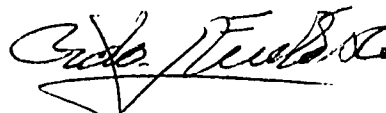


DATE: February 18, 1994

FROM: Eduardo Fuentes, RHUDO/SA Consultant.



SUBJECT: TDY/PARAGUAY. 01/31-02/14/1994. EXECUTIVE SUMMARY.

TO: Richard Nelson, USAID/PARAGUAY/REPRESENTATIVE, and
William Yaeger, Director RHUDO/SA, QUITO, ECUADOR.

PURPOSES:

1. To examine the possibilities of New Funding Sources for the Regional Low Cost Shelter Program;
2. to study the current GOP programs Indexation System, and
3. to examine the feasibility of implementing a Housing Guaranty Program accessing the Worldwide Housing Guaranty Authorization

I. BACKGROUND.

I.1.DISTRIBUTION OF NATIONAL INCOME. In 1992 the National University of Asunción, with IDB financial support, developed a survey and a study on the distribution of the national income in Paraguay. The following are some of the study's conclusions:

- a. the lower half of the population receives 15.8% of the total income; the upper 10% of the population receives 42% of the national income; Median Family Income, estimated for 1993 at 328,000 Gs/month, practically equals the MWU that currently is 345,000 Gs/month, (US\$187.45);
- c. Paraguay's MWU is one of the highest in the region. However, 66.3% of the population is below the poverty level and 47.1% suffer extreme poverty;
- d. the 1992 survey shows that the population is made up of 971,430 families that live in 868,189 homes; 73% have legal title for their dwellings; infrastructure services are precarious; only 33.6% of the population has access to potable water and only 49% to sewage;
- e. according to CONAVI, the quantitative deficit is 330,000 units and the qualitative deficit reaches 200,000 units; based on 1992 survey data, the qualitative deficit reaches 560,000 units; the survey's results show that the classification lacks precision and produces overlapping areas.

Presently there is not enough information to determine the overlapping portion. However, the available information is sufficient to arrive at the conclusion that in Paraguay the need for home improvements is much greater than the demand for new homes.

I.2.REGIONAL LOW COST SHELTER PROGRAM. During the past three years, CREDICOOP, with CHF and the U.S. Peace Corp technical support, has developed a low cost shelter program through its cooperative members.

This program operates under CONAVI's financial support. AID is financing CHF and U.S. Peace Corp technical assistance to CREDICOOP and the cooperatives, (US\$445,00 - regionally). The cooperatives on-lend these funds to their members for home improvements.

CONAVI's currently contracted credits to CREDICOOP will produce approximately 1,200 loans at an average amount of US\$1,563. CREDICOOP lends to the Cooperatives at 4% interest and with 3 to 5 year terms. The cooperatives on-lend to final beneficiaries at 7% interest and for the same period of time. These loans are indexed to the minimum wage unit, (MWU).

Further program resources from CONAVI shouldn't be expected. What makes it improbable, is this GOP Government Institution's financial and structural situation.

Loan Recuperation. At the present stage of the program, the cooperatives and CREDICOOP have promptly fulfilled their obligations with their respective creditors. Cooperatives' borrowers are also correctly paying their loans. The delinquency ratio for the borrowers is in the order of 5%, and the credit unions and CREDICOOP has repaid at 100%.

Capital and Payments Correction. The program corrects capital and payments to the annual or biannual variations of the MWU. In the period between 1991 and 1993 the salary index has always been below the rate of inflation.

Therefore, in this three-year period, by applying salary correction, the investor (CONAVI) has not fully recovered their capital in real terms.

I.3.S&L SOCIETIES. Currently there are six S&L Associations operating in Paraguay. The analysis of their balances and statistic show that S&L average client is at median income level. However, their average housing loan borrower is at the IX decile.

This information also shows that S&Ls are familiar with low income loans for below median clients, although those loans usually don't have housing purposes.

The conclusion is that S&L Societies could participate in a home improvement loan program, along with Cooperatives. Nevertheless their participation would have to be encouraged through mechanisms such as refinancing operations.

II. NEW FUNDING SOURCES FOR THE LOW COST SHELTER PROGRAM.

The low cost shelter program is financially based on CONAVI. Funds go to the cooperatives through CREDICOOP. The participating cooperatives don't contribute, with their own capital, to the funding of the program. CONAVI's loans to CREDICOOP are all the funds available for the program. It is improbable that CONAVI, in a near future, will have sufficient financial resources to continue the program's total funding.

Therefore, cooperatives should contribute part of their own capital, increasing the total program funding and to increase their responsibility in the program's operations. CREDICOOP should provide an average of 70% of the loan and the respective cooperatives should contribute the remaining portion.

The other possible funding source for this program is for the cooperative and CREDICOOP to have a refinancing fund. The purpose of this mechanism is to accelerate the rotation of their investments. A higher rotation produces a multiplying factor that increases the efficiency of the available program funds.

III. GOP INDEXATION SYSTEMS.

Paraguay low cost shelter program and CONAVI, in its own credits, periodically apply salary correction to capital and payments. This type of indexation can't support real term recovery.

The only way to effectively protect the lender is by correcting the invested capital to the variation of the price of money, that is, to inflation. To guarantee a total and timely recuperation it is also necessary to correct payments to inflation.

Mono-indexation is perfectly acceptable for short term investments such as home improvement loans. However, during periods of salary lags, payments increase in relation to the borrower's income and may become unbearable for the family budget.

Therefore, loan contracts should include a clause establishing a maximum payment as a percentage of the family's income. When salary does not increase with inflation for prolonged periods of time, the term of the loan could require an extension. Loan contracts should also include this possibility.

IV. TO EXAMINE THE FEASIBILITY OF IMPLEMENTING A HOUSING GUARANTY PROGRAM ACCESSING THE WORLDWIDE HOUSING GUARANTY AUTHORIZATION.

Presently, the only source of money the low income shelter activity can expect to have in a near future is the US\$60 million IDB program. The IDB program doesn't cover home improvement. Using traditional methods, the maximum loan for the median income family would be of Gs 3,459,000 Gs. (US\$1,870).

This amount is not enough for a program exclusively oriented to new home loans. It is obvious that it would be necessary to implement a program of direct subsidies jointly with these credits.

The implementation of the IDB program, doesn't solve home improvement problems. Therefore large low income groups would be left unattended by what seems to be the only source of funds for direct loans. Low income groups, apparently, would also be left without subsidies in case of home improvements loans.

HOME IMPROVEMENT TARGET POPULATION. This group represents more than half of the housing deficit of Paraguay. According to the information obtained from the 1992 survey 72.5% of the families have clear property titles. . This is a surprising figure, but the cadastral and titling program developed by AID in the 80s may explain the survey's results.

The information gathered shows there is an ample range for a home improvement loans program. Where there is a home improvement need, there must be a home to improve. Therefore, out of that 73% that live in their own home it should be possible to build a portfolio, -wether mortgage or other-, of home improvements loans. Such a portfolio should be capable of sustaining housing bond issuing to refinance the home improvement fund operation.

IV.1. HG-PROGRAM FINANCIAL DESCRIPTION.

The following is a schematic description of the financial mechanism that may provide the funds for a possible new USAID-HG-Loan to Paraguay. The HG-Loan would be for the amount of US\$10 million.

THE FOREIGN INVESTOR is an American financial institution that grants the US\$10 million loan to the institutional borrower, with USAID's guaranty. The loan would have a 10-year term, a 4-year grace period and a rate of interest equivalent to Libor.

THE LOCAL TRUST FUND is a legal association made up of three local banks, one of them an American Bank authorized to operate in Paraguay (CITIBANK). The principal objective of the Trust is to disburse the funds through loans to CREDICOOP. This central cooperative institution will on-lend to the individual cooperatives to help them grant home improvement loans to their cooperative members.

Cooperatives' loans to their members will include a minimum of 10% from the cooperative's capital. Cooperatives capital contribution for the program is expected to average 30% of the total capital financing. The Trust could also make loans to other local financial institutions, -such as the S&L Societies-, if they meet the program requirements. In these cases the borrowers would directly on-lend to final beneficiaries.

The Foreign Investor will deposit the total amount of the US\$10 million loan in The Trust Fund. The unused quantities will be invested locally and in the USA, with the purpose of increasing the Trust Fund productivity and increase the available operating capital.

SWAP AGREEMENT. The Local Trust Fund and the Central Bank of Paraguay will subscribe a Swap Agreement to guaranty the dollar availability at the dates of payment to the foreign investor.

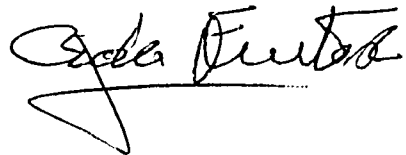
IV.2.THE REFINANCING FUND.

The Local Trust Fund will separate up to US\$4 million from the external loan to create a Refinancing Fund. The purpose of this fund is to reactivate the existing Cooperatives and S&L housing portfolios. This mechanism will provide new capital to invest in home improvements loan to the program's target population.

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DATE: February 18, 1994

FROM: Eduardo Fuentes, RHUDO/SA Consultant.



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TO: Richard Nelson, USAID/PARAGUAY/REPRESENTATIVE, and
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PURPOSES:

- I. To examine the possibilities of new Funding Sources for the Regional Low Cost Shelter Program;
- II. To study the current GOP programs Indexation System; and
- III. To examine the feasibility of implementing a Housing Guaranty Program accessing the Worldwide Housing Guaranty Authorization.

I. BACKGROUND.

I.1. DISTRIBUTION OF NATIONAL INCOME. In 1992 the National University of Asunción, with IDB financial support, conducted a survey and a study on the distribution of the national income in Paraguay. The results were published by the Department of Socioeconomic Investigations as "La Distribución del Ingreso en el Paraguay". The publication appears under the authorship of the Economist Pablo Sauma as leader of the team.

Some important aspects of the results appear in the annexed income chart. The chart distributes the national income by deciles (10% of total population). The fifth decile represents the median family income for 1992.

In the lower part of the chart the distribution appears as percentages of the total national income. The following are some of the conclusions that derive from this study:

- a. the lower half of the population perceives 15.8% of the total income;
- b. the upper 10% (decile X) of the population perceives 42% of the national income;
- c. the upper 30% of the population perceives 70% of the national income;
- d. the Median Family Income, estimated for 1993 is 328,000 Gs/month; it practically equals current Minimum Wage Unit = 345,000 Gs/month, (US\$187.45);
- e. the Rural Median Income is 45% of the Urban Median Income;

NOTE: The chart shows that the significant difference between rural and urban median income seriously distorts the country's median income. However, that seems to be the real situation in Paraguay; and it has to be the ruling parameter for AID promoted or financed housing programs. (AID's regulations).

f. the GOP increases the MWU twice a year, trying to follow the rate of inflation. This raise fully affects those who receive the MWU or less, which is the lower half of the population.

The other half of the population receives the raise as an absolute value and not as a percentage of the previous MWU. Therefore periodical increases have little effect on the upper deciles of the population. In spite of that distortion, the MWU series are acceptable for real income calculations;

g. Paraguay's MWU is one of the highest in the region; at the same time, 66.3% of the population is below the poverty level and 47.1% are at the level of extreme poverty; this information seems to suggest that an extremely distorted distribution of wealth is the principal origin of poverty in the country;

h. generally, employers consider the minimum salary as a maximum, and in rural areas most workers earn salaries below the established minimum wage;

i. the 1992 survey estimated the total population in 4,556,500 persons. This figure is 10% larger than the preliminary results of the 1992 official census, which declared 4,123,550. Later the official census organization recognized a 5% underestimation of the population due to omissions in urban areas.

The author expects bigger omissions in rural areas that will produce new corrections of census results. Progressively, census and survey results will get much closer;

j. the survey shows that the population is made up of 971,430 families that live in 868,189 dwellings; according to the survey, 87% of the families have ownership, or another form of tenancy, of their houses.

k. infrastructure services are precarious, particularly, in rural areas; only 33.6% of the population has access to potable water and only 49% to sewage services; 64.3% of the population has electricity.

l. CONAVI estimates the accumulated quantitative housing deficit at 330,000 units.

The quantitative deficit is the required number of new houses due to: new families formation, substitution of totally unacceptable units, and the need to eliminate over-crowding.

m. the qualitative housing deficit encompasses units that require improvements due to all possible causes.

They go from the lack of land title, the need for extra rooms or roof repair, to the installation of infrastructure services. The qualitative deficit has been estimated by CONAVI to be in the order of 200,000 units.

The mentioned figures appear at CONAVI's 1989 Housing Diagnostic based on the 1982 official census. The figures in this report are estimations originated on data from the 1992 Survey. Based on the survey and the corresponding analysis, the qualitative deficit can be estimated at 560,000 units.

Accepting CONAVI's figure of 330,000 units for the quantitative deficit, and adding both types of deficits, the result shows that the classification lacks precision and produces overlapping areas in the analysis. The reason is that there are units that classify in both groups. Overlapping is very common in cases of houses affected by over-crowding or obsolescence.

Presently there is not enough information to precisely determine the overlapping portion. However, the available information is sufficient to arrive at the conclusion that in Paraguay the need for home improvement loans is much greater than the need for new homes.

I.2. REGIONAL LOW COST SHELTER PROGRAM. During the past three years, the Paraguayan federation of cooperatives, CREDICOOP, -with CHF and the U.S. Peace Corp technical support-, has developed a low cost shelter program through its associated cooperatives. This program is financed by the National Housing Council (CONAVI).

