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FINAL PROJECT

**“HOUSING FINANCE IN COLOMBIA: FROM UPAC TO  
UVR”**

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## TABLE OF CONTENTS

0. Introduction .....	P. 1
1. Housing financing in an inflationary economy – Emergence of UPAC .....	P. 4
2. Evolution and crisis of the UPAC system. Emergence of the UVR .....	P. 12
3. The new system: UVR .....	P. 24
4. A general view of UPAC system's results ....	P. 34
5. Conclusions and recommendations .....	P. 46

## Introduction

At the end of the 1960s, Colombia was experiencing growth problems. The import substitution model adopted by the country since the 1940s was beginning to show signs of exhaustion, affecting economic growth and employment rates. Therefore, the government (Lleras administration, 1966-1970) introduced some major economic and institutional changes aimed at changing the model, going from the import substitution model to an “export oriented” one. The country was relatively successful in making this transition, thanks to a favorable international environment (Currie, 1971). From 1970 to 1974, coffee exports (traditionally the most important sector in export terms) grew 33.7%, while “non traditional exports” (in general exports with a higher value added content) grew 83.1% in real terms.<sup>1</sup>

Notwithstanding the above situation, the new government of President Misael Pastrana (1970-1974) considered that the country lacked a comprehensive development strategy, one capable of integrating all productive forces of the economy. After pondering different alternatives, the government proposed a “national development plan”<sup>2</sup> in which the “construction sector” (with a strong emphasis on housing) was to be a “leading sector” (along with exports) of the economy. It was assumed that this sector was ideal to pull the economy as a whole, because of the following facts: i) the sector had numerous and strong backward linkages, so its impulse would be able to improve utilization of installed capacity in a variety of consumer and intermediate goods industries; ii) being “labor intensive”, its impulse would have a strong, immediate and positive impact on employment; iii) the existence of forward linkages related to the potential demand that could be boosted by the expansion of construction sector; iv) last, but not least, development of this sector did not need much foreign exchange, a very “scarce good” at that time, given the low level of exports naturally resulting from an import substitution strategy (Currie, 1971).

Central to the implementation of the new “development strategy” was the issue of financing. Since by 1971 inflation was already a major characteristic of the Colombian

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<sup>1</sup> Between 1970 and 1974, economic growth was on average 6.7% (DANE, 1981). This rate of growth, however, would plummet in 1975, as a result of the world oil crisis of 1973.

<sup>2</sup> Plan Nacional de Desarrollo “Las cuatro estrategias”. Departamento Nacional de Planeación, 1971.

economy<sup>3</sup>, traditional financing was not applicable because of the well-known “non neutral effects” of inflation on capital markets<sup>4</sup>. It was then necessary to develop a new type of financial mechanism, one able to reach a certain degree of equilibrium between supply and demand, offering acceptable rates of return in real terms to the potential savers and at the same time creating feasible debt service schedules for a much larger proportion of the population, with a limited income and many other needs to cover.

Therefore, the original vision behind the creation of the index-linked housing finance system (UPAC<sup>5</sup>) was to convert housing into a significant “leading sector” as part of an overall development strategy designed to accelerate Colombia’s urbanization and industrialization, and to promote the mobility of labor from low-paying activities (including agriculture) toward higher paying activities (employment in housing and related industries) where the potential, or latent, demand was very great and which could be stimulated via the way in which index-linked mortgages could overcome the front-end loading problem for borrowers while at the same time increasing the flow of savings to the sector. (Currie, 1974).

Despite the fact that by the mid seventies the country had<sup>6</sup> a serious housing shortage, the policy stated by the new government, more than a sector program to close the gap, was a macroeconomic strategy, some sort of a development paradigm. This is important to understand why this sector received such a high priority within the country’s economy during the following decades, as well as to understand the type of actions the government was prepared to do in order to finance the scheme.

The purpose of this document is to analyze the evolution of the financial mechanism developed by the government in 1972 to implement its new policy (UPAC) up to its removal at the end of 1999, studying the behavior of the new mechanism designed to

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<sup>3</sup> In 1960s the average rate of inflation was 11.5% and, this statistic almost double for the 1980s with an average rate of inflation of 19.5%, becoming a significant phenomenon, with a fast growing trend.

<sup>4</sup> In an inflationary scenario the government, for different reasons, usually set ceilings to nominal interest rates. This tends to discourage savings and stimulates borrowing, creating a strong disequilibrium between supply and demand for funds. Available funds are rapidly depleted. This situation is particularly critical in such sectors as housing where, because of the magnitude of assets relative to income of most households, long term financing is indispensable. For a thorough discussion of these issues, see Sandilands (1980).

<sup>5</sup> UPAC stands for Unidad de Poder Adquisitivo Constante (Constant Purchasing Power Unit).

