWD2        -5.2765D-08      OWD,PCGDP          -0.00114195
OWD2,OWD2       1.1386D-11      OWD2,PCGDP         1.4503D-07
PCGDP,PCGDP     0.00697711
=====
```

```
=====
Residual Plot      obs RESIDUAL      ACTUAL      FITTED
=====
n̄      :      n̄      *:      n̄ 1975  25.6413  2401.40  2375.76
n̄      :      * n̄      :      n̄ 1976 -11.2101  2440.70  2451.91
n̄      * :      n̄      :      n̄ 1977 -40.6732  2480.70  2521.37
n̄      :      n̄ *      :      n̄ 1978  10.1752  2598.90  2588.72
n̄      :      * n̄      :      n̄ 1979 -1.08310  2650.30  2651.38
n̄      :      n̄ *      :      n̄ 1980  7.63219  2699.20  2691.57
n̄      :      n̄ *      :      n̄ 1981  10.6871  2735.00  2724.31
n̄      :      n̄ *      :      n̄ 1982  16.8002  2771.70  2754.90
n̄      :      n̄ *      :      n̄ 1983  7.95961  2813.30  2805.34
n̄      :      n̄ *      :      n̄ 1984  19.5229  2845.80  2826.28
n̄      :*      n̄      :      n̄ 1985 -26.7362  2889.90  2916.64
n̄      * :      n̄      :      n̄ 1986 -65.8125  2941.00  3006.81
n̄      :      n̄ *      :      n̄ 1987  31.8873  3146.30  3114.41
n̄      :      n̄ *      :      n̄ 1988  11.7079  3189.60  3177.89
n̄      :      n̄*      :      n̄ 1989  5.84940  3231.90  3226.05
n̄      :      *n̄      :      n̄ 1990 -5.88832  3267.80  3273.69
n̄      :      n̄*      :      n̄ 1991  3.54053  3381.70  3378.16
=====
```

SMPL 1975 - 1991
 17 Observations
 LS // Dependent Variable is HHD 6

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
C	-2447.0113	651.31472	-3.7570335	0.003
PD	24.669508	3.6611720	6.7381450	0.000
COCON	-1.5054909	0.6064046	-2.4826508	0.030
OWD	-0.0623137	0.0309521	-2.0132275	0.069
OWD2	1.321D-05	2.927D-06	4.5133127	0.001
PCGDP2	-6.853D-06	6.863D-06	-0.9985551	0.339

R-squared	0.993598	Mean of dependent var	2852.071
Adjusted R-squared	0.990688	S.D. of dependent var	302.8588
S.E. of regression	29.22491	Sum of squared resid	9395.049
Durbin-Watson stat	1.970084	F-statistic	341.4560
Log likelihood	-77.79712		

Covariance Matrix

C,C	424210.868	C,PD	-2362.30051
C,COCON	-29.5923624	C,OWD	4.99921490
C,OWD2	-0.00022636	C,PCGDP2	0.00322916
PD,PD	13.4041802	PD,COCON	0.08444131
PD,OWD	-0.01388339	PD,OWD2	1.2359D-06
PD,PCGDP2	-2.0056D-05	COCON,COCON	0.36772656
COCON,OWD	-0.00256159	COCON,OWD2	-1.3880D-06
COCON,PCGDP2	-7.9275D-07	OWD,OWD	0.00095803
OWD,OWD2	-3.6785D-08	OWD,PCGDP2	-8.6371D-08
OWD2,OWD2	8.5651D-12	OWD2,PCGDP2	4.7374D-12
PCGDP2,PCGDP2	4.7106D-11		

Residual Plot				obs	RESIDUAL	ACTUAL	FITTED
ñ	:	ñ	*	ñ 1975	28.1650	2401.40	2373.23
ñ	:	* ñ	:	ñ 1976	-10.5246	2440.70	2451.22
ñ	*	ñ	:	ñ 1977	-41.5521	2480.70	2522.23
ñ	:	ñ *	:	ñ 1978	9.04179	2598.90	2589.86
ñ	:	*ñ	:	ñ 1979	-2.74465	2650.30	2653.04
ñ	:	ñ *	:	ñ 1980	7.30752	2699.20	2691.89
ñ	:	ñ *	:	ñ 1981	12.0466	2735.00	2722.95
ñ	:	ñ *	:	ñ 1982	13.8101	2771.70	2757.89
ñ	:	ñ*	:	ñ 1983	5.95976	2813.30	2807.34
ñ	:	ñ *	:	ñ 1984	21.7534	2845.80	2824.05
ñ	*	ñ	:	ñ 1985	-29.5416	2889.90	2919.44
ñ	*	ñ	:	ñ 1986	-59.9664	2941.00	3000.97
ñ	:	ñ	:*	ñ 1987	33.0938	3146.30	3113.21
ñ	:	ñ *	:	ñ 1988	12.2926	3189.60	3177.31
ñ	:	ñ*	:	ñ 1989	3.48898	3231.90	3228.41
ñ	:	*ñ	:	ñ 1990	-6.14042	3267.80	3273.94
ñ	:	ñ*	:	ñ 1991	3.51022	3381.70	3378.19

SMPL 1975 - 1991

17 Observations

LS // Dependent Variable is HHD 7

```
=====
VARIABLE      COEFFICIENT      STD. ERROR      T-STAT.      2-TAIL SIG.