USAID, through the Cooperative Agreement No. FAO-0192-A-00-3055-00, is financing the CHF and U.S. Peace Corp assistance to CREDICOOP and the cooperatives. (US\$445,000 - regionally).

The contracts between CONAVI, CREDICOOP and the US Peace Corp, state that the purpose of this program is to provide funds to the cooperatives through CREDICOOP. The cooperatives use these funds to grant home improvement loans to their associated members.

CONAVI has approved four lines of credit to CREDICOOP. The first three provided the selected cooperatives with 2,080 million Gs (US\$1,330,000). These credits were fully disbursed and produced approximately 920 home improvement loans for cooperative members. The average loan was of approximately US\$1,500.

CONAVI's fourth line of credit to CREDICOOP is for 1,000 million Gs (US\$545,000). This amount will increase the program's capital financing to date to US\$1,875,000. The disbursements on this line of credit began in August 1993.

By January 1994, 238 million Gs (US\$130,000) had been already used by the selected cooperatives to grant approximately 70 home improvement loans.

CREDICOOP expects the participating cooperatives to make approximately 220 additional loans, with the remaining 762 million Gs (US\$415,000).

The full disbursement of the fourth line of credit would place the number of home improvements loans in the order of 1,200 produced by the program. The program has an average amount of US\$1,563 per loan. CREDICOOP lends to the Cooperatives at 4% interest rate and with 3 to 5 year terms. The cooperatives on-lend to final beneficiaries at 7% interest and for the same period of time.

CREDICOOP and the cooperatives are supposed to receive new credits from CONAVI to continue this home improvement experience that has proven itself to be very successful. However, CONAVI is presently going through a very serious financial and structural crisis. Therefore, it is unlikely that CONAVI will be able to continue providing CREDICOOP the principal capital financing for the program.

I.3. LOAN RECUPERATION. According to program design CREDICOOP has to repay CONAVI's loans, independently of that institution credit relationship with the cooperatives. These, in turn, assume the full repayment obligation to CREDICOOP, independently of their own credit relationship with the cooperative members, which are the final beneficiaries.

At the present stage of the program, the cooperatives and CREDICOOP are promptly fulfilling their credit obligations with their respective creditors. Cooperatives's borrowers are also correctly paying their loans.

The delinquency rate from beneficiaries to credit unions is approximately 5%. The institutional delinquency rate is 0% - the credit unions and CREDICOOP pay CONAVI back 100% of the payments due.

I.4. CAPITAL AND PAYMENTS CORRECTION TO SALARY INDEX.

The program corrects loans' capital and payments to the annual or biannual variation of the Minimum Wage Unit (MWU) established by the COP. Variable payments have a maximum limit of 25% of the borrower's income.

This is a mono-indexation mechanism because both elements of the loan are indexed to one parameter, which in this case is the MWU variations. Normally, mono-indexation uses the rate of inflation as the related parameter.

The annexed charts trace the relationship between the MWU and inflation from 1980 to 1993. In the period between 1991 and 1993 the salary index has always been below the rate of inflation.

Therefore, in this three-year period, by applying salary correction, investors have not fully recovered their capital in real terms.

This is an incomplete correction mechanism and, as such, produces capital losses in real terms. However, neither CREDICOOP nor the cooperatives have suffered from its application, because these institutions are not investing their own capital in the operations. It only affects CONAVI which is receiving devaluated guaranies.

I.5. THE NATIONAL HOUSING COUNCIL.

CONAVI was created in 1989 to centralize government housing activity in both the fields of construction and financing of housing units.

CONAVI assumed the housing projects developing functions of the IPVU, (Instituto Paraguayo de Vivienda y Urbanismo), and absorbed the National Housing Bank (NHB), which is the financial and regulatory central organization for the Savings and Loan System. The NHB has now become the financial department of CONAVI.

The creation of CONAVI totally opposes the basic concepts that came out of the United Nations World Housing Congress in Vienna in 1986. The "Vienna Recommendations", in a clear language, state that the government must abandon its traditional role as direct operator in the housing field and become an "enabler".

Under the new approach, the role of government consists in creating the appropriate operational and financial conditions for the operation of a private housing construction and financing system. Governmental institutions have proven to be economically inefficient shelter producers, particularly in inflationary economies. Private sector participation brings business efficiency and new resources to the housing sector.

Private sector institutions must participate, not only with their organizational ability, but also with their money, because to invest in this area is good business. This is the transformation that governments must lead and promote.

CONAVI, in its short existence, has become another example of a government institution going bankrupt by directly building and financing housing units. Instead of allowing for, -and regulating-, private sector participation in this economical activity, CONAVI tried to be the only financier and builder of low cost houses in the country.

Consultant Claude Bovet's report accurately describes the situation. CONAVI has been building, and financing the sale of housing units at zero interest and with a biannual correction to salary of the loans' balances and payments.

This financial scheme could come close to full, real term, capital recuperation, but, CONAVI's collection techniques have produced a delinquency ratio of approximately 95%. In other words, only 5% of the loan recipients repay their debts to CONAVI which has been unable to collect the money it has lent.

CONAVI has 7,500 unfinished housing units with an average price (estimated by CONAVI) of US\$9,000 each. -It seems that the starting point for this estimation was the institution's financial needs-.

CONAVI's authorities are planning to sell 2,500 of those units to developers and S&L Societies to be able to finish the other 4,000 and recover as much of their capital as possible. Additionally CONAVI has commitments for new projects for approximately US\$32 million.

CONAVI has been unable to solve the low-income sector's housing needs and it has kept the private sector out of independent housing construction because they are unable to compete with CONAVI's "gifts".

The GOP budget for 1994 includes Gs. 40,000 million for CONAVI (US\$21 million). This amount is all CONAVI is going to receive in this fiscal year and it won't cover current commitments. It seems that the Central Bank and the Minister of Finance have denied CONAVI any special financial support. Additionally, CONAVI's plan to sell off the unfinished units has not yet been accepted by the potential buyers.

Consultant Claude Bovet's report outlines how CONAVI could be transformed into an institution that functions as a macro-level planner for the urban development and housing sectors.

The first step would be to sell the National Housing Bank to the private sector. The NHB is CONAVI's current source of money to cover its operating expenses. At a meeting with CONAVI's president, Engineer Gustavo Pedrozo, the latter discarded this idea as politically impossible.

At a meeting with Director Luis Breuer of the Central Bank, he accepted the idea as a logical possibility. It seems that the GOP could accept the privatization of the NHB as part of its general privatization plan.

USAID/Rep. and consultants also met with IDB/Rep. for Paraguay on this matter. As Bovet describes in his report, the GOP has entered into a US\$60 million shelter program with IDB.

The program's financial supports consist in US\$ 54 million from the IDB and US\$6 million as local counterpart. The main purposes of the program are:

- a) to create a direct subsidy fund (US\$25 million), and
- b) to establish a refinancing mechanism for mortgage loans granted by private sector institutions to the subsidy program beneficiaries (US\$31 million).

The remaining funds cover a technical assistance component to reinforce the implementation of both mechanisms.

The IDB program is directed to the generation of new homes. It doesn't cover home improvements, which means that the IDB decided to attack the quantitative instead of the qualitative housing deficit.

In this meeting we presented the possibility and convenience of establishing the refinancing mechanism in a private second story bank. This institution could be the National Housing Bank run by the private sector.

We also suggested that this program presents a real opportunity to help reorganize the housing sector. One issue is the elimination of CONAVI's bureaucracy. The other is the transformation of the National Housing Council into the macro-level planner and the manager of the direct subsidy program. This would be a proper role for CONAVI and help address the housing needs.

CONAVI should discard its current organization and create a high quality professional group. The new CONAVI should be able to fulfil its role as the urban development planner and regulator, -always in association with local governments-. The IDB/Rep accepted these ideas and talked about pursuing policy dialogue jointly between the IDB and USAID in the future.

I.6. SAVINGS AND LOAN SOCIETIES.

Currently there are six S&L associations operating in Paraguay. The annexed charts show the consolidated balances (1988-1992) in current value Gs, in Gs of 1988, and in US Dollars. Another chart shows the composition of the loan portfolio of each of the S&L institutions for November 1993.

The most important component of their portfolio is made up of loans for housing acquisition and construction. Housing loans represent 52% of the total portfolio. Productive loans represent 37%. Some of these productive loans are for housing construction purposes. However, CONAVI classifies them as "productive" to be able to charge a 3% commission per loan, instead of the 1% they charge for housing loans.

Loan Portfolio (August 1993):

	Million Gs.	No.
Total Loan Portfolio	105,104	30,904
Housing Loan Portfolio	54,446	6,800
Avg. standing loan:	3.40 (US\$1,870).	
Avg. standing housing loan:	8.01 (US\$4,400).	

The average housing loan allows for the building of a minimum housing unit in Paraguay.

These figures show that S&L average client is at median income level. However, their average housing loan borrower requires a monthly income in the IX decile. This information shows that S&Ls are familiar with low-income loans for below median clients, but not in the housing field.

The final conclusion is that S&L associations could participate in a home improvement loan program, along with cooperatives. Nevertheless, their participation would have to be encouraged through mechanisms such as a refinancing operation.

II. TO EXAMINE THE POSSIBILITIES OF NEW FUNDING SOURCES FOR THE REGIONAL LOW COST SHELTER PROGRAM.

Currently, CONAVI is the only funding source for the low cost program. This institution is going through a very serious financial and structural crisis. Hopefully, it should end in the transformation of CONAVI into a housing authority.

As it was already mentioned in this report, it is not reasonable to expect important credit facilities from CONAVI. Therefore, the most logical move is to try to make the best use of the funds still pending from CONAVI.

II.1. THE PARTICIPATING COOPERATIVES.

The low cost shelter program is financially dependent on CONAVI, with funds going to the cooperatives through CREDICOOP. This institution provides 100% of every loan. The participating cooperatives don't contribute to program funding with their own capital.

CONAVI's loans to CREDICOOP are all the funds available for the program. However, cooperatives should contribute to the program with their own capital in order to increase the total funding and to be a responsible part of the operation. The operation as it is, doesn't involve the cooperatives in the financing of the program.

CONAVI's loans to CREDICOOP are all the funds available for the program. Therefore cooperatives must contribute with their own capital in order to increase the program funding and for them to be a responsible part of the operation.

Consequently, from now on, CREDICOOP should provide an average of 70% of the loans and the respective cooperative, the remaining 30% (average). The individual borrower's savings should be part of the cooperative's contribution.

Additionally, in the future, the loan principal and payments should be corrected to the inflation rate and not to the salary index. This way, both, CONAVI and the cooperatives will fully recover their investment in real terms.

The first section of this report mentions that the median income practically equals the minimum salary. It also mentions that half the population perceives 15.8% of the national income. There is no doubt that the program operates in the lower half and that the MWU is the maximum family income that can be considered for program loans.

Therefore, the amount of each individual cooperative contribution has to be variable. It should be determined according to the different cases and situations.

However, cooperatives must accept that CREDICOOP cannot provide 100% of every program loan. Private sector institutions have to contribute, with their own capital, to the shelter program financial effort.

The last section of this report will analyze the possibility of a new USAID Housing Guaranty Loan. If the analysis proves a new HG loan to be feasible, its implementation would have to include increasing private sector contributions.

Therefore, while special funding sources, such as a new HG-loan, come to be available, the program has to make use of cooperatives's financial capability. The program should promote the cooperatives participation in the capital formation effort necessary to continue the low cost home improvement loan program.

II.2. A REFINANCING MECHANISM.

The other funding source for the low cost shelter program is for the cooperatives and CREDICOOP to refinance their housing portfolios through a refinancing fund.

The purpose of this mechanism is to accelerate the rotation of resources. A higher rotation produces a multiplying factor that increases cooperative fund's efficiency.

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Unfortunately, the housing loans refinancing mechanism the IDB program wishes to implement in CONAVI, doesn't seem to be an immediate option. It would be convenient to determine if the IDB is willing to refinance home improvement loans as part of their program. If they don't, it is something to discuss in future dialogues with the IDB.

Again, if a new HG-loan is implemented in the near future, it should include a refinancing mechanism for **home improvement loans** granted by cooperatives and other financial institutions.

III. GOP INDEXATION SYSTEMS.

Sections I.4. and I.5. of this report refer to the monetary correction using the MWU as point of reference. CONAVI periodically applies salary correction to capital and payments of its loans.

As stated earlier, this is a system of mono-indexation, i.e. it periodically corrects capital and payments to one parameter, in this case the minimum salary index.

This indexation system that only uses salaries as a reference to correct capital and payments, can't guaranty full real term recovery. It becomes a gamble. Sometimes wages increase more than inflation, which means that the lender recuperates and loan repayment accelerates. Yet, there are other periods during which salary stays below the inflation rate and the capital corrected to this parameter losses real value.

The only way to effectively protect the lender is by correcting the invested capital to the variation of the price of money, that is, to inflation. To guarantee a total and timely recuperation it is also necessary to correct payments to inflation.

This method still is a mono-indexation but, instead of using wages as the correction parameter, it uses the price of money as the point of reference for the correction.

It is perfectly acceptable for short term loans such as home improvements loans. However, during the periods of salary lags, payments increase in relation to the borrower's income and payments may become unmanageable for the borrower.

Therefore, loan contracts should include a clause establishing a maximum payment as a percentage of the family's income. The low cost shelter program is currently using 25% of income as the maximum payment.

If a family's income does not keep pace with inflation, in order to not exceed the 25% of income ceiling, the loan period will be extended. Loan contracts should include this possibility.

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III.1. THE DOUBLE INDEXATION METHOD.

The double indexation method is a solution to the monetary distortions brought about by inflation. It is called "double indexation" because the capital of the loan is corrected to inflation and, at the same time, payments are corrected to salary variations.