<sup>6</sup> And still has. The housing deficit calculated by DNP to 2000 was 26%, from which 13% is quantitative and 13% qualitative.

replace the original UPAC, called UVR<sup>7</sup>, and “comparing” the two mechanisms. In the final chapter, the document makes some statements trying to explain the present situation of the housing sector and some of the observed phenomena concerning the rather discouraging response of the market to important incentives introduced by the government in the last two years. Finally, some policy recommendations are given.

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<sup>7</sup> UVR stands for Unidad de Valor Real (Real Value Unit).

## 1. Housing financing in an inflationary economy – Emergence of UPAC

Housing finance confronts several problems, all related to the size of the involved assets compared to family's disposable income. This size always is very large, so this necessarily implies two things: first, the need to assure availability of long term loans, for otherwise debt's service would imply monthly installments way beyond the capacity of most households; second, closely related, it implies "capitalization of nominal interests", that is, the possibility that accrued interests in one period (say, a month) can be just partially paid in that period, the rest being carried on to the outstanding balance. This is so because, given the size of the loan relative to the "normal" household income, total payment of the accrued interest would lead to a payment impossible to cover by the "normal", middle income household.<sup>8</sup> For a quantitative illustration of this point see Appendix 1. If for any reason "interest capitalization" is prohibited by Law (as it was the case in Colombia in the beginning of the 1970's) then it is indispensable to develop a mechanism that somehow gets around this prohibition.

In an inflationary economy<sup>9</sup>, the second situation described above is a major problem, because nominal interest rates tend to be very high and grow relatively fast, making the first mortgage payments so high that the service of the debt becomes impossible even for a person with an average or above average income.<sup>10</sup> If inflation exceeds a certain level (20% a year, for instance) the situation may reach the absurd that the only people capable of servicing the credit are those who do not need it, because they have enough resources to acquire the good paying it for in cash.

At the beginning of the 1970's, housing finance in Colombia was essentially made through two state entities (Banco Central Hipotecario - BCH, Instituto de Crédito territorial – ICT). These institutions were financed through three main sources: (i) "forced

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<sup>8</sup> This is the well-known "front end loading" phenomenon. See Sandilands, 1980.

<sup>9</sup> For a thorough illustration of the distortions created by inflation, see Sandilands, 1980.

<sup>10</sup> In an inflationary economy, nominal rates of interest include three elements: the inflation rate, the overhead carried out by the financial intermediary and the "real" cost of money. Thus, an economy facing an annual inflation rate of, say, 20%, could easily see nominal interest rates of around 30% - 35% a year. It is easy to imagine the effect of such rates upon the service of a credit whose magnitude may be 30 or 40 times the monthly disposable income of a typical household. Thus, in an inflationary economy, the "front end loading" problem associated to the financing of housing is greatly exacerbated.

investments” (obligatory for financial establishments)<sup>11</sup>; (ii) resources directly coming from the national budget; and (iii) private funds channeled through savings accounts (Echeverry, 1999). These low cost sources of funds made it possible for those institutions to have in turn a supply of long-term credit to finance housing acquisition. What this arrangement meant was that some agents (the government, the financial institutions and the private owners of saving accounts) subsidized the beneficiary of the loans, thus creating an artificial and highly unbalanced market<sup>12</sup>. As expected, this situation generated strong disequilibria between a very high demand (every body wanted to have access to the highly subsidized loans) and a low supply of funds (financial intermediary maintained forced investment to the minimum level, budget transfers were obviously limited and private savers were more and more discouraged by the low return of their saving accounts in real terms) for financing housing acquisition.

The mentioned disequilibria engendered two effects, both undesired. First, from the sector’s development point of view, the lack of credit supply in sufficient magnitudes determined a low level of growth and an aggressive deterioration of habitational deficits previously existent. In the beginning of the 1970s, even though Colombia’s construction sector was relatively big compared to other countries with similar development levels, housing deficit was calculated to be 20%<sup>13</sup>. Second, the disequilibria between the high demand for housing credit and the low supply, determined that the two existent institutions (ICT and BCH) started to assign these credits with political or based on other non-transparent criteria, impeding that subsidies reached the poorest and sometimes contributing to aggravate the income distributional problems by granting loans to less needy population segments but that were closer to the government in turn.

In this respect, the Asociación Bancaria states: “ But these expected benefits (from concessional credit) have not been exempt from pitfalls: in first place, the validity of the subsidy must have stimulated the preferential demand for concessional credit by firms

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<sup>11</sup> These “forced investments” were imposed by law on commercial banks, insurance companies and other financial agents. Those “forced investments” paid fixed rates and had long maturity terms (10 – 20 years). The two state institutions (BCH and ICT) also received resources directly from the national budget and in some proportion from individual investors, through personal savings accounts. The forced investments financed different modalities of concessional credit (crédito de fomento) in the manufacturing, agricultural and construction sectors, and other considered “priority” by governmental policy. (Asobancaria, 1986)

<sup>12</sup> The magnitude of the subsidy implicitly in forced investments is estimated to be around 80%. (Asociación Bancaria, 1986.)