=====
C              -1029.6991        153.67962       -6.7002969   0.000
PD             16.305121         0.6437219       25.329449   0.000
=====
```

```
=====
R-squared          0.977154      Mean of dependent var  2852.071
Adjusted R-squared 0.975631      S.D. of dependent var  302.8588
S.E. of regression 47.27766      Sum of squared resid   33527.66
Durbin-Watson stat 0.888863      F-statistic            641.5810
Log likelihood     -88.61071
=====
```

Covariance Matrix

```
=====
C,C              23617.4259      C,PD              -98.6511824
PD,PD           0.41437787
=====
```

```
=====
Residual Plot      obs RESIDUAL  ACTUAL  FITTED
=====
n̄ : n̄ * : n̄ 1975 28.2204 2401.40 2373.18
n̄ : n̄ * : n̄ 1976 10.4525 2440.70 2430.25
n̄ : *n̄ : n̄ 1977 -4.98508 2480.70 2485.69
n̄ : n̄ * : n̄ 1978 49.6250 2598.90 2549.27
n̄ : n̄ * : n̄ 1979 30.9131 2650.30 2619.39
n̄ : n̄ * : n̄ 1980 12.9621 2699.20 2686.24
n̄ : *n̄ : n̄ 1981 -14.8279 2735.00 2749.83
n̄ : *n̄ : n̄ 1982 -28.6737 2771.70 2800.37
n̄ : *n̄ : n̄ 1983 -44.1415 2813.30 2857.44
n̄ : *n̄ : n̄ 1984 -57.2959 2845.80 2903.10
n̄ * : n̄ : n̄ 1985 -73.5250 2889.90 2963.42
n̄ * : n̄ : n̄ 1986 -94.1675 2941.00 3035.17
n̄ : n̄ * : n̄ 1987 49.1730 3146.30 3097.13
n̄ : n̄ * : n̄ 1988 37.0357 3189.60 3152.56
n̄ : n̄ * : n̄ 1989 23.8982 3231.90 3208.00
n̄ : n̄ * : n̄ 1990 12.5136 3267.80 3255.29
n̄ : n̄ : * n̄ 1991 62.8231 3381.70 3318.88
=====
```

SMPL 1975 - 1991
 17 Observations
 LS // Dependent Variable is HHD

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
C	1851.0837	56.171046	32.954411	0.000
PCGDP2	2.451D-05	1.322D-06	18.541335	0.000
R-squared	0.958192	Mean of dependent var	2852.071	
Adjusted R-squared	0.955405	S.D. of dependent var	302.8588	
S.E. of regression	63.95660	Sum of squared resid	61356.70	
Durbin-Watson stat	1.240717	F-statistic	343.7811	
Log likelihood	-93.74755			
Covariance Matrix				
C,C	3155.18638	C,PCGDP2	-7.1362D-05	
PCGDP2,PCGDP2	1.7473D-12			

Residual Plot				obs	RESIDUAL	ACTUAL	FITTED
ñ	:	* ñ	:	ñ 1975	-21.9214	2401.40	2422.32
ñ	:	*	:	ñ 1976	2.35960	2440.70	2438.34
ñ	:	ñ*	:	ñ 1977	12.2299	2480.70	2468.47
ñ	:	ñ *	:	ñ 1978	50.2404	2598.90	2548.66
ñ	:	ñ *	:	ñ 1979	41.2875	2650.30	2609.01
ñ	:	ñ *	:	ñ 1980	30.1651	2699.20	2669.03
ñ	:	*	:	ñ 1981	-1.34522	2735.00	2736.35
ñ	:	* ñ	:	ñ 1982	-31.5590	2771.70	2803.26
ñ	:	* ñ	:	ñ 1983	-56.1482	2813.30	2869.45
ñ	*	* ñ	:	ñ 1984	-103.516	2845.80	2949.32
ñ	:	* ñ	:	ñ 1985	-34.9442	2889.90	2924.84
ñ	*	* ñ	:	ñ 1986	-141.749	2941.00	3082.75
ñ	:	ñ *	:	ñ 1987	64.9410	3146.30	3081.36
ñ	:	ñ *	:	ñ 1988	75.7311	3189.60	3113.87
ñ	:	ñ *	:	ñ 1989	95.0571	3231.90	3136.84
ñ	:	* ñ	:	ñ 1990	-1.15005	3267.80	3268.95
ñ	:	ñ *	:	ñ 1991	20.3207	3381.70	3361.38

SMPL 1975 - 1991

17 Observations

LS // Dependent Variable is HHD ²

```
=====
VARIABLE      COEFFICIENT   STD. ERROR   T-STAT.   2-TAIL SIG.