This method is applicable for median and long term loans (more than five years). Double indexation is based on the fact that the trends income and inflation, over the years fluctuate in an equilibrium. There are years during which salary increases more than inflation and there are other years when salaries loose real value.

Experience has proven that positive years counterbalance negative years and the resulting "real salary" is acceptable for credit purposes. (See annex on Double Indexation).

The relationship between payments and the borrower's income stays constant for the term of the loan. This is a guarantee that payments will never exceed the borrower's paying ability.

The correction of the loan balance to the inflation rate solves the capital recuperation problem from the accounting point of view. However, under inflation, investors will also have to face a cash flow problem.

When salary lags, incompletely corrected payments may produce a shortage of cash recuperation. The solution to this cash flow problem is resolved by double indexation.

During positive periods the investor's collection includes an "extra" recuperation. This additional recuperation should be kept apart, under each borrower's name and earning market rates. The purpose of this reserve is to cover the negative periods, during which salary increases less than inflation.

Paraguayan inflation, for the last 14 years, has kept at an acceptable level. The average inflation for that period is 21.47%. The minimum salary unit has increased at an average of 23.25% during the same period. The real salary average is therefore 101.07%.

These trends allow for a mono-indexation method to function properly, correcting both, capital and payments, to the inflation rate.

However, if real salaries continue to deteriorate, as has been the case in the last three years, a method of double indexation will be needed to maintain the regular flow of long term housing credits.

IV. TO EXAMINE THE FEASIBILITY OF IMPLEMENTING A HOUSING GUARANTY PROGRAM.

Presently, the only source of money the low income shelter activity can expect to have in a near future is the mentioned US\$60 million IDB program. Nevertheless, if the program firmly establishes and respects all conditions precedents referring to structural changes, the implementation process may not be an immediate matter.

Besides all possible obstacles there still is the matter of the IDB program being only directed to new home operations excluding home improvements loans.

In section I.1. of this report appears the information about the 1993 family median income, which has been estimated in 328,000 Gs/month.

Using traditional methods, taking the maximum payment as 25% of the monthly income (82,000 Gs), with a 15-year term, and 28% rate of interest, the maximum loan would be = 3,459,000 Gs. (US\$1,870).

This amount is not enough for a program exclusively oriented to new home loans. It is important to emphasize that this would be the maximum loan if the program has a below median target population.

It is obvious that it would be necessary to implement, at the same time, a direct subsidy program. Direct subsidies are a complement that extends the coverage of low income housing programs. This is an indispensable mechanism to access the extreme poverty level.

Consequently, with the implementation of the IDB program, low income groups with home improvements problems would be left unattended by what seems to be the only source of funds for direct loans. Low income groups, apparently, would also be left without subsidy for home improvements loans.

IV.1. HOME IMPROVEMENTS TARGET POPULATION.

This group represents more than half of the housing deficit of Paraguay. According to the information obtained from the survey, 72.5% of the families have clear property titles. 14.4% of the population has other forms of tenancy that may not be sufficient for mortgage guaranties.

This is a suprising figure for a Latin American country. However, in the 80s a very efficient cadastral and titling program was developed in Paraguay with AID financial support. This may explain the mentioned results. Nevertheless, assuming an improbable 20% error in the survey's results, the number of legal housing owners would still provide sufficient base for mortgage loans in the home improvements area.

The group with other forms of tenancy may use other types of guarantee to back up their loans, such as, salary retention, guarantors and solidary guaranty.

This description shows that there is an ample range for a home improvement loans program. Where there is a home improvement need, there must be a home to improve. Therefore, out of those families that live in their own home it should be possible to develop a portfolio of home improvement loan guarantees, whether mortgage or other.

This portfolio should be capable of sustaining the issuing of housing bonds to sell in the market and refinance the home improvement fund operations. The type of guarantee will influence the estimate of risk and consequently, the amount of negotiable bonds.

Housing Bonds are known in Paraguay but they are far from being common practice. The proposed secondary market based on home improvement loans would be an innovative financial instrument. It could also be an important contribution to the development of a secondary market in Paraguay.

IV.2. FINANCIAL DESCRIPTION.

The following is a schematic description of the financial mechanism that may provide the money for a possible new USAID-HG-Loan to Paraguay. The HG-Loan would be for the amount of US\$10 million.

The Foreign Investor is an American financial institution that grants the US\$10 million loan to the institutional borrower, with USAID's guaranty.

The loan will have a 10-year term and a 4-year grace period. With a rate of interest equivalent to Libor.

The Local Trust Fund is a legal association made up of three local banks, one of them an American Bank authorized to operate in Paraguay (CITIBANK). The principal objective of the Local Trust Fund is to disburse the funds through CREDICOOP. CREDICOOP will on-lend to the individual cooperatives to help them grant home improvements loans to their cooperative members.

Cooperatives' loans to their members will include a minimum of 10% from the cooperative's capital. The program expects that the average cooperative contribution will be 30%.

The Local Trust Fund could also make loans to other local financial institutions, -such as the S&L Societies-, which are willing to comply with program parameters. In these cases the borrowers would directly on-lend to final beneficiaries.

6

A Local Trust Committee will manage the Trust administration. The Foreign Investor will deposit the total amount of US\$10 million in The Trust Fund.

The Trust will disburse the required amounts to CREDICOOP and other approved financial institutions, previous compliance with the operational and financial condition specified in the corresponding Implementation Agreement.

The unused quantities will be invested locally and in the USA, with the purpose of increasing the Trust Fund productivity. The fund's earnings will cover its financial and operational expenses and if possible, increase the Trust Fund availability with the accumulated interest.

Local Trust financial investments will comply with USAID requirements as they appear in the Program Implementation Agreement.

During the first four years the Local Trust will only pay interest to the foreign investor. From the fifth to the tenth year the Local Trust will repay the principal and pay the corresponding interest.

Swap Agreement. The Local Trust Fund and the Central Bank of Paraguay will subscribe a Swap Agreement to guaranty the dollar availability at the dates of payment to the foreign investor.

The Individual Loans. The on-lending institutions will grant home improvements loans to final beneficiaries with a maximum amount of US\$ 3,000. The target population will be the below urban median income families. The loans will have a maximum of 5-year term and a rate of interest equivalent to inflation plus a positive rate.

Periodical Information. The Local Trust Committee will periodically provide USAID/Paraguay and USAID/RHUDO/SA with all required information. Reports will specially cover the Trust Fund financial activities.

The CHF/Rep for Paraguay will attend the meetings of the Local Trust Committee as an advisor and to represent USAID interests.

IV.3. THE REFINANCING FUND.

The Local Trust Fund will separate up to US\$4 million from the external loan to create a Refinancing Fund. The purpose of this fund is to reactivate the existing cooperative and S&L housing portfolios. This mechanism will provide new capital to invest in home improvements loan for the program target population.

The refinancing function implementation may have different approaches. The loan portfolio may be presented as guaranty to back up the loans from the refinancing entity to the primary entity.

Loan portfolios may be sold to the refinancing entity. The third option is for the refinancing entity to secure mortgage bonds issued by primary financial institutions.

The Local Trust will establish the refinancing requirements for the existing housing portfolios. The refinancing facility may also serve new portfolios, made up with the on-lending institutions own capital and in compliance with program requirements.

V. REQUIREMENTS TO ACCESS WORLDWIDE HG AUTHORIZATION.

This program design complies with the requirements for using the Worldwide Authorization.

1. Housing solutions will be affordable to below urban median income families.
2. The proposal will come from the Local Trust.
3. It covers new territory in financing, by the private sector, of the housing needs of the majority of the country's population.
4. The program represents moving into lower-income housing markets not previously served, partially or totally, with their own capital, by banks and other financial institutions.
5. The program privatizes home improvements loans, which is a specific financial function not previously attended by any other sector, except by cooperatives on a small scale.
6. The whole program is based on local financial institutions.
7. The program may contribute to develop the housing bonds secondary market in Paraguay.
8. The program only contact with the government is the Swap Agreement with the Central Bank. There is no doubt that this swap contract would represent an important innovation in the government relationship with the private sector in Paraguay. This is particularly true given the income level of the program target population.

LIST OF INSTITUTIONS AND PERSONS CONTACTED

USAID/PARAGUAY

Richard Nelson, USAID/Representative
Oscar Carvalho, USAID/Project Manager

COOPERATIVE HOUSING FOUNDATION

Todd M. Sorenson CHF/Representative, Paraguay

PEACE CORP

Kristine Vega, Peace Corp/Representative, Paraguay

CONSEJO NACIONAL DE LA VIVIENDA

Eng. Gustavo Pedrozo, President
Ldo. Gerardo García, Director de Finanzas
Dr. Alirio Ugarte Díaz, Director
Arq. Julio Decoud, Director de Proyectos Especiales
Arq. Silvio Ríos, Gerente de Estadísticas y Censos
Arq. Humberto Sandoval, Director Técnico
Dr. Juan Miguel Gorostiaga, Director Jurídico
Arq. Jorge Bosch, Jefe de Gabinete de la Presidencia

BANCO CENTRAL DEL PARAGUAY

Director Luis Breuer

CAMARA PARAGUAYA DE LA CONSTRUCCION

Ing. Moisés G. Cohenca, President
Luis Gonzalez, General Manager

INTERAMERICAN DEVELOPMENT BANK

Jose Agustín Rivero, IDB/Representative

CITIBANK LA ASUNCION

Gustavo Marín, Vice President and General Manager

CREDICOOP

Ing. Agr. Justo Pedro Vera Díaz General Manager
Lic. Teobaldo Araujo, Gerente de Servicios
Financieros

COOPERATIVA DE AHORRO Y CREDITO CREDIVILL Ltda.

Nilda de Noguera, General Manager.

SAVINGS AND LOAN SYSTEM

Guillermo Heisecke, President, Oga Rape S&LS
Roberto Carisimo N., Director, Hogar Propio S&LS
Julio Sauca, General Manager, Hogar Propio S&LS
Pedro Pablo Grance, Executive Director, Progreso
S&LS.

PARAGUAY

STATISTIC DATA

February, 1994

PARAGUAY INCOME DISTRIBUTION 1992

AVERAGE MONTHLY INCOME (Thousand of Gs/Month)

FAMILIES (%)	COUNTRY TOTAL	URBAN TOTAL	METROP. AREA	URBAN OTHER	RURAL ZONE
TOTAL	565.7	756.5	899.8	590.7	327.8
DECILE I	57.3	87.3	124.7	66.2	45.6
DECILE II	124.1	201.9	251.4	157.3	89.2
DECILE III	179.8	276.4	322.4	225.2	127.1
DECILE IV	236.3	344.5	414.0	288.7	159.1
DECILE V	294.6	432.5	505.0	357.0	196.6
DECILE VI	372.2	526.5	612.1	438.8	238.3
DECILE VII	481.3	657.9	766.5	540.5	287.6
DECILE VIII	635.3	844.4	968.7	699.1	365.1
DECILE IX	896.8	1,179.3	1,390.7	956.4	519.7
DECILE X	2,385.6	3,013.3	3,645.2	2,179.9	1,239.3

PARAGUAY INCOME RELATIVE PARTICIPATION (%)

FAMILIES (%)	COUNTRY TOTAL	URBAN TOTAL	METROP. AREA	URBAN OTHER	RURAL ZONE
TOTAL	100	100	100	100	100
DECILE I	1.0	1.2	1.4	1.1	1.4
DECILE II	2.2	2.7	2.8	2.7	2.7
DECILE III	3.2	3.7	3.6	3.8	3.9
DECILE IV	4.1	4.5	4.6	4.9	4.8
DECILE V	5.3	5.6	5.5	6	6
DECILE VI	6.5	7.1	6.8	7.4	7.2
DECILE VII	8.6	8.6	8.7	9.2	8.8
DECILE VIII	11.2	11.3	10.8	11.8	11.1
DECILE IX	15.9	15.5	15.4	16.2	15.7
DECILE X	42.0	39.8	40.4	36.8	38.4