<sup>13</sup> The author makes an extrapolation of the observed tendency between 1964 and 1974. Conpes Document, 1974.

that otherwise would have accessed ordinary credit. As consequence of the above, the system has been exposed to the distraction of subsidized resources going to other destinies different from the anticipated by the Law or by the decisions of the authorities. Additionally, the fact that the banking portfolio has traditionally pleased the clients concentrated in the higher levels of capital, leads to the presumption that concessional credit has become an additional ingredient of the offered “package” of services by banks to the mentioned type of clients. Being things this way, the beneficiaries of concessional credit were in fact the less needy.”<sup>14</sup> Even though the Asociación Bancaria uses the term “clients” in an economic or commercial sense, there is sufficient evidence that it can also be applicable in its political sense in some public institutions. In fact, one of the principal reasons claimed by the government in the beginning of the 1990s to dismount concessional credit was, precisely, its lack of transparency in the process of assigning the subsidized resources, both in private and public entities<sup>15</sup>.

Given this situation, if the government wanted the construction sector (and more specifically housing) to expand significantly, it was absolutely indispensable to find a financial mechanism capable of solving the above mentioned problems, by increasing private savings and channeling them to the construction sector, in such financial conditions that effective demand would not be endangered.

In May 1972, President Misael Pastrana (1970-1974), following the principles stated in the “National Development Plan”<sup>16</sup> and using his faculty of intervening the economy and in particular the management of private saving, issued Decrees 677 and 678, both aimed at establishing a whole new financing system for the construction sector, powerful enough to fuel its development as a leading sector of the economy.

Decree 678 created the Corporaciones de Ahorro y Vivienda (CAVs) with the purpose of promoting private saving and channeling it into the construction sector within a new “constant value system”. Decree 677 created the Fondo de Ahorro y Vivienda (FAVI) in the Banco de la Republica (BR) which was meant to be a specialized financial institution to serve CAVs, absorbing their temporary cash excesses and paying them a market rate

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<sup>14</sup> Asociación Bancaria de Colombia, “Las inversiones forzosas del sistema bancario”. Revista Banca y Finanzas No. 194. Bogotá, Diciembre de 1986, p. 41.

<sup>15</sup> The dismount of concessional credit occurred very early during Cesar Gaviria’s Administration (1990-1994)

<sup>16</sup> “Las Cuatro Estrategias”. See footnote 3.

for them, and making temporary loans to CAVs whenever they required funds to close temporary liquidity shortages. The last Decree (678) stipulated that savings and loans would adjust periodically with respect to changes in the currency's purchasing power (by linking them to the evolution of the price index certified by the National Statistical Office - DANE) and that interest would be paid on the principal's adjusted value. The development of this principle, originated Decree 1229 (July, 1972) giving birth to the Unidad de Poder Adquisitivo Constante (UPAC).<sup>17</sup> This established two mechanisms of fundraising – saving accounts and certificates – and defined the characteristics of both instruments in terms of periods and interest rates, creating the first saving option with daily-adjusted accounts. (Caballero, 1987)

Since their creation, CAVs enjoyed three important advantages over the rest of the credit establishments existing in the country: i) “capitalization of interests” in their loans<sup>18</sup>; ii) saving accounts adjusted by inflation; and iii) access to the specialized stabilization fund (FAVI) created by the government to minimize the economic effects over CAVs of temporary excesses or shortages of liquid funds. (Castellanos, 1999)

First, the initial definition of UPAC as a currency whose nominal value grew correspondingly to inflation, allowed to capitalize most of the inflationary component of the interest rate when registering it as a greater value of the unit, and therefore, to the outstanding loan's balance. Through this mechanism, CAVs could charge “low” interest rates (close to the “real” interest rate) throughout the contract, without breaking the law<sup>19</sup>.

On the other hand, by having the exclusive right to offer deposits denominated in UPAC, CAVs were the only financial intermediaries that could remunerate short-term savings linked to inflation, and therefore guarantee a positive rate to the investor. This exclusive

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<sup>17</sup> To a great extent, the UPAC system is due to Professor Lauchlin Currie (1902-1993). For a detailed discussion of the creation of constant value saving system, see the documents of Professor Currie “La Corrección Monetaria, Ahorro y Financiación de Vivienda” included in “Políticas de Crecimiento y Desarrollo (Banco de la Republica, 1982) and “Ahorro, Corrección Monetaria y Construcción”. (Universidad de los Andes, 1974)

<sup>18</sup> In fact, “capitalization of interests” is a misleading statement. What is basically “capitalized” is the inflationary component of the nominal rate of interest.