=====
C              2319.5705    56.131586   41.323801  0.000
COCON          2.6379058   0.2468301   10.687132  0.000
=====
R-squared      0.883914    Mean of dependent var  2852.071
Adjusted R-squared 0.876175    S.D. of dependent var  302.9588
S.E. of regression 106.5722    Sum of squared resid  170364.6
Durbin-Watson stat 0.648220    F-statistic          114.2148
Log likelihood   -102.4281
=====
Covariance Matrix
=====
C,C            3150.75496    C,COCON          -12.2386264
COCON,COCON   0.06092510
=====
```

```
=====
Residual Plot      obs RESIDUAL  ACTUAL  FITTED
=====
ñ * : ñ : ñ 1975 -152.680  2401.40  2554.08
ñ * : ñ : ñ 1976 -113.908  2440.70  2554.61
ñ : * ñ : ñ 1977 -73.9079  2480.70  2554.61
ñ : ñ * : ñ 1978 42.7093  2598.90  2556.19
ñ : ñ * : ñ 1979 66.9390  2650.30  2583.36
ñ : ñ * : ñ 1980 43.5603  2699.20  2655.64
ñ : ñ* : ñ 1981 8.92821  2735.00  2726.07
ñ : * : ñ 1982 -4.75582  2771.70  2776.46
ñ : *ñ : ñ 1983 -18.2980  2813.30  2831.59
ñ : * ñ : ñ 1984 -56.2201  2845.80  2902.02
ñ : * ñ : ñ 1985 -32.9596  2889.90  2922.86
ñ : ñ* : ñ 1986 9.43336  2941.00  2931.56
ñ : ñ : * ñ 1987 210.515  3146.30  2935.79
ñ : ñ : * ñ 1988 191.560  3129.60  2998.04
ñ : ñ * : ñ 1989 99.0631  3231.90  3132.84
ñ : * ñ : ñ 1990 -92.4243  3267.80  3360.22
ñ * : ñ : ñ 1991 -127.566  3381.70  3509.27
=====
```

SMI . 1975 - 1991
 17 Observations
 LS // Dependent Variable is HHD IC

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
C	919.21276	117.90602	7.7961480	0.000
PCGDP	0.3057409	0.0184494	16.571828	0.000

R-squared	0.948209	Mean of dependent var	2852.071
Adjusted R-squared	0.944756	S.D. of dependent var	302.8588
S.E. of regression	71.18390	Sum of squared resid	76007.21
Durbin-Watson stat	0.918035	F-statistic	274.6255
Log likelihood	-95.56760		

Covariance Matrix			
C,C	13901.8288	C,PCGDP	-2.15185298
PCGDP,PCGDP	0.00034038		

Residual Plot				obs	RESIDUAL	ACTUAL	FITTED
ñ	:	*	:	ñ 1975	4.84726	2401.40	2396.55
ñ	:	ñ *	:	ñ 1976	24.8856	2440.70	2415.81
ñ	:	ñ *	:	ñ 1977	26.9738	2480.70	2453.73
ñ	:	ñ *	:	ñ 1978	18.5596	2598.90	2550.34
ñ	:	ñ *	:	ñ 1979	30.8623	2650.30	2619.44
ñ	:	ñ *	:	ñ 1980	13.7222	2699.20	2685.48
ñ	:	ñ *	:	ñ 1981	-21.7154	2735.00	2756.72
ñ	:	ñ *	:	ñ 1982	-53.1957	2771.70	2824.90
ñ	:	ñ *	:	ñ 1983	-76.7184	2813.30	2890.02
ñ	:	ñ *	:	ñ 1984	-120.042	2845.80	2965.84
ñ	:	ñ *	:	ñ 1985	-53.0117	2889.90	2942.91
ñ	:	ñ *	:	ñ 1986	-145.610	2941.00	3086.61
ñ	:	ñ *	:	ñ 1987	60.9132	3146.30	3085.39
ñ	:	ñ *	:	ñ 1988	75.7794	3189.60	3113.82
ñ	:	ñ *	:	ñ 1989	98.2060	3231.90	3133.69
ñ	:	ñ *	:	ñ 1990	23.1222	3267.80	3244.68
ñ	:	ñ *	:	ñ 1991	62.4214	3381.70	3319.28

SMPL 1975 - 1991
 17 Observations
 LS // Dependent Variable is HHD /'

```
=====
VARIABLE      COEFFICIENT   STD. ERROR   T-STAT.   2-TAIL SIG.
=====
C              2421.0715    35.259668   68.664047   0.000
OWD            0.1253033    0.0085593   14.639370   0.000
=====
```

```
=====
R-squared          0.934587   Mean of dependent var  2852.071
Adjusted R-squared 0.930226   S.D. of dependent var  302.8588
S.E. of regression 79.99955   Sum of squared resid   95998.92
Durbin-Watson stat 0.826895   F-statistic            214.3112
Log likelihood     -97.53242
=====
```

Covariance Matrix

```
=====
C,C              1243.24421   C,OWD              -0.25199617
OWD,OWD         7.3262D-05
=====
```

Residual Plot

```
=====
obs RESIDUAL  ACTUAL  FITTED
=====
ñ * :          ñ :      ñ 1975 -99.7404  2401.40  2501.14
ñ   :*         ñ :      ñ 1976 -71.3418  2440.70  2512.04
ñ   : *        ñ :      ñ 1977 -44.6239  2480.70  2525.32
ñ   :          ñ * :      ñ 1978  56.4095  2598.90  2542.49
ñ   :          ñ * :      ñ 1979  67.2114  2650.30  2583.09
ñ   :          ñ : *      ñ 1980  95.5615  2699.20  2603.64
ñ   :          ñ : *      ñ 1981  92.3923  2735.00  2642.61
ñ   : *        ñ :      ñ 1982 -56.8578  2771.70  2828.56
ñ   :*         ñ :      ñ 1983 -70.8924  2813.30  2884.19