AVERAGE FAMILY SIZE = 4.7

No. OF INCOME PERCEIVERS PER FAMILY = 1.5

MEDIAN INCOME 328,000 Gs./Family/Month 187.45/US\$/ Family/Month

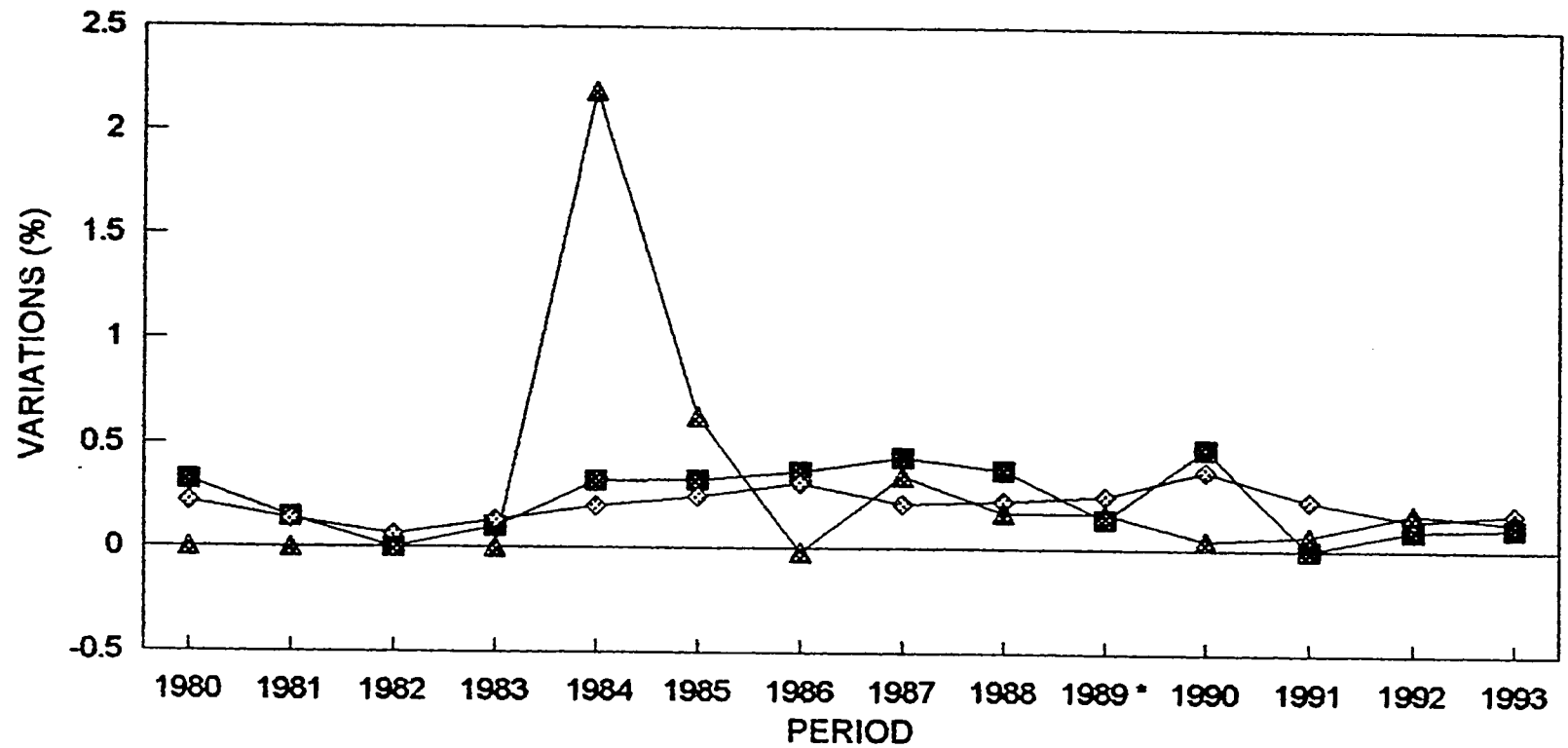
PARAGUAY MINIMUM WAGE UNIT-INFLATION-US DOLAR

YEAR	MWU	INFLATION	US\$	MWU (December)	GDP	US DOLAR
1979				17,820		126.00
1980	32.49%	22.40%	0.00%	23,610	100.0	126.00
1981	14.99%	14.00%	0.00%	27,150	114.0	126.00
1982	0.00%	6.75%	0.00%	27,150	121.7	126.00
1983	10.17%	13.48%	0.00%	29,910	138.1	126.00
1984	32.25%	20.28%	219.05%	39,556	166.1	402.00
1985	32.75%	25.23%	63.35%	52,512	208.0	656.65
1986	37.25%	31.73%	-1.77%	72,072	274.0	645.00
1987	44.00%	21.79%	35.35%	103,783	333.7	873.00
1988	37.94%	23.04%	17.68%	143,160	410.6	1,027.38
1989 *	15.00%	25.96%	17.92%	164,634	517.2	1,211.44
1990	48.78%	38.21%	4.72%	244,950	714.8	1,268.68
1991	0.00%	24.26%	7.08%	244,950	888.2	1,358.50
1992	10.01%	15.12%	18.15%	269,460	1,022.5	1,605.00
1993	11.33%	18.26%	13.79%	300,000	1,209.2	1,826.38
AVG 84-93	26.93%	24.39%	39.53%			
ÁVG 90-93	17.53%	23.96%	10.94%			

* NOTE: the dolar free market began operations in 1989.

PARAGUAY

MWU-INFLATION-US DOLAR



■ MWU ◆ INFL. ▲ US\$

PARAGUAY

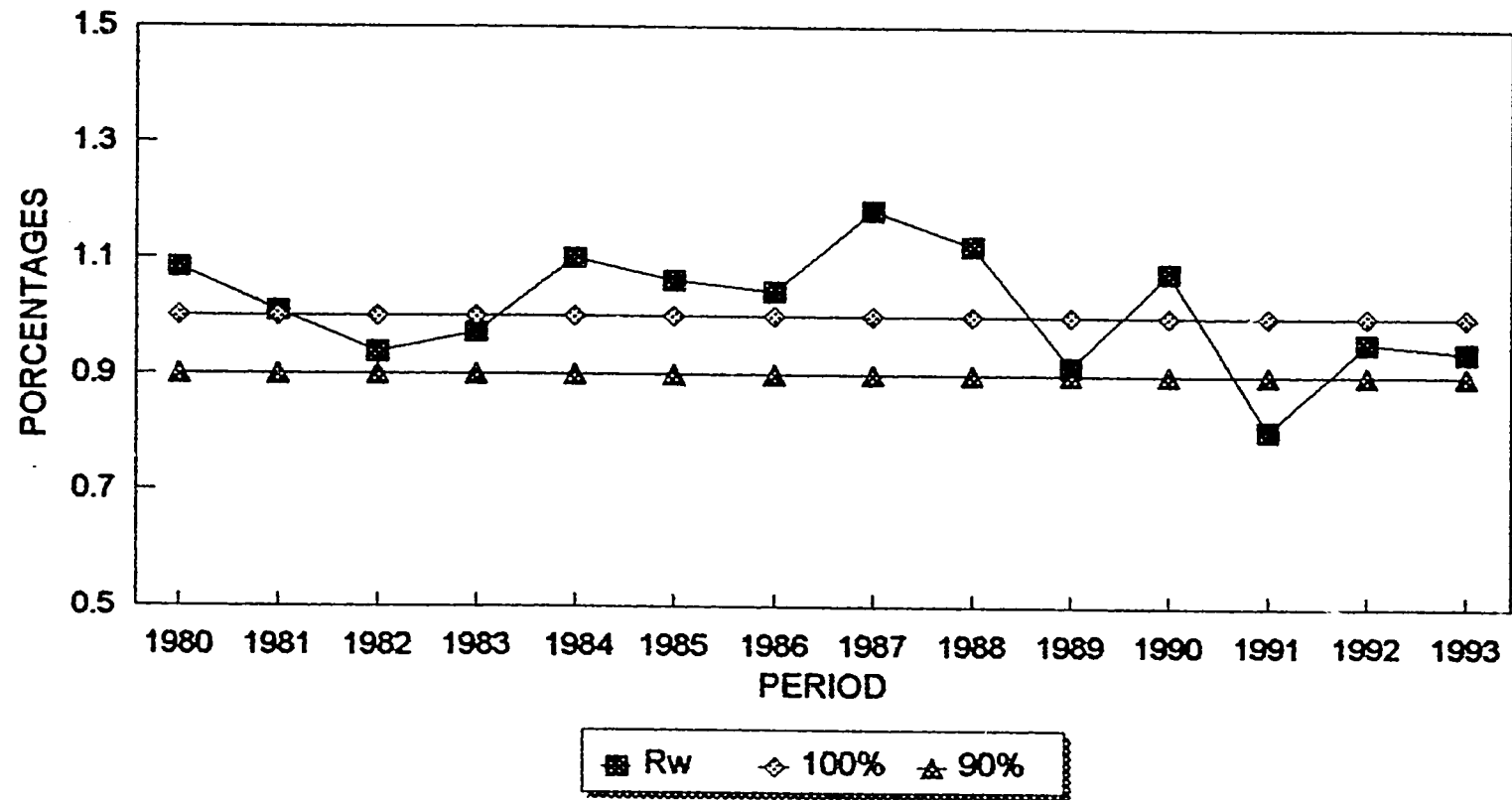
INCOME/INFLATION

YEAR	Rs	Ref.1	Ref.2	VAR. M.W.U.	INFLATION	M.W.U. (Diciembre)
1979						17,820
1980	108.24%	100.00%	90.00%	32.49%	22.40%	23,610
1981	100.87%	100.00%	90.00%	14.99%	14.00%	27,150
1982	93.67%	100.00%	90.00%	0.00%	6.75%	27,150
1983	97.08%	100.00%	90.00%	10.17%	13.48%	29,910
1984	109.96%	100.00%	90.00%	32.25%	20.28%	39,556
1985	106.01%	100.00%	90.00%	32.75%	25.23%	52,512
1986	104.19%	100.00%	90.00%	37.25%	31.73%	72,072
1987	118.24%	100.00%	90.00%	44.00%	21.79%	103,783
1988	112.11%	100.00%	90.00%	37.94%	23.04%	143,160
1989	91.30%	100.00%	90.00%	15.00%	25.96%	164,634
1990	107.65%	100.00%	90.00%	48.78%	38.21%	244,950
1991	80.48%	100.00%	90.00%	0.00%	24.26%	244,950
1992	95.56%	100.00%	90.00%	10.01%	15.12%	269,460
1993	94.14%	100.00%	90.00%	11.33%	18.26%	300,000
AVG	101.07%					

Sources: International Monetary Fund
Central Bank of Paraguay

PARAGUAY

INCOME/INFLATION



SAVINGS AND LOAN SOCIETIES

CONSOLIDATED BALANCES (Million Gs. Nominal Values)

	1988	1989	1990	1991	1992	Nov. 1993
ASSETS	65,527	82,321	98,974	140,468	169,932	211,051
Banks	9,405	12,299	12,548	40,225	40,165	66,913
Legal Reserve	2,265	2,912	570	2,952	4,441	6,307
VEIS (Bonds)	0	0	3,030	3,130	3,130	3,130
Loans	47,022	60,442	73,612	82,034	97,563	114,078
LIABILITIES	62,812	78,672	92,684	131,610	157,375	195,662
Savings	61,793	77,272	91,627	130,378	154,128	189,481
PATRIMONY	2,714	3,648	6,310	8,858	12,558	15,353
 GDP	 410.6	 517.2	 714.8	 888.2	 1,022.5	 1,209
Ratio	1	1.26	1.74	2.16	2.49	2.94

CONSOLIDATED BALANCES (Million Gs. of 1988)

ASSETS	65,527	65,354	58,853	64,938	68,239	71,885
Banks	9,405	9,764	7,208	18,595	16,129	22,721
Legal Reserve	2,265	2,312	327	1,365	1,783	2,142
VEIS (Bonds)	0	0	1,741	1,447	1,257	1,063
Loans	47,022	47,984	42,285	37,923	39,176	38,737
LIABILITIES	62,812	62,457	53,229	60,841	63,196	66,440
Savings	61,793	61,345	52,633	60,272	61,892	64,341
PATRIMONY	2,714	2,896	3,625	4,095	5,043	5,213

PARAGUAY SAVINGS AND LOAN SOCIETIES

CONSOLIDATED BALANCES (Million Gs. Nominal Values)

	1988	1989	1990	1991	1992	Nov 1993
ASSETS	65,527	82,321	98,974	140,468	169,932	211,051
Banks	9,405	12,299	12,548	40,225	40,165	66,913
Legal Reserve	2,265	2,912	570	2,952	4,441	6,307
VEIS (Bonds)	0	0	3,030	3,130	3,130	3,130
Loans	47,022	60,442	73,612	82,034	97,563	114,078
LIABILITIES	62,812	78,672	92,664	131,610	157,375	195,662
Savings	61,793	77,272	91,627	130,378	154,128	189,481
PATRIMONY	2,714	3,648	6,310	0,858	12,558	15,353
 Gs/US\$	 1,027.38	 1,211.44	 1,268.68	 1,358.50	 1,605.00	 1,826.38

CONSOLIDATED BALANCES (Million US DOLAR)

ASSETS	63.78	67.95	78.01	103.40	105.88	115.56
Banks	9.15	10.15	9.89	29.61	25.02	36.64
Legal Reserve	2.20	2.40	0.45	2.17	2.77	3.45
VEIS (Bonds)	0.00	0.00	2.39	2.30	1.95	1.71
Loans	45.77	49.89	58.02	60.39	60.79	62.46
LIABILITIES	61.14	64.94	73.04	96.88	98.05	107.13
Savings	60.15	63.79	72.22	95.97	96.03	103.75
PATRIMONY	2.64	3.01	4.97	6.52	7.82	8.41

PARAGUAY**SAVINGS AND LOAN SOCIETIES
November 1993****LOAN PORTFOLIO (Million Gs)**

	PROGRESO	HOGAR PROPIO	AHORROS PARAG.	ITAPUA	OGA RAPE	SOLAR	CONSOLDT.	%
TOTAL	7,519	13,046	47,389	11,169	23,114	11,841	114,078	100.00%
Housing	3,870	8,989	21,542	5,681	11,287	8,195	59,563	52.21%
Production	794	3,945	21,197	5,140	8,445	3,162	42,683	37.42%
Other	2,709	3	2,185	65	3,355	57	8,374	7.34%
Delinquency	146	132	2,580	283	27	362	3,531	3.10%
Provisions	0	-23	-114	0	0	-128	-265	

Gs/DOLAR 1,826

LOAN PORTFOLIO (MILLION US DOLAR)

	PROGRESO	HOGAR PROPIO	AHORROS PARAG.	ITAPUA	OGA RAPE	SOLAR	CONSOLDT.	%
TOTAL	4.12	7.14	25.95	6.12	12.66	6.48	62.46	100.00%
Housing	2.12	4.92	11.79	3.11	6.18	4.49	32.61	52.21%
Production	0.43	2.16	11.61	2.81	4.62	1.73	23.37	37.42%
Other	1.48	0.00	1.20	0.04	1.84	0.03	4.59	7.34%
Delinquency	0.08	0.07	1.41	0.15	0.01	0.20	1.93	3.10%
Provisions	0.00	(0.01)	(0.06)	0.00	0.00	(0.07)	(0.15)	

HOUSING FINANCE UNDER INFLATION

I. INTRODUCTION.

Traditional housing finance methods require stable economic conditions. They served their purpose while steady premises existed. Inflation altered the stability of all economical premises and therefore rendered traditional methods inadequate for housing finance.