<sup>19</sup> “Capitalization of interests” was forbidden by law. Therefore a loan denominated in “pesos” could not behave the same way that one denominated in UPAC, because the applicable “interest rate” was not the “real” (as in loans denominated in UPAC) but a “nominal” one, in order to incorporate both the interest component and the inflationary component.

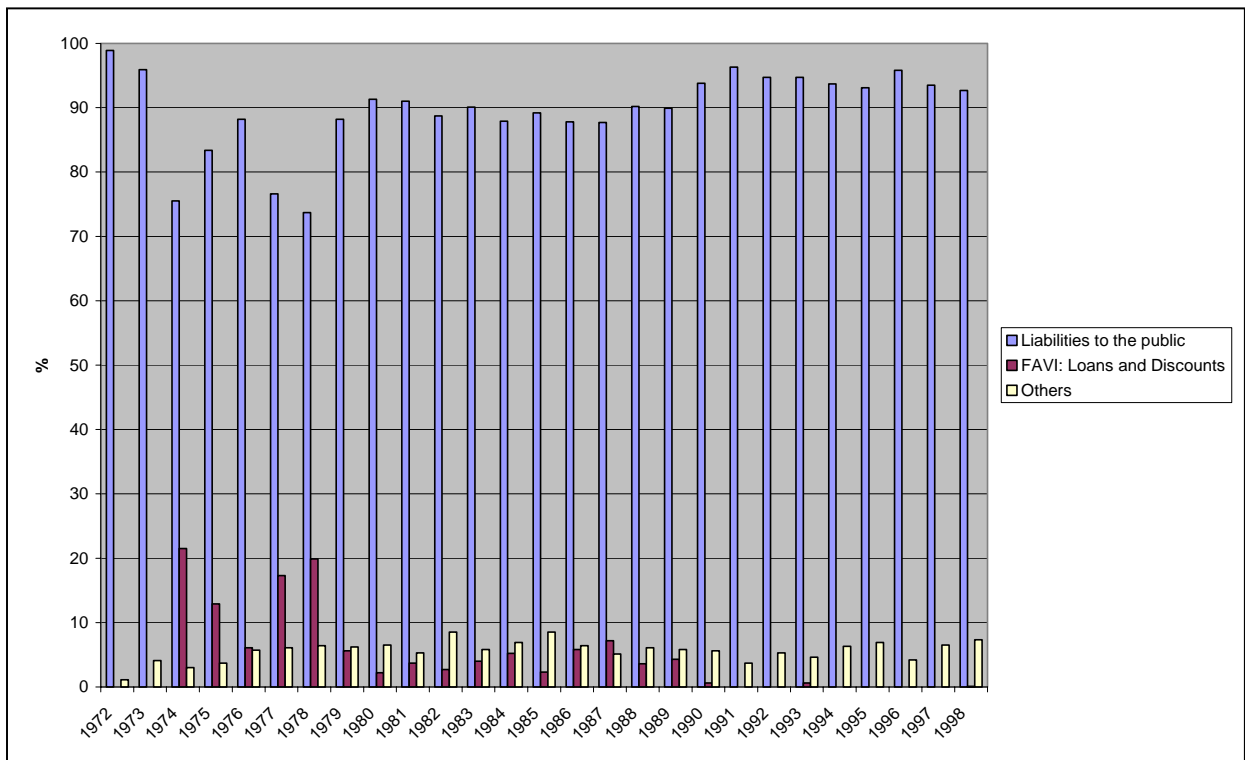
right, in an environment where very few financial instruments existed, gave CAVs an enormous competitive advantage, which, as expected, allowed them to rapidly raise enough short-term savings to finance their operations.

To complete their advantages, CAVs had access to the above-mentioned FAVI, a Fund managed by the Central Bank, a liquidity regulating mechanism that allowed CAVs to invest their temporary liquidity excesses at market rates and cover their temporary liquidity shortages. Through this Fund, the Central Bank remunerated at market rates the excesses of liquidity and financed a fall in deposits. The importance of this mechanism can be seen by noting that during the first years of the system, when it was developing, FAVI's loans to CAVs reached 21.5% of total CAVs liabilities. On average, between 1974 and 1988, FAVI held 8% of CAV's liabilities. (See Chart 1.1 and Graph 1.1 for a complete evolution of CAV's liabilities). This mechanism obviously contributed to increase de stability of the system, giving it an additional competitive advantage over the rest of the financial intermediaries.

CHART 1.1 – CAVS' LIABILITIES