ñ   :*         ñ :      ñ 1984 -71.2218  2845.80  2917.02
ñ   : *        ñ :      ñ 1985 -52.6829  2889.90  2942.58
ñ   : *        ñ :      ñ 1986 -53.7099  2941.00  2994.71
ñ   :          ñ : *      ñ 1987  110.741  3146.30  3035.56
ñ   :          ñ : *      ñ 1988  110.686  3189.60  3078.91
ñ   :          ñ *      ñ 1989  77.8042  3231.90  3154.10
ñ   : *        ñ :      ñ 1990 -47.6863  3267.80  3315.49
ñ   : *        ñ :      ñ 1991 -42.0484  3381.70  3423.75
=====
```

SMPL 1975 - 1991

17 Observations

LS // Dependent Variable is HHD

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
C	-2447.0113	651.31472	-3.7570335	0.003
PD	24.669508	3.6611720	6.7381450	0.000
COCON	-1.5054909	0.6064046	-2.4826508	0.030
OWD	-0.0623137	0.0309521	-2.0132275	0.069
OWD2	1.321D-05	2.927D-06	4.5133127	0.001
PCGDP2	-6.853D-06	6.863D-06	-0.9985551	0.339

R-squared	0.993598	Mean of dependent var	2852.071
Adjusted R-squared	0.990688	S.D. of dependent var	302.8588
S.E. of regression	29.22491	Sum of squared resid	9395.049
Durbin-Watson stat	1.970084	F-statistic	341.4560
Log likelihood	-77.79712		

Covariance Matrix

C,C	424210.868	C,PD	-2362.30051
C,COCON	-29.5923624	C,OWD	4.69921490
C,OWD2	-0.00022636	C,PCGDP2	0.00322916
PD,PD	13.4041802	PD,COCON	0.08444131
PD,OWD	-0.01388339	PD,OWD2	1.2359D-06
PD,PCGDP2	-2.0056D-05	COCON,COCON	0.36772656
COCON,OWD	-0.00256159	COCON,OWD2	-1.3880D-06
COCON,PCGDP2	-7.9275D-07	OWD,OWD	0.00095803
OWD,OWD2	-3.6785D-08	OWD,PCGDP2	-8.6871D-08
OWD2,OWD2	8.5651D-12	OWD2,PCGDP2	4.7374D-12
PCGDP2,PCGDP2	4.7106D-11		

Residual Plot				obs	RESIDUAL	ACTUAL	FITTED
ñ	:	ñ	*	ñ 1975	28.1650	2401.40	2373.23
ñ	:	* ñ	:	ñ 1976	-10.5246	2440.70	2451.22
ñ	*	ñ	:	ñ 1977	-41.5521	2480.70	2522.25
ñ	:	ñ *	:	ñ 1978	9.04179	2598.90	2589.86
ñ	:	*ñ	:	ñ 1979	-2.74465	2650.30	2653.04
ñ	:	ñ *	:	ñ 1980	7.30752	2699.20	2691.89
ñ	:	ñ *	:	ñ 1981	12.0466	2735.00	2722.95
ñ	:	ñ *	:	ñ 1982	13.8101	2771.70	2757.89
ñ	:	ñ*	:	ñ 1983	5.95976	2813.30	2807.34
ñ	:	ñ *	:	ñ 1984	21.7534	2845.80	2824.05
ñ	*	ñ	:	ñ 1985	-29.5416	2889.90	2919.44
ñ *	:	ñ	:	ñ 1986	-59.9664	2941.00	3000.97
ñ	:	ñ	:*	ñ 1987	33.0938	3146.30	3113.21
ñ	:	ñ *	:	ñ 1988	12.2926	3189.60	3177.31
ñ	:	ñ*	:	ñ 1989	3.48898	3231.90	3228.41
ñ	:	*ñ	:	ñ 1990	-6.14042	3267.80	3273.94
ñ	:	ñ*	:	ñ 1991	3.51022	3381.70	3378.19

ANNEXURE II

Table 1
Basic Indicators

	Unit	Island		Urban		Colombo		Rural	
		81/82	86/87	81/21	86/87	81/82	86/87	81/82	86/87
Average size of Household	No.	5.2	5.0	5.4	5.5	6.1	6.5	5.2	5.1
% of self owned houses	%	79.4	82.9	66.4	74.9	51.2	63.3	89.9	93.9
% of rented houses	%	6.8	5.7	22.9	18.9	34.4	26.6	3.5	2.9
% of houses with electricity	%	16.0	23.0	42.4	48.4	59.0	49.0	9.3	20.7
Average person per room	%	1.5	1.3	1.5	1.2	1.8	1.8	1.5	1.2
Average floor area per person	Sq.m	11.2	11.2	12.5	14.0	9.3	10.0	11.5	11.0
Pipe-borne water	%	6.5	7.7	22.15	24.1	58.6	56.0	3.5	9.1
Percentage of latrines	%	61.0	63.0	61.63	-	81.0	83.0	63.9	83.6
Mean income per I R	Month	1111	1817	1625	2914	1979	3847	1077	1674

Source: Consumer Finance & Socio-Economic Survey
1981/82 & 1986/87 - Central Bank of Sri Lanka

I R - Per income Receiver

Table 2

Public Sector Housing Programme

Performance of Hundred Thousand House Programme (HTHP)

Hundred Thousand House Programme	NO. OF UNITS COMPLETED								TOTAL EXP. 80-86
	1980	1981	1982	1983	1984	1985	1986	80-86	
Direct construction	2799	2364	1810	1312	715	315	217	9532	3412.1
Rural Housing	1144	5942	4492	7386	3202	2669	543	26378	805.4
Electoral Housing	1600	491	1140	2960	200	240	57	6688	275.0
National Housing Fund								28000	28000
TOTAL	5545	8797	7442	11658	4117	3224	29817	70598	*4493.5

Source: Ministry of Local Govt. Housing & Construction
National Housing Development Authority

* This includes about 12100 houses completed during 1978-1979

Table 3

Public Sector Housing Programme

Performance of Million Houses Programme (MHP)

	NO. OF UNITS COMPLETED									TOTAL EXP.