Housing credits are based on the stability of currency value and of the borrower's income. To bring private investors into shelter financing activities, rates of interest must be positive, which means higher than inflation.

Positive rates allow for full real term recuperation of investments and for a reasonable profit.

In traditional formulas, the higher the interest rate, the bigger the payments. On the other hand, if payments are kept at a reasonable level, the amount of the loan becomes insufficient for housing acquisition purposes.

When inflation is still at an acceptable level, it is typical to try to confront it by means of the application of variable interest rates to the same classical formulas.

This mechanism allows for full recuperation because it corrects the capital against inflation. However, the borrower's income is not corrected and during periods in which salary increases are lower than inflation, payments may become unmanageable for the borrower.

In an inflationary environment, shelter problems have no solution by means of traditional methods. Under inflation, the best shelter production systems, such as those in Chile, Costa Rica or Colombia, may fail if inflation reaches and stays at high level for a time.

Currency's progressive loss of value erodes the ability to confront the problem and eventually halts the whole housing production mechanism.

II. SOLUTIONS.

Inflation implies variable economical premises. Under these conditions credit analysis requires new methods and new financial principles. The inflationary phenomenon is a universal problem. It affects the whole economy but housing finance, due to its nature, (long term loans), is usually the most affected sector.

In 1988, a World Bank team led by Consultant Robert Buckley developed a housing finance method that solves most of the practical problems derived from inflation.

This method is called Double Indexation because it corrects the capital of the loans against inflation and payments to the salary index.

In an inflationary environment the principle for credit analysis is the relationship between SALARY and INFLATION (real salary).

Housing finance double indexation systems have been set up in Mexico and Turkey and are successfully operating for low income housing production and financing.

In 1990, USAID's Regional Housing and Urban Development Office for South America (RHUDDO/SA) complemented this method with the calculation of the borrower's DEBT CAPACITY. The loan is not an arbitrary sum. It should always be within the borrower's paying ability. Therefore the maximum loan should be equal to, or lower than, the borrower's capacity to service the debt.

The borrower's debt capacity depends on the relative performance of salary and inflation during the term of the loan. It would be impossible to extrapolate the individual performance of salary and inflation for the next 10 or 15 years. However, it is possible to estimate the relative performance of both parameters for the term of the loan. The application of a safety margin reduces the investor's risk in double indexation credits.

In traditional housing finance the normal approach is to start from the price of the house. The amount of the loan is equal to the selling price minus the down payment. Then the lender analyzes the borrower's paying ability to determine if he can pay for that loan.

Under inflation, the variability of the parameters makes it necessary to change the way credit analysis is approached. The first step is to figure out the borrower's paying capacity, (eg. 25% of income). This information makes it possible to calculate the maximum loan amount, which will finally decide the shelter product that a particular borrower can acquire.

Double Indexation is a viable response to a series of problems that derive from inflation. The following problems must be solved satisfactory and simultaneously:

1. It is necessary to guarantee lenders' recuperation in real terms. This is done by periodically readjusting the capital of the loan to the inflation rate.
2. The method must protect the borrower's paying ability by establishing payments as a fixed percentage of the borrower's income.
3. The borrower's debt capacity should be a function of the family's ability to pay.

The only possible solution to the problem of long term credits in an inflationary environment is to break the connection between the rate of interest and the payments. Consequently, in double indexation, the rate of interest varies with inflation and payments vary accordingly to salary increases.

Double indexation is conceptually acceptable because salary increases closely follow the variations of the inflation rate. To prove this assertion this report investigates the salary and inflation series, during approximately the same period, in ten Latin American countries.

The results of the analysis appear in the following chart:

Country	Rw (%)	Period
Bolivia	102	75-88
Colombia	105	76-89
Costa Rica	100	80-91
Chile	98	75-89
Ecuador	97	75-91
Guatemala	98	75-88
Paraguay	101	80-93
Peru	94	75-88
Uruguay	95	74-90
Venezuela	94	76-93

III. FORMULAS AND MATHEMATICAL EXPRESSIONS.

Rw expresses the relationship between the salary and inflation series.

Dw = average of salary variations during the period;
 Inf = average inflation for the period;
 $(1+Dw)$ = mathematical ratio of the salary series;
 $(1+Inf)$ = mathematical ratio of the inflation series;

$Rw = (1+Dw)/(1+Inf)$ = real salary;

Total Recuperation = Sum of Payments.

P_1 = first year payment = fixed percentage of borrowers' income;

$\Sigma(\text{payments}) = P_1 \cdot Rw + P_1 \cdot Rw^2 + \dots + P_1 \cdot Rw^n$

$RECUPERATION = P_1 \cdot Rw \cdot ((1 - Rw^n)/(1 - Rw))$

Debt Capacity $\leq \Sigma(\text{payments})$.

The difference between the recuperation and the loan is the investor's profit.

The calculation of the borrower's Debt Capacity requires a new parameter: R_i = rate of interest to allow for total recuperation and a reasonable profit.

Int = rate of interest;
 Inf = rate of inflation;

$R_i = (1+Int)/(1+Inf)$ = real interest rate;

The introduction of the new parameter changes the series of payments. The accumulation of the corrected payments equals the maximum Debt Capacity.

$DEBT\ CAPACITY = P1 * (Rw/R_i) * ((1 - (Rw/R_i)^n) / (1 - (Rw/R_i)))$.

The rate of interest may have three possible values:

1. $Int > Inf$.
 $R_i > 1$. Decreases the amount of the loan and makes it lower than recuperation;
2. $Int = Inf$.
 $R_i = 1$. Makes the amount of the loan equal to the recuperation (no profit);
3. $Int < Inf$.
 $R_i < 1$; increases the amount of the loan and makes it bigger than possible recuperation.

NOTE: The formula works with yearly payments and inflation rates. Inflation is a continuous phenomenon but salaries normally increase once a year. If this frequency is accelerated, the formula would gain in accuracy.

IV. SAFETY FACTOR.

The value of Rw is the key element in the calculation of the borrower's debt capacity. The correct estimation of the real salary (Rw) for the period is the most important issue in the application of the double indexation method.

The annexed tables and corresponding graphs show that there are "positive" and "negative" years in the analyzed period, that is, years in which salary increased more or less than inflation. The method is based on the theory that positive years counterbalance negative ones. The average Rw shows how well compensation maintains its real value during the analyzed period for each country.

A possible Safety Factor consists in lowering the value of Rw . Double indexation formulas show that the amount of the loan is directly proportional to the value of Rw . Which means that the lower Rw is, the smaller the amount of the loan will be.

Annexed graphs show the variations of income as a percentage of inflation. In countries with R_w well below the average inflation rate negative areas (below the horizontal) are clearly greater than positive ones (over the horizontal). If calculations use a lower value of R_w , (eg. 90%) the positive areas will always be greater than the negative ones.

To diminish the value of R_w , graphically, means to lower the horizontal line (ref=100%) that serves as reference in the graphs.

V. ADDITIONAL GUARANTIES.

Normally, primary housing finance institutions, private and public, should use double indexation to create mortgages portfolios readjusted to inflation.

Government institutions should not be operators in the housing sector. Instead the Government is responsible for the creation of adequate conditions to allow for the incorporation of private institutions to the solution of shelter problems.

Private institutions should be the housing sector operators. They must incorporate their expertise, organizational ability and resources.

The government may collaborate with Housing Finance Insurance as part of creating adequate conditions. Beside mortgage insurance and borrower's life insurance, it could be convenient to provide a "recuperation guaranty".

This type of insurance would cover for the possible failure of full recuperation of the invested capital by means of the double indexation method.

If the value of R_w is properly estimated, the need for this extra guaranty is very remote. However, given the absence of precedents, this mechanism would eliminate any doubts that the private sector institutions could have.

VI. COMPENSATION FUND.

The most important problem that may originate in the double indexation method is for the investor to recuperate in a certain period less than the amount originally expected, due to the negative year effect. This situation may produce cash flow difficulties.

The solution comes from the nature of the double indexation method itself. In positive years, real income is higher than average and the borrower makes prepayments.

35

This surplus should be kept apart and be registered on individual savings accounts of current borrowers, earning market rates. And its purpose is to compensate for the negative year effect and a possible cash flow deficit during those periods.

VII. ADDITIONAL OBSERVATIONS.

The application of the double indexation method requires the permanent use of economic indexes. These guiding values should be sufficient, reliable and available on a timely basis.

Experience has proven that inflation is not the important factor, rather, it is maintaining the buying power needed to acquire the goods and services people require. That buying power depends on the performance of the real salary index.

Values of R_w are normally within manageable terms. Over the long term, the final average is always acceptable. The reason for this is that salaries increase, even if society's leaders don't have a precise picture of all the involved economic principles.

The minimum limit for R_w is not a mathematical issue, but a sociological and political one.

In the chart designated as Financing under Inflation, the results of the application of the double indexation method are shown for different values of R_w and inflation rates. The smallest value in chart No.1 is 70%.

In this particular case, this value is the result of the combination of an average inflation of 50% and a salary increase average of 5% for 15 years.

Obviously, this is just a theoretical exercise for clarification purposes. In real life that combination is not possible. A country's citizens would not tolerate an average inflation of 50% added to an average salary increase of 5%, during a period of 15 years.

VIII. READJUSTED LONG TERM BONDS.

The existence of readjusted portfolios allows for the issuing of readjustable long term housing bonds. This is the best answer to housing finance in any economy, and especially under inflation. It means the perfect equilibrium between readjusted assets and liabilities.

Long term savings require monetary correction. But more importantly, they require positive economic expectations. Many factors may influence people's expectations, but the determining one is for the economy to grow.

7/6

Besides solving a social problem, the housing construction industry, is very efficient as an employment generator. When its efforts are mainly directed to low income groups, which is the largest component of most countries' population, it is also a very capable distributor of wealth.

Application of the double indexation method under inflation recuperates normal housing credit flow, lost due to inflation. To return to normal levels of operation means significant improvements to production and productivity and those effects are anti-inflationary.

Inflation corrected housing bonds are also anti-inflationary and added to double indexation, produce the necessary funds to keep the required financial equilibrium between housing finance assets and liabilities.

PARAGUAY

DOUBLE INDEXATION

February, 1994

TILT EFFECT

TRADITIONAL LOAN
 INCOME = 720,000 per year
 LOAN = 1,000,000

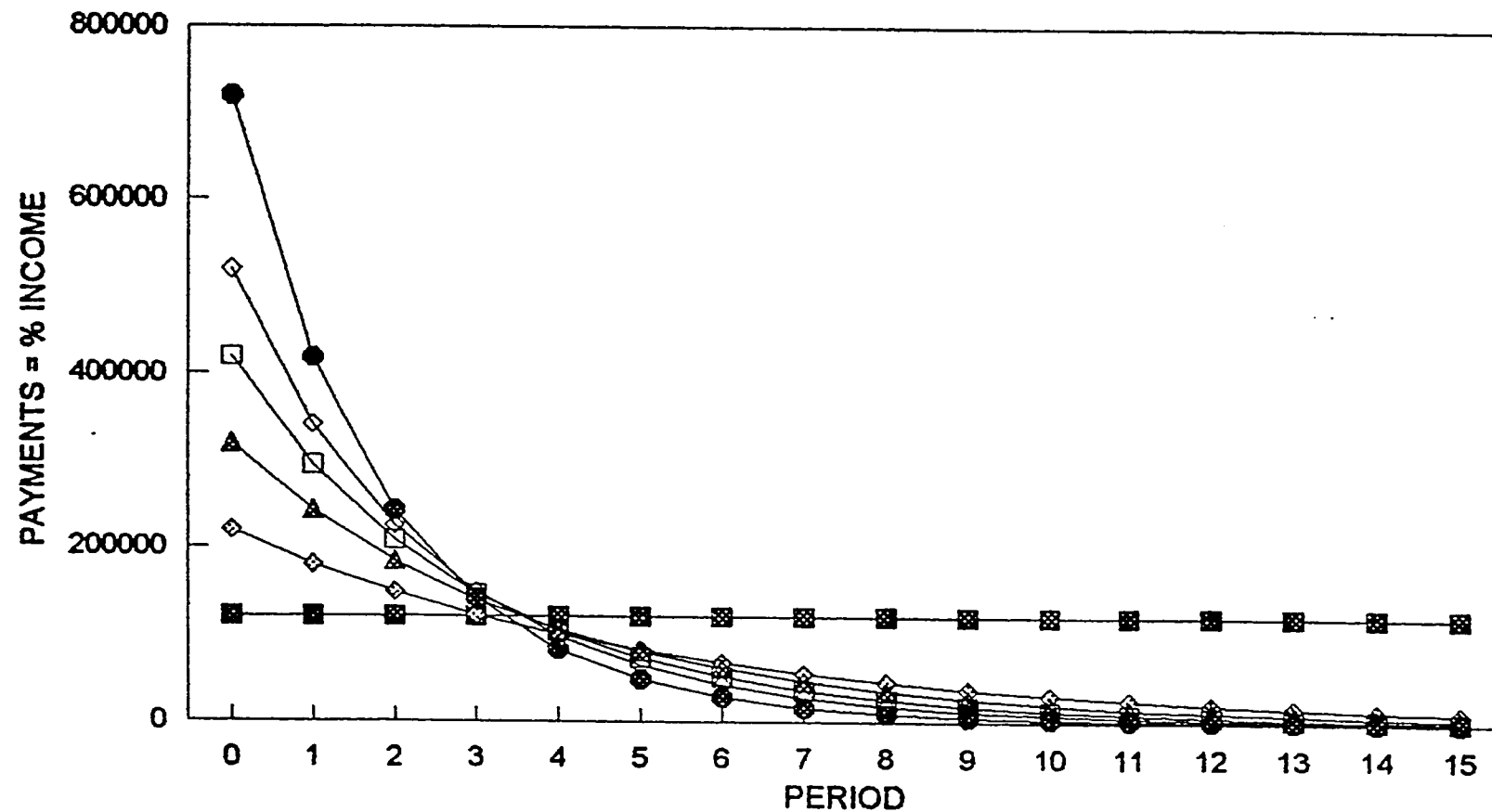
Positive Rate = 12%
 Term = 180
 Payments = 120,000