	1984	1985	1986	1987	1988	1989	1990	1991	'84-91	
<u>Rural Houses</u>										
Sub Prog.	16092	41135	39793	45245	33393	14672	4755	1485	196570	1360.8
<u>Urban Houses</u>										
Sub Prog.	-	2314	6751	7839	6847	5038	1507	374	30670	347.4
TOTAL	16092	43449	46544	53084	40240	19710	6262	1859	227240	1708.2

Source: Min. of local Govt. & Construction
National Housing Development Authority

Table 4

PUBLIC SECTOR HOUSING SUPPLY IN SRI LANKA

	<u>UNITS</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
1. <u>Hundred Thousand Houses Programme (HTHP)</u>					
1.1 Direct construction	No.	2,701	2,799	2,364	1,810
1.2 Rural Housing	No.	1,141	1,144	5,942	4,492
1.3 Electoral Housing	No.	1,680	3,360	491	1,140
1.4 Public Servants Quarters	No.		35	204	156
1.5 Slums & Shanty Upgrading					
2. <u>Million Housing Programme (MHP)</u>					
2.1 Rural Housing Sub Programme (RHSP)					
2.2 Urban Housing Sub Programme (UHSP)					
2.3 Plantation Housing Sub Programme (PHSP)					
2.4 Mahaweli & Major Settlement Scheme Housing Sub Programme (MSSHSP)					
3. <u>One Point Five Million Houses Programme (OPFMHP)</u>					
3.1 Rural Housing Sub Programme (RHSP)					
3.2 Urban Housing Sub Programme (UHSP)					
3.3 Provincial Council Housing Sub Programme (PCHSP)					
3.4 Disaster Housing Sub Programme (DHSP)					
3.5 Plantation Housing Sub Programme (PHSP)					
3.6 Mahaweli Housing Sub Programme (MHSP)					
3.7 Employees Housing Sub Programme (EHSP)					
4. Total No. of Houses under NHDA Sponsored Programmes		5,522	7,338	9,001	7,598
5. Total expenditure under public sector housing programme		588	1,391	1,187	854.2

- * Houses built under National Housing Fund. This does not include the houses built under NHF.
- + This does not include 1512 upgraded line rooms under JEDB and 1315 upgraded line rooms under SLSPC.
- ++ This does not include 1173 upgrading and 19 Health & Childcare Centres under JEDB and 471 upgrading and 82 Health & Childcare Centres under SLSPC.
- ** This does not include 3135 upgrading and 458 upgrading and 10 Health & Childcare Centres under SLSPC.

Source: National Housing Development Authority (NHDA)
Urban Development Authority (UDA)
Annual Reports of the Central Bank

Table 4a

**TOTAL INVESTMENT ON HOUSING BY THE
PUBLIC & PRIVATE SECTOR (RS. MILLION)*****

Institution	1986	1987	1988	1989	1990	1991
SMIB	493.5	502.7	541.6	334.6	270	281.6
HDFC	73.5	25.4	33.6	11.3	11.7	52.1
BOC	NA	221.5	284.1	372.2	587.1	686.9
PB	NA	200.9	306.1	405.5	367.1	324.1
NSB	NA	NA	NA	55.7	70.5	66.1
CORB	NA	NA	64.1	164.3	184.4	205.0
TCCS	NA	NA	75.0	NA	152.0	224.0
RRDBS*	NA	NA	NA	NA	NA	NA
Total Loans Govt. Financial Institution	567.0	1050.5	1304.5	1343.6	1642.8	1839.8
To.Ex.On.Pub.Se.Ho.	688.1	515.7	483.0	479.0	321.3	723.65
Total Expenditure on Public & Private Sector Housing **	1255.1	1566.2	1787.5	1822.6	1964.1	2563.5
Total Expenditure on Public & Private Housing as a % of GDP (at factor cost prices)	0.77	0.88	0.88	0.8	0.68	0.76

* Less than 1 percent of the loan portfolio is granted for housing purposes

** This does not include expenditure on housing by the Middle East employees, Real Estate Developer and Non-Government Organizations and the private individuals. For total expenditure please see Table 4b.

*** These numbers are annual allocations.

Source: Annual Reports of the Central Bank of Sri Lanka
Dept. of Co-operatives
National Federation of Thrift & Credit
Co-operative Societies
The National Housing Development Authority
The Urban Development Authority
Relevant Financial Institutions

TABLE 4b

**SECTOR-WISE CLASSIFICATION OF HOUSING INVESTMENT IN SRI LANKA
(1986-1991)**

	1986	1987	1988	1989	1990	1991
	(Rs. M.)	(Rs. M.)	(Rs. M.)	(Rs. M.)	(Rs. M.)	(Rs. M.)