INFLATION	INTEREST	PAYMENTS	PAYMENTS AS % INCOME
0%	12%	120,000	17%
10%	22%	220,000	31%
20%	32%	320,000	44%
30%	42%	420,000	58%
40%	52%	520,000	72%
50%	62%	620,000	86%
60%	72%	720,000	100%

Años	N.P.V. INFL. = 0%	N.P.V. INFL. = 10%	N.P.V. INFL. = 20%	N.P.V. INFL. = 30	N.P.V. INFL. = 40%	N.P.V. INFL. = 50%	N.P.V. INFL. = 60%
0	120,000	220,000	320,000	420,000	520,000	620,000	720,000
1	120,000	180,328	242,424	295,775	342,105	382,716	418,605
2	120,000	147,810	183,655	208,292	225,069	236,244	243,375
3	120,000	121,156	139,132	146,685	148,072	145,830	141,497
4	120,000	99,308	105,403	103,299	97,416	90,018	82,266
5	120,000	81,400	79,851	72,746	64,089	55,567	47,829
6	120,000	66,721	60,493	51,229	42,164	34,301	27,807
7	120,000	54,689	45,828	36,077	27,739	21,173	16,167
8	120,000	44,827	34,718	25,406	18,250	13,070	9,400
9	120,000	36,744	26,302	17,892	12,006	8,068	5,465
10	120,000	30,118	19,926	12,600	7,899	4,980	3,177
11	120,000	24,687	15,095	8,873	5,197	3,074	1,847
12	120,000	20,235	11,436	6,249	3,419	1,898	1,074
13	120,000	16,586	8,663	4,400	2,249	1,171	624
14	120,000	13,595	6,563	3,099	1,480	723	363
15	120,000	11,144	4,972	2,182	974	446	211

TILT EFFECT

TRADITIONAL METHOD



■ INFL. = 0% ◇ INFL. = 10% ▲ INFL. = 20% □ INFL. = 30 ◇ INFL. = 40% ● INFL. = 60%

BOLIVIA**INCOME/INFLATION**

YEAR	Rw	REF.1	REF.2	INCOME	INFLATION
75	107%	100%	90%	18%	10%
76	119%	100%	90%	24%	4%
77	103%	100%	90%	11%	8%
78	100%	100%	90%	11%	10%
79	99%	100%	90%	18%	20%
80	95%	100%	90%	39%	47%
81	91%	100%	90%	21%	32%
82	99%	100%	90%	120%	124%
83	111%	100%	90%	315%	276%
84	138%	100%	90%	1805%	1281%
85	63%	100%	90%	7394%	11750%
86	101%	100%	90%	281%	276%
87	107%	100%	90%	18%	10%
88	119%	100%	90%	43%	20%

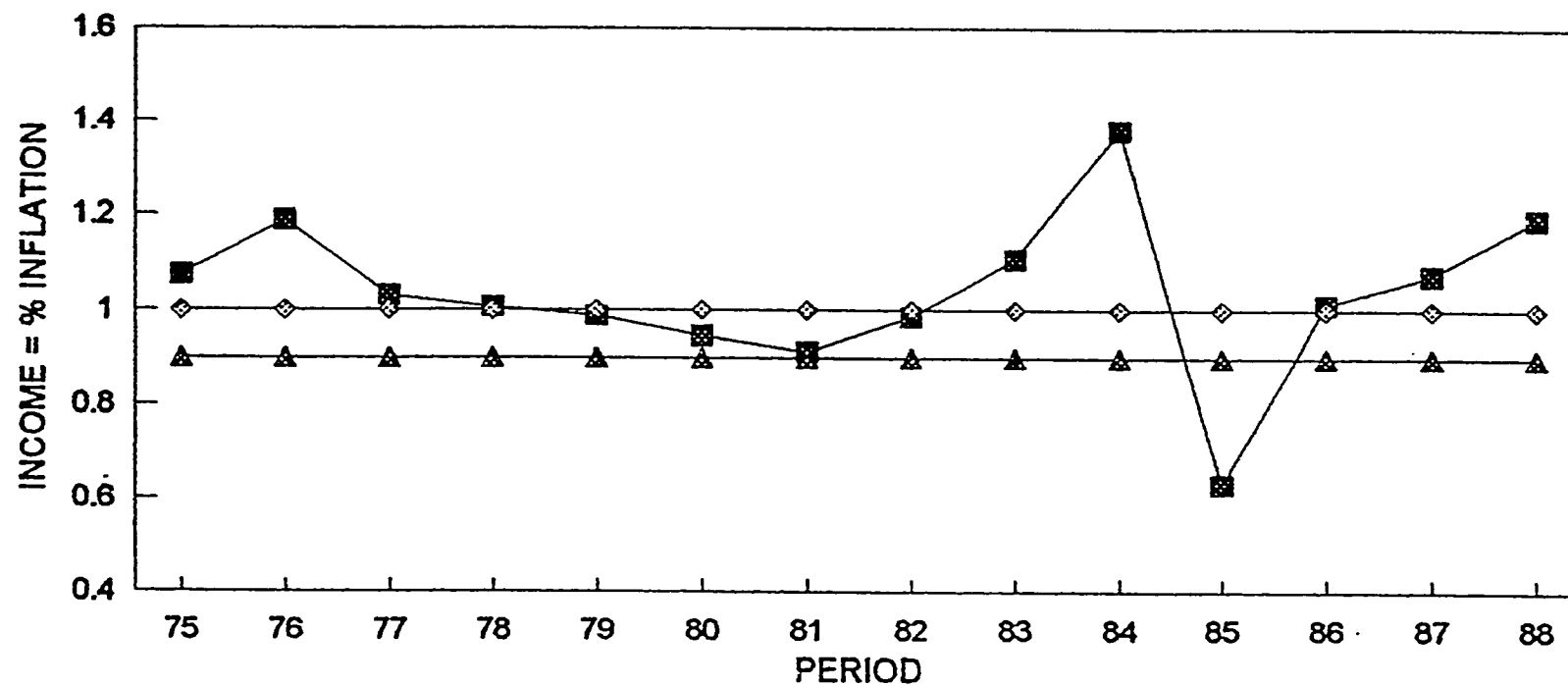
AVG 722.76% 991% 104%

STD 3002%

$(1+Dw) = (u/a)^{(1/n-1)} =$ 1.0548
 $(1+Inf) =$ 1.0000
 $Rw = (1+Dw)/(1+Inf)$ 105.48%

BOLIVIA

INCOME/INFLATION



■ Rw ◇ 100% ▲ 90%

COLOMBIA

INCOME/INFLATION

YEAR	Rw	REF.1	REF.2	INCOME	INFLATION
76	113%	100%	90%	42%	26%
77	114%	100%	90%	47%	29%
78	114%	100%	90%	34%	18%
79	122%	100%	90%	57%	29%
80	106%	100%	90%	33%	26%
81	100%	100%	90%	26%	26%
82	107%	100%	90%	32%	24%
83	107%	100%	90%	25%	17%
84	109%	100%	90%	29%	18%
85	98%	100%	90%	20%	23%
86	95%	100%	90%	24%	30%
87	98%	100%	90%	22%	24%
88	98%	100%	90%	25%	28%
89	101%	100%	90%	27%	26%
AVG	106%			31%	24%

$$\begin{aligned} (1+Dw) &= 1.3053 & Dw &= 30.53\% \\ (1+Inf) &= 1.2437 & Inf &= 24.37\% \end{aligned}$$

$$Rw = (1+Dw)/(1+Inf) = 104.95\%$$

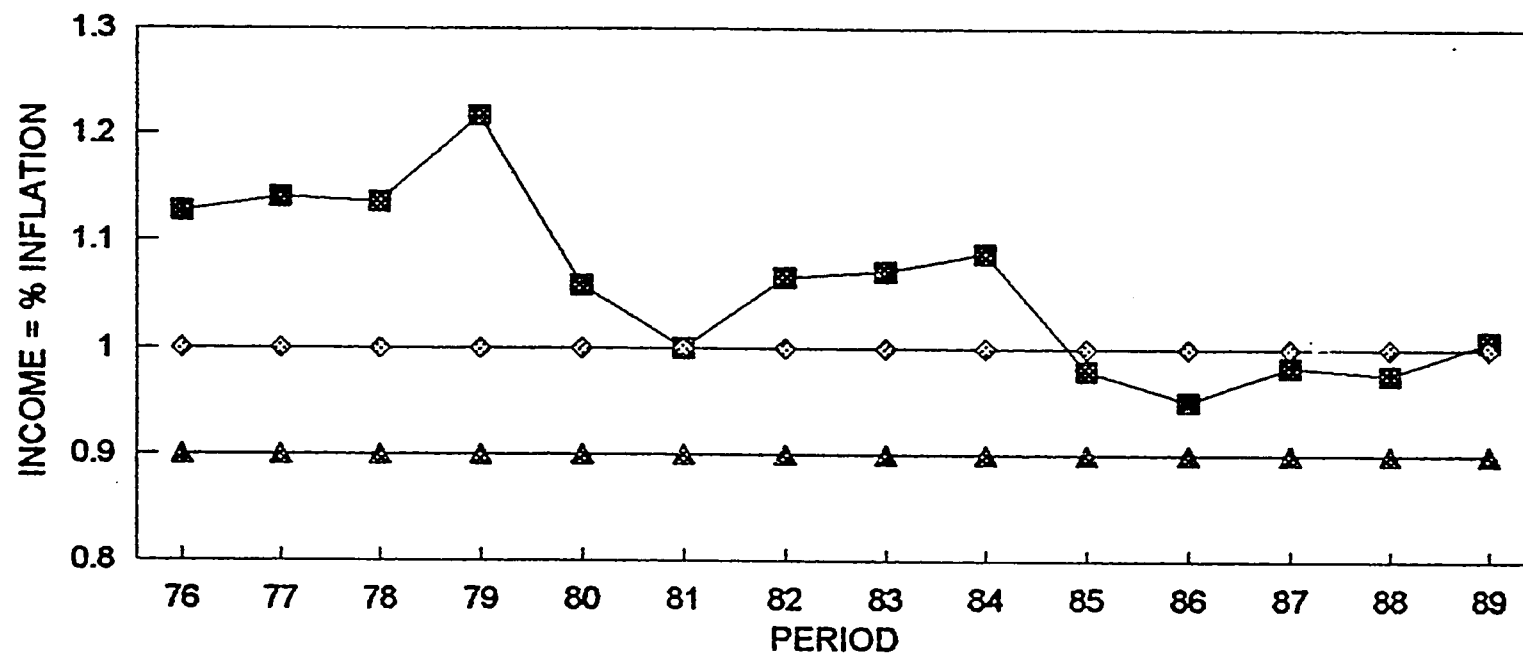
(Beginning of Period)

$$\text{RECUPERATION} = P1 * Rw * ((1 - Rw^n) / (1 + Rw))$$

$$\text{DEBT CAPACITY} = P1 * (Rw/Ri) * ((Rw/Ri)^n - 1) / ((Rw/Ri) - 1)$$

COLOMBIA

INCOME/INFLATION



■ Rw ◇ 100% ▲ 90%

COSTA RICA

INCOME/INFLATION

YEAR	Rw	REF.1	REF.2	INCOME VARIATION	INFLATION	MINIMUM SALARY	CPI
1979						26.30	158.30
1980	80.69%	100%	90%	33.19%	65.07%	35.03	261.30
1981	108.11%	100%	90%	96.49%	81.75%	68.83	474.90
1982	119.24%	100%	90%	31.99%	10.70%	90.85	525.70
1983	98.52%	100%	90%	15.61%	17.35%	105.03	616.90
1984	107.21%	100%	90%	18.92%	10.93%	124.90	684.30
1985	98.58%	100%	90%	13.80%	15.43%	142.13	789.90
1986	94.87%	100%	90%	10.46%	16.43%	157.00	919.70
1987	92.81%	100%	90%	16.32%	25.33%	182.63	1,152.70
1988	109.35%	100%	90%	20.23%	9.95%	219.58	1,267.40
1989	97.49%	100%	90%	24.06%	27.25%	272.40	1,612.80
1990	97.20%	100%	90%	21.81%	25.32%	331.80	2,021.10

AVG 100.37% 27.53% 27.77%

(1+Ds) = 1.2753

(1+Ifi) = 1.2777

Rw = (1+Ds)/(1+Ifi) = 99.81%

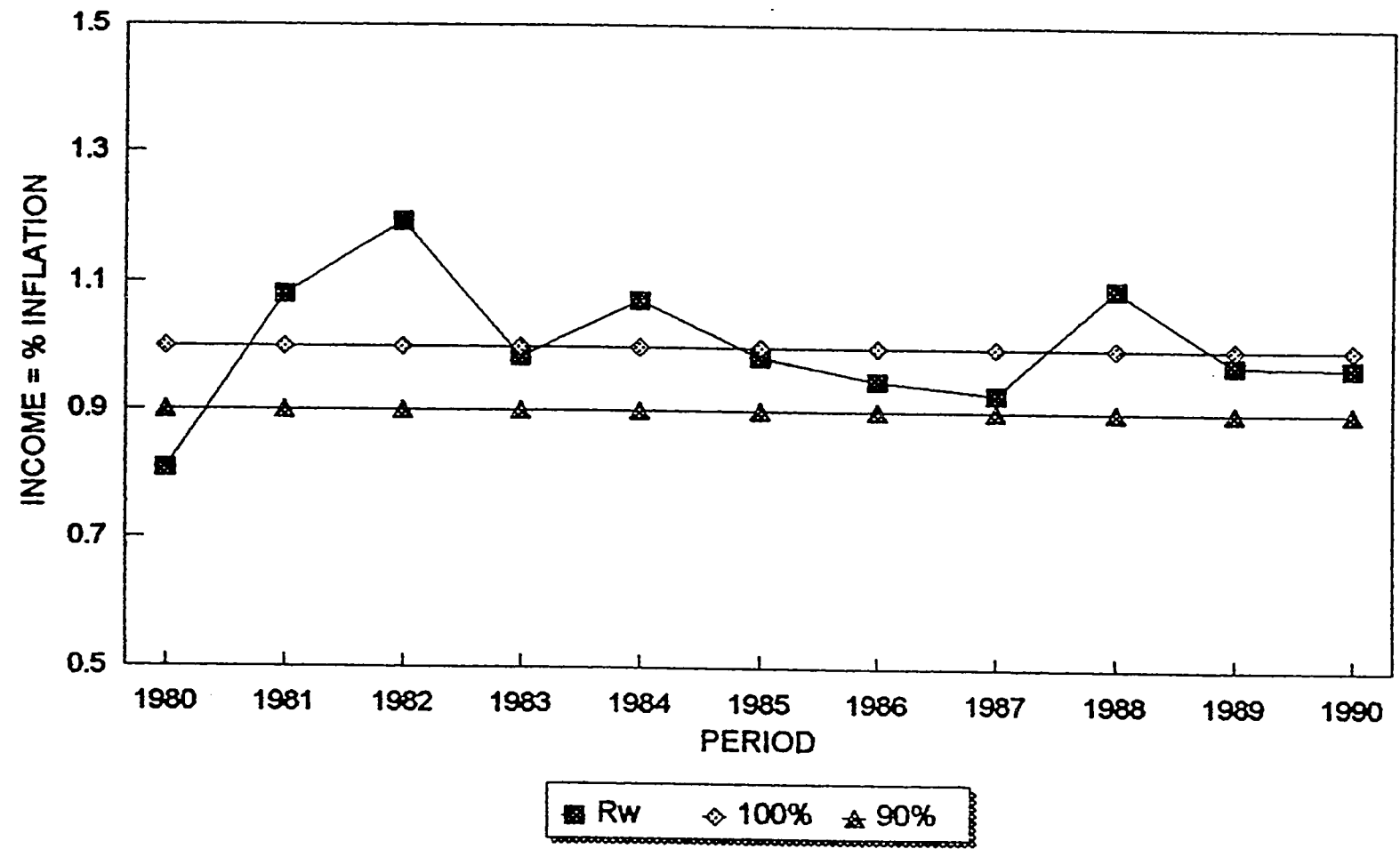
RECUPERATION

$P1 \cdot Rw \cdot (1 - Rw^n) / (1 - Rw)$

95.24

COSTA RICA

INCOME/INFLATION



ECUADOR

INCOME/INFLATION

YEAR	Rw	REF.1	REF.2	INCOME	INFLATION
1976	98%	100%	90%	12%	14%
1977	107%	100%	90%	18%	10%
1978	89%	100%	90%	0%	13%
1979	92%	100%	90%	4%	13%
1980	120%	100%	90%	32%	10%
1981	171%	100%	90%	92%	13%
1982	87%	100%	90%	0%	15%
1983	109%	100%	90%	25%	15%
1984	79%	100%	90%	17%	48%
1985	95%	100%	90%	24%	30%
1986	102%	100%	90%	31%	28%
1987	110%	100%	90%	35%	23%
1988	91%	100%	90%	19%	30%
1989	95%	100%	90%	51%	59%
1990	81%	100%	90%	43%	76%
1991	73%	100%	90%	9%	49%
1992	91%	100%	90%	35%	49%
AVG	99%			26%	29%

$$(1+Dw) = (u/a)^{(1/n-1)}$$

1.2539

$$Dw = 25.39\%$$

$$(1+Inf) = (u/a)^{(1/n-1)}$$

1.2862

$$Inf = 28.62\%$$

$$Rw = (1+Dw)/(1+Inf) =$$

97.49%

(Beginnig of Period)

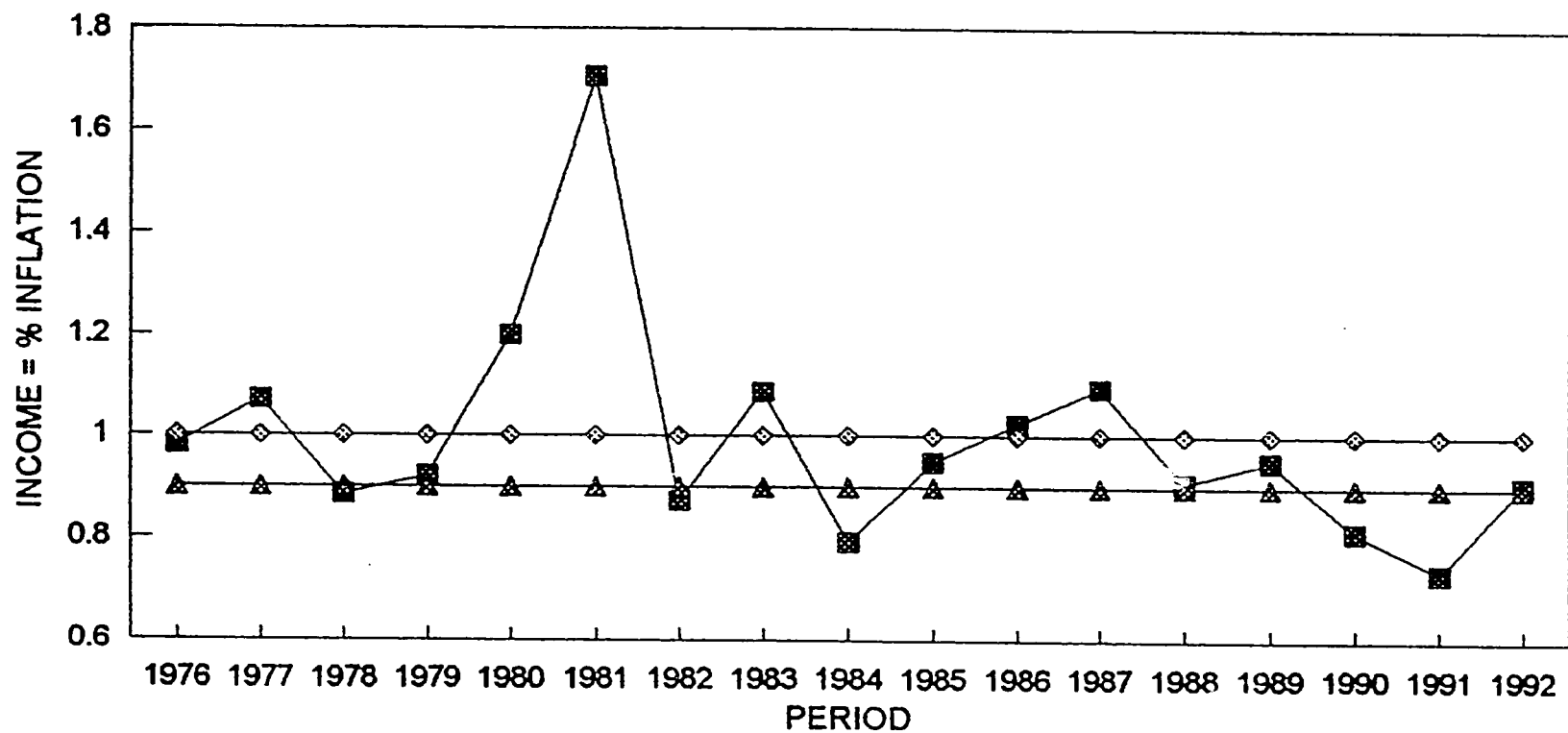
$$RECUPERATION = P1 \cdot Rw \cdot (1 - Rw^n) / (1 - Rw)$$

(End of Period)

$$RECUPERATION = P1 \cdot (1 / (1 + Inf)) \cdot (1 - Rw^n) / (1 - Rw)$$

ECUADOR

INCOME/INFLATION



■ Rw ◇ 100% ▲ 90%

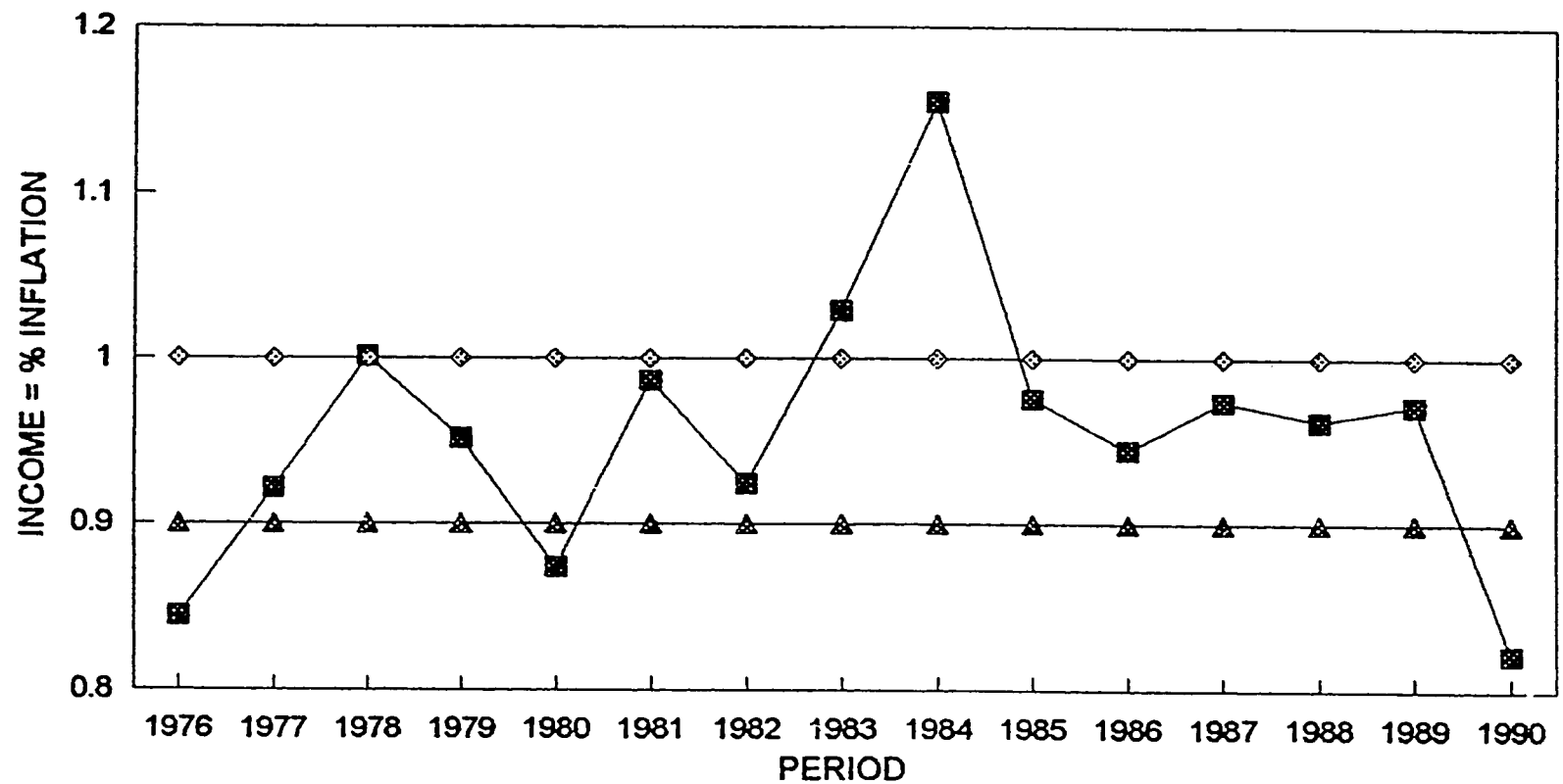
URUGUAY (BASE= MARCH 1973) INCOME/INFLATION