1. Public Sector Institutions						
1.1 National Housing Development Authority (NHDA)						
a. R.H.S.P.	243.7	176.0	157.3	250.9	212.3	270.7
b. U.H.S.P.	72.4	76.7	105.2	45.1	40.2	49.9
c. Others +	372.6	323.0	220.5	183.0	68.8	402.1
1.2 State Mortgage & Investment Bank (S.N.I.B.)	493.5	502.7	541.6	334.6	270.0	231.6
1.3 Housing Development Finance Corporation Ltd. (HDFC)	73.5	25.4	33.6	11.3	11.7	52.1
1.4 Bank of Ceylon (BOC)	NA	221.5	284.1	372.2	587.1	696.9
1.5 People's Bank (PB)	NA	300.9	305.1	405.5	357.1	324.1
1.6 National Savings Bank (NSB)	NA	NA	NA	55.7	70.5	66.1
1.7 Rural Regional Development Bank (RRDBs)					0.	0.5
Public Sector Housing Investment	1255.7 (15.7)	1626.2 (19.9)	1648.4 (19.6)	1658.3 (19.5)	1627.8 (18.5)	2132.0 (23.2)
2. Private Sector						
2.1 Co-operative Rural Banks (CORB)	NA	NA	64.1	164.3	124.4	205.0
2.2 Thrift & Credit Co-operative Societies (TCOS)	NA	NA	75.0	NA	152.0	224.0
2.3 Other Private Sector	6731.0	6555.7	6622.5	6660.9	6832.5	6651.7
3. Total Private Sector Investment on Housing	6731.0 (24.3)	6555.7 (80.1)	6761.6 (80.4)	6925.1 (80.5)	7108.9 (81.5)	7080.7 (76.8)
4. Total Housing Investment (Public & Private)	7986.7 (100.0)	8181.9 (100.0)	8410.0 (100.0)	8483.4 (100.0)	8216.7 (100.0)	9212.7 (100.0)

contd...2/-

	1986 (Rs.M.)	1987 (Rs.M.)	1988 (Rs.M.)	1989 (Rs.M.)	1990 (Rs.M.)	1991 (Rs.M.)
5. Capital Budget	35,112.0	34,606.0	39,572.0	36,977.0	40,835.0	53,979.0
6. Total Govt. Budget	69,714.0	72,242.0	83,917.0	94,470.0	114,909.0	143,062.0
7. Public Sector Housing Investment as a percentage of Capital Budget (%)	3.6	4.7	4.2	4.5	4.0	4.0
8. Public Sector Housing Investment as a percentage of Total Govt. Budget	1.8	2.2	1.9	1.8	1.4	1.5
9. Gross Domestic Product at current factor cost price (GDP)	162,712	177,731	203,516	228,138	290,495	339,058
10. Housing Investment as a percentage of GDP at current factor cost price	4.9	4.6	4.1	3.7	3.0	2.7

NOTE : Total investment on housing is estimated on the basis of data collected from the report on Consumer Finances and Socio-Economic Survey of the Central Bank of Sri Lanka 1986-87 Part II, Colombo, Sri Lanka, December 1990.

Other Private Sector = Total Housing Investment - (Public Sector Investment on Housing Investment + Housing Investment by CORE + TCCs).

N.A. = Not available

* This includes expenditure of all other programmes under 1 million and 1.5 million of the NHDA.

Source : 1. Annual Report of the Central Bank of Sri Lanka.
2. Data Collected from the NHDA, SMIB, HDFC, BOC, PB, NSB, FRDBs, CORE and TCCs.
3. Annual Reports of the respective institutions.
4. Consumer Finance & Socio-Economic Survey of the Central Bank 1986-87.

TABLE 5

TOTAL POPULATION AND NO. OF HOUSEHOLD BY SECTOR 1970-1991

Year	All Island		Urban Sector		Rural Sector		Estate Sector	
	Popu- lation (Mill.)	No. of H. hold (Mill.)						
1970	12.514	2.227	2.798	0.469	8.572	1.523	1.144	0.235
1971	12.690	2.253	2.827	0.491	8.693	1.544	1.180	0.223
1972	12.861	2.288	2.876	0.498	8.910	1.535	1.175	0.225
1973	13.091	2.329	2.880	0.498	8.902	1.581	1.389	0.250
1974	13.204	2.358	2.946	0.514	9.066	1.631	1.272	0.252
1975	13.496	2.436	2.992	0.525	9.211	1.657	1.292	0.254
1976	13.717	2.475	3.042	0.531	9.362	1.684	1.313	0.261
1977	13.942	2.517	3.092	0.540	9.515	1.711	1.335	0.266
1978	14.190	2.599	3.123	0.551	9.649	1.758	1.419	0.270
1979	14.471	2.705	2.914	0.524	10.313	1.922	1.244	0.243
1980	14.733	2.755	2.963	0.534	10.504	1.963	1.266	0.250
1981	14.993	2.857	2.742	0.500	11.178	2.145	1.078	0.233
1982	15.187	2.937	2.742	0.514	11.382	2.171	1.165	0.252
1983	15.416	2.981	2.783	0.522	11.412	2.216	1.221	0.243
1984	15.595	3.016	2.815	0.528	11.534	2.249	1.196	0.237
1985	15.837	3.063	2.859	0.536	11.764	2.284	1.214	0.243
1986	16.117	3.160	2.909	0.546	11.972	2.325	1.236	0.252
1987	16.361	3.208	2.916	0.544	12.112	2.380	1.333	0.264
1988	16.586	3.252	2.956	0.572	12.387	2.412	1.343	0.263
1989	16.806	3.295	2.995	0.579	12.441	2.444	1.370	0.272
1990	16.998	3.315	3.012	0.582	12.511	2.456	1.377	0.273
1991	17.249	3.332	3.056	0.588	12.698	2.490	1.493	0.296

Sources : 1. Census and Statistics Department of Sri Lanka
 2. Consumer Finance and Socio-Economic Surveys of 1978/79, 1981/82 and 1986/87 Central Bank of Sri Lanka

Definition : Estate Sector household in Tea, Rubber and Coconut estates with 20 or more acres and with 10 or more resident workers.

TABLE 5(a) POPULATION FORECAST FOR 1992 - 2003

Year	<u>All Island</u>		<u>Urban Sector</u>		<u>Rural Sector</u>		<u>Estate Sector</u>	
	Popu- lation (Mill.)	No. of H.hold (Mill.)						
1992	17.477	3.426	3.110	0.598	12.841	2.616	1.520	0.311
1993	17.630	3.470	3.150	0.606	13.000	2.551	1.540	0.313
1994	17.929	3.515	3.191	0.614	13.177	2.584	1.560	0.317
1995	18.161	3.561	3.251	0.625	13.330	2.614	1.580	0.322
1996	18.379	3.611	3.290	0.634	13.490	2.650	1.599	0.328
1997	18.590	3.659	3.329	0.641	13.677	2.679	1.637	0.335
1998	18.823	3.698	3.369	0.649	13.797	2.711	1.656	0.338
1999	19.048	3.742	3.410	0.657	13.962	2.743	1.676	0.342
2000	19.258	3.791	3.446	0.665	14.097	2.775	1.715	0.351
2001	19.470	3.833	3.507	0.677	14.252	2.806	1.713	0.350
2002	19.684	3.875	3.543	0.684	14.409	2.836	1.734	0.355
2003	19.900	3.917	3.582	0.692	14.547	2.864	1.771	0.361

Note : This forecast and the forecast of Dr. A. T. P. L. Abeykoon, Population Division, Ministry of Health and Women's Affairs are almost equal and variance is very marginal.

TABLE 6

HOUSING DEMAND FORECAST FOR 1992 - 2003

Year	All Island	Urban Sector	Rural Sector	Estate Sector
1992	144,864	52,042	63,322	9,500
1993	165,186	53,072	101,114	11,000
1994	152,233	51,165	87,068	14,000
1995	168,236	56,766	96,990	14,500
1996	162,267	53,430	97,337	11,500
1997	158,597	51,587	91,010	15,500
1998	161,190	49,172	103,729	9,000
1999	164,275	49,357	100,418	14,500
2000	164,215	47,060	100,655	16,500
2001	159,210	51,141	92,577	15,500
2002	161,290	53,378	89,902	18,000
2003	167,888	54,129	92,769	21,000

Note : This table includes only new units, replacements and the upgradings. This does not include improvements to existing housing stock by providing electricity connections under RE programme, water supplies through pipe borne water by Water Resources Board etc. Hence, the estimates are different from the PAIDCO estimate (18) and the Urban Institute's estimates (19). However, some of upgradings required for structures, maintenance work due to old age are included in this report. These estimates are based on the theme "shelter for all by 2000" but not "water and electricity for all by year 2000".

TABLE 6a

SECTOR-WISE HOUSING DEMAND FORECAST FOR 1992 - 2003

Year	All Island				Urban Sector			
	New Units	Replacements	Upgrading	Total	New Units	Replacements	Upgrading	Total
1992	54,000	39,000	51,864	144,864	20,000	10,000	22,042	52,042
1993	54,000	40,000	71,186	165,186	18,000	14,500	20,572	53,072
1994	55,000	40,500	66,733	152,233	18,000	16,000	17,165	51,165
1995	56,000	44,000	68,236	168,236	21,000	18,000	17,766	56,766
1996	60,000	38,000	64,267	162,267	19,000	15,500	18,930	53,430
1997	53,000	40,000	65,597	158,597	17,000	13,000	21,587	51,587
1998	54,000	40,500	66,690	161,190	18,000	14,500	16,672	49,172
1999	54,000	54,000	56,275	164,275	18,000	15,500	15,857	49,357
2000	59,000	63,000	42,215	164,215	18,000	15,000	14,060	47,060
2001	52,000	55,000	52,218	159,218	22,000	15,000	14,141	51,141
2002	52,000	66,000	43,290	161,290	20,000	18,000	15,378	53,378
2003	52,000	55,000	60,888	167,888	22,000	17,000	15,129	54,129

TABLE 6b

SECTOR-WISE HOUSING DEMAND FORECAST FOR 1992 - 2003

Year	Rural Sector				Estate Sector			
	New Units	Replacements	Upgrading	Total	New Units	Replacements	Upgrading	Total
1992	20,000	21,000	42,322	83,322	5,000	3,000	1,500	9,500
1993	33,000	20,500	47,614	101,114	3,000	5,000	3,000	11,000
1994	33,000	18,000	36,068	87,068	4,000	6,500	3,500	14,000
1995	30,000	28,000	38,990	96,990	5,000	8,000	1,500	14,500
1996	36,000	23,000	38,337	97,337	5,000	1,500	5,000	11,500
1997	28,000	23,500	40,010	91,010	8,000	3,500	4,000	15,500
1998	33,000	23,500	47,229	103,729	3,000	2,500	3,500	9,000
1999	32,000	33,500	34,918	100,418	4,000	6,000	4,500	14,500
2000	32,000	34,500	34,155	100,655	9,000	3,500	4,000	16,500
2001	31,000	28,500	33,077	92,577	8,000	4,500	3,000	15,500
2002	30,000	36,500	23,402	89,902	5,000	5,500	7,500	18,000
2003	28,000	33,000	31,759	92,759	9,000	5,000	7,000	21,000

TABLE 2

PUBLIC SECTOR HOUSING SUPPLY IN SRI LANKA
(No. of loans granted)

	1986	1987	1988	1989	1990	1991
1. <u>National Housing Development Authority (NHDA)</u>						
1.1 R.H.S.P.	38,601	40,076	27,912	14,672	19,427	24,857
1.2 U.H.S.P.	6,751	7,889	3,735	4,044	4,216	5,896
1.3 Other Programmes*	4,416	8,981	8,057	4,027	4,848	6,323
2. State Mortgage & Investment Bank (SMIB)	4,972	5,188	5,040	2,889	2,643	2,055
3. Housing Development Finance Corporation Ltd. (HDFC)	567	280	311	105	112	524
4. Bank of Ceylon (BOC)	NA	332	489	382	1327	1926
5. People's Bank (PB)	***	9,699	10,777	6,369	6,990	10,650
6. National Savings Bank (NSB)	NA	NA	NA	457	591	565
7. Regional Rural Development Banks (RRDBs)**	NA	NA	NA	NA	NA	NA
Total Public Sector (see percentage of Total)	65,807*	77,478*	56,914	24,267	48,815	55,655
	(55.3)	(57.9)	(58.3)	(36.5)	(38.5)	(39.2)

* This includes NHDA funded other programmes excluding RHSP and UHSP.