YEAR	Rw	REF.1	REF.2	INCOME VAR.	INFLATION	SALARY	CPI
1973							118.8
1974					77.19%	120.0	210.5
1975	94.19%	100%	90%	70.83%	81.38%	205.0	381.8
1976	84.43%	100%	90%	27.20%	50.65%	260.8	575.2
1977	92.13%	100%	90%	45.73%	58.19%	380.0	909.9
1978	100.13%	100%	90%	44.74%	44.54%	550.0	1,315.2
1979	95.19%	100%	90%	58.82%	66.85%	873.5	2,194.4
1980	87.40%	100%	90%	42.87%	63.48%	1,248.0	3,587.3
1981	98.63%	100%	90%	32.21%	34.05%	1,650.0	4,808.6
1982	92.44%	100%	90%	10.00%	18.99%	1,815.0	5,721.9
1983	102.92%	100%	90%	53.55%	49.20%	2,787.0	8,536.9
1984	115.52%	100%	90%	79.40%	55.31%	5,000.0	13,258.3
1985	97.55%	100%	90%	68.00%	72.22%	8,400.0	22,833.6
1986	94.49%	100%	90%	66.67%	76.38%	14,000.0	40,274.3
1987	97.38%	100%	90%	59.29%	63.57%	22,300.0	65,874.8
1988	96.22%	100%	90%	56.05%	62.19%	34,800.0	106,843.6
1989	97.14%	100%	90%	75.29%	80.45%	61,000.0	192,796.5
1990	82.19%	100%	90%	74.67%	112.53%	106,550.0	409,743.1
AVG	95.50%			54.08%	62.77%		

Rw = $(1+DW)/(1+INF)$

URUGUAY

INCOME/INFLATION



■ Rw ◇ 100% △ 90%

VENEZUELA

INCOME/INFLATION

YEAR	Rw	REF.1	REF.2	INCOME	INFLATION
1976	108.27%	100%	90%	16.50%	7.60%
1977	107.84%	100%	90%	16.57%	8.09%
1978	109.17%	100%	90%	16.92%	7.11%
1979	94.39%	100%	90%	13.73%	20.50%
1980	100.00%	100%	90%	19.63%	19.63%
1981	97.65%	100%	90%	7.94%	10.54%
1982	94.89%	100%	90%	2.32%	7.83%
1983	93.53%	100%	90%	0.01%	6.93%
1984	91.19%	100%	90%	5.59%	15.78%
1985	98.07%	100%	90%	7.02%	9.12%
1986	96.12%	100%	90%	8.34%	12.71%
1987	75.62%	100%	90%	6.07%	40.27%
1988	89.06%	100%	90%	20.68%	35.51%
1989	70.68%	100%	90%	27.93%	81.00%
1990	90.12%	100%	90%	23.00%	36.48%
1991	93.50%	100%	90%	22.50%	31.02%
1992	91.61%	100%	90%	20.80%	31.86%
1993	89.16%	100%	90%	30.10%	45.92%

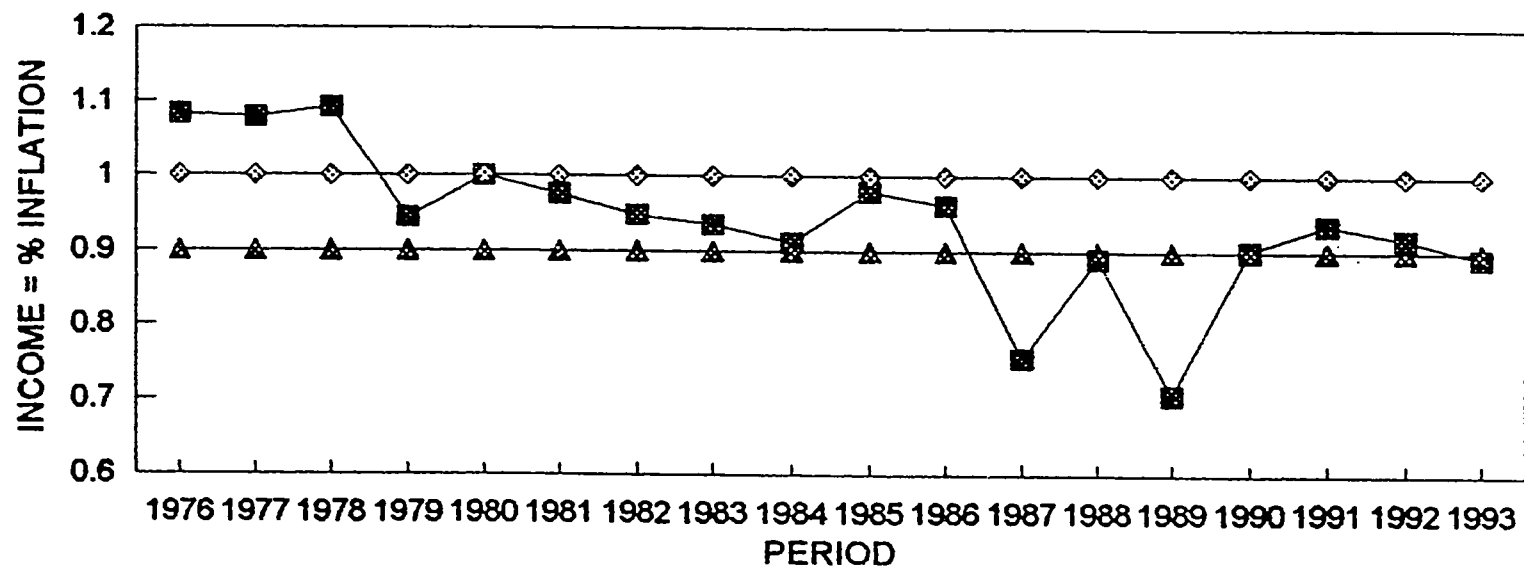
AVG	93.94%			14.76%	23.77%
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(1+Dw) =	1.1476	Dw =	14.76%
(1+Inf) =	1.2377	Inf =	23.77%

Rw = (1+Dw)/(1+Inf) = 92.72%

VENEZUELA

INCOME/INFLATION



■ Rw ◇ 100% ▲ 90%

CHART No. 1

HOUSING FINANCE UNDER INFLATION

	I	II	III	IV	V	VI	VII
$Rw = (1+Dw)/(1+Inf)$	105.00%	99.99%	95.00%	90.00%	85.00%	80.00%	70.00%
$Ri = (1+Int)/(1+Inf)$	105.33%	105.33%	105.33%	105.33%	105.33%	105.33%	105.33%
$Rw/Ri =$	0.9968	0.9493	0.9019	0.8544	0.8070	0.7595	0.6646
$Dw =$	57.50%	49.99%	42.50%	35.00%	27.50%	20.00%	5.00%
Inflation =	50.00%	50.00%	50.00%	50.00%	50.00%	50.00%	50.00%
Rate of Interest	58.00%	58.00%	58.00%	58.00%	58.00%	58.00%	58.00%
Income Year 1	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000
Payment Year 1	300,000	300,000	300,000	300,000	300,000	300,000	300,000
Term	15	15	15	15	15	15	15
RECUPERATION	6,797,248	4,496,402	3,059,240	2,144,094	1,551,498	1,157,779	696,677
DEBT CAP. Dbl.Indx.	4,387,741	3,042,766	2,171,965	1,594,575	1,203,849	932,079	593,045
DEBT CAP. T.M.	516,700	516,700	516,700	516,700	516,700	516,700	516,700
Dbl.Indx/TM	8.49	5.89	4.20	3.09	2.33	1.80	1.15

Dw = Average Salary Increment

Inf. = Average Inflation

Int. = Rate of Interest

TM = Traditional Method

Formulas:

(Beginning of Period) Debt Cap. = $P1 \cdot (Rw/Ri) \cdot (1 - (Rw/Ri)^n) / (1 - (Rw/Ri))$
 Recuperation = $P1 \cdot Rw \cdot (1 - Rw^n) / (1 - Rw)$

(End of Period) Debt Cap. = $(P1 / (1 + Int)) \cdot (1 - (Rw/Ri)^n) / (1 - (Rw/Ri))$
 Recuperation = $(P1 / (1 + Inf)) \cdot (1 - Rw^n) / (1 - Rw)$

CHART No. 2

HOUSING FINANCE UNDER INFLATION

	I	II	III	IV	V	VI	VII
$R_w = (1+D_w)/(1+I_{fi})$	105.00%	99.99%	95.00%	90.00%	85.00%	80.00%	70.00%
$R_i = (1+Int)/(1+I_{nf})$	104.57%	104.57%	104.57%	104.57%	104.57%	104.57%	104.57%
$R_w/R_i =$	1.0041	0.9562	0.9085	0.8607	0.8128	0.7650	0.6694
$D_w =$	83.75%	74.98%	66.25%	57.50%	48.75%	40.00%	22.50%
$I_{nf} =$	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%
Interest Rate	83.00%	83.00%	83.00%	83.00%	83.00%	83.00%	83.00%
Income Year 1	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000
Payment Year 1	300,000	300,000	300,000	300,000	300,000	300,000	300,000
Term	15	15	15	15	15	15	15
RECUPERATION	6,797,248	4,496,402	3,059,240	2,144,094	1,551,498	1,157,779	696,677
Debt Cap.. Dbl.Indx.	4,650,401	3,203,802	2,272,064	1,657,820	1,244,709	959,168	605,963
Debt Cap..T.M.	361,404	361,404	361,404	361,404	361,404	361,404	361,404
Dbl.Indx./TM	12.87	8.86	6.29	4.59	3.44	2.65	1.68

CHART No. 3

HOUSING FINANCE UNDER INFLATION

	I	II	III	IV	V	VI
$Rw = (1+Dw)/(1+Inf) =$	80.00%	85.00%	90.00%	95.00%	99.99%	105.00%
$Ri = (1+Int)/(1+Inf) =$	105.48%	105.48%	105.48%	105.48%	105.48%	105.48%
$Rw/Ri =$	0.7584	0.8058	0.8532	0.9006	0.9480	0.9955
Dw =	8.80%	15.60%	22.40%	29.20%	35.99%	42.80%
Inflat. =	46.00%	46.00%	46.00%	46.00%	46.00%	46.00%
Rate of Interest	54.00%	54.00%	54.00%	54.00%	54.00%	54.00%
Income Year 1	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000
Payment Year 1	300,000	300,000	300,000	300,000	300,000	300,000
Term	15	15	15	15	15	15
RECUPERATION	1,157,779	1,551,498	2,144,094	3,059,240	4,496,402	6,797,248
Debt Cap..Dbl.Indx	927,047	1,196,287	1,582,913	2,153,574	3,013,276	4,339,784
Debt Cap. T.M	554,701	554,701	554,701	554,701	554,701	554,701
RELT. Dbl.Indx/TM	1.67	2.16	2.85	3.88	5.43	7.82

CHART No.4

HOUSING FINANCE UNDER INFLATION

	I	II	III	IV	V
$Rw = (1+Dw)/(1+Inf) =$	85.00%	90.00%	95.00%	101.00%	105.00%
$Ri = (1+Int)/(1+Inf) =$	106.67%	106.67%	106.67%	106.67%	106.67%
$Rw/Ri =$	0.7969	0.8438	0.8906	0.9469	0.9844
$Dw =$	2.00%	8.00%	14.00%	21.20%	26.00%
Inflation =	20.00%	20.00%	20.00%	20.00%	20.00%
Rate of Interest =	28.00%	28.00%	28.00%	28.00%	28.00%
Income Year 1	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000
Payment Year 1	300,000	300,000	300,000	300,000	300,000
Term	15	15	15	15	15
RECUPERATION	1,551,498	2,144,094	3,059,240	4,877,359	6,797,248
Debt Cap. Dbl.Indx.	1,213,733	1,592,870	2,147,203	3,188,556	4,241,609
Debt Cap. T. M.	1,045,016	1,045,016	1,045,016	1,045,016	1,045,016
Dbl.Indx./TM	1.16	1.52	2.05	3.05	4.06

CHART No. 5

DEBT CAPACITY

DOUBLE INDEXATION

Rw = (1+Dw)/(1+Inf) =	90.00%	90%	90%	90%
Ri = (1+Int)/(1+Inf) =	106.67%	106.15%	105.71%	105.33%
Rw/Ri =	0.8438	0.8478	0.8514	0.8544
INFLATION =	20.00%	30%	40%	50%
RATE OF INTEREST	28.00%	38%	48%	58%
TERM	15	15	15	15

MONTHLY INCOME	PAYMENTS 25%INC/YEAR	DEBT CAP. INF.= 20%	DEBT CAP. INF.=30%	DEBT CAP. INF.=40%	DEBT CAP. INF.=50%	RECUP.
30,000	90,000	447,995	459,277	469,342	478,373	643,228
40,000	120,000	597,326	612,370	625,789	637,830	857,638
50,000	150,000	746,658	765,462	782,236	797,288	1,072,047
60,000	180,000	895,990	918,555	938,683	956,745	1,286,456
70,000	210,000	1,045,321	1,071,647	1,095,130	1,116,203	1,500,866
80,000	240,000	1,194,653	1,224,739	1,251,578	1,275,660	1,715,275
90,000	270,000	1,343,984	1,377,832	1,408,025	1,435,118	1,929,685
100,000	300,000	1,493,316	1,530,924	1,564,472	1,594,575	2,144,094
150,000	450,000	2,239,974	2,296,386	2,346,708	2,391,863	3,216,141
200,000	600,000	2,986,632	3,061,849	3,128,944	3,189,150	4,288,188
250,000	750,000	3,733,290	3,827,311	3,911,180	3,986,438	5,360,235
300,000	900,000	4,479,948	4,592,773	4,693,416	4,783,726	6,432,282
350,000	1,050,000	5,226,606	5,358,235	5,475,652	5,581,013	7,504,329
400,000	1,200,000	5,973,264	6,123,697	6,257,888	6,378,301	8,576,376

FORMULAS (Beginning of Period)

RECUPERATION = $(P1 \cdot Rw \cdot (1 - Rw^n) / (1 - Rw))$

DEBT CAP. = $P1 \cdot (Rw/Ri) \cdot ((1 - Rw/Ri)^n / (1 - Rw/Ri))$