** Only one per cent of the other loans. Hence, this figure is very marginal.

*** Estimated on the basis of the trend.

* This does not include 1512 & 1315 upgraded line rooms under JEDB and SLSPC respectively.

Source : National Housing Development Authority (NHDA).

Annual Reports of the Central Bank.

Relevant data collected from different banks such as BOC, SMIB, HDFC, PB, NSB and RRDBs.

TABLE 9

PRIVATE SECTOR HOUSING SUPPLY IN SRI LANKA 1986-88

	1986	1987	1988	1989	1990	1991
1. Co-operative Rural Banks (CORB) *	NA	NA	NA	2,395	9,252	10,304
2. Thrift & Credit Co-operatives (TCCs) **	NA	NA	NA	NA	NA	7,245
3. Real Estate Developers	132	60	64	40	58	125
4. Middle East Income Earners	23,778	26,631	20,751	29,186	29,877	31,969
5. Non-Government Organizations	554	897	1,079	1,025	1,086	1,151
6. Other Individuals +	29,337	28,655	30,086	27,992	29,671	32,846
Total Private Sector (as a percentage of total)	52,093 (44.7)	56,243 (42.1)	51,911 (47.7)	59,598 (52.5)	69,954 (61.5)	84,182 (60.2)

* Less than one per cent of the other loans is meant for housing.
+ Residual figure when adjusted for total sector and all other sub headings.

** As there was no sufficient time to collect data, I was not able to complete data set. Due to time constraints the data set is incomplete.

Notes : Data relevant to CORB and TCCs were collected from the relevant authorities.
Reliable data relevant to Real Estate Developers are not available.

Source : Foreign Employment Bureau.
The Census Finance & Socio-Economic Survey of 1986-87.

TABLE 9

HOUSING SUPPLY FORECAST 1992-2003

Sector	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
1. Public Sector Housing Supply	56,430 (60.0%)	58,379 (57.4%)	58,487 (38.7%)	58,655 (38.3%)	58,883 (37.8%)	59,111 (37.2%)	59,359 (36.7%)	59,791 (36.1%)	59,607 (35.3%)	59,476 (35.1%)	59,249 (34.7%)	59,315 (34.9%)
2. Private Sector Housing Supply	87,664 (60.0%)	88,818 (59.6%)	88,851 (61.1%)	91,177 (61.7%)	94,757 (62.2%)	98,049 (63.8%)	99,079 (63.9%)	101,682 (64.3%)	105,572 (64.7%)	108,189 (64.7%)	109,578 (65.1%)	110,659 (65.1%)
3. Total Housing	141,024	143,190	145,338	147,833	150,747	153,855	156,929	161,439	160,654	168,665	168,301	169,984

NOTE : This was estimated on the basis of the past trends in the Private Sector and Public Sector. Growth rate of households too can be used in this estimation.

Table 10

RECOVERY RATES OF THE HOUSING PROGRAMMES
BY DIFFERENT AGENCIES

Name of Financial Agency	Past %	Future %
N H D A		
RHSP	35	40
UHSP	36	40
S M I B	75	85-90
H D F C	75	70-77
B O C	80	80
P B	75-80	75
N S B	90	95
C O R B	84	84
T C C Public Servants Loans	98-100	
Rehabilitation Loans	10	95
R R D Bs Government Employee loans	98-100	90

Note: Recovery rates during the past four to five years were estimated on the basis of yearly average rates. However, future rates are estimated with the consultation of highest authority of the respective institutions. Low averages of recovery rates in the RHSP and UHSP loans programmes were due to the exemptions granted by the Government of low income borrowers. (Especially for Janasaviya beneficiaries). This type of distortions may affect the borrowers of the other institutions as well.

Foot Note: HDFC recovery rate during 1988-89 recorded a rate less than 75%. However, in 1989 it recorded more than 75%. According to the Chairman and the Finance Manager the probable overall recovery rate could be estimated at 75%.

ANNEXURE III

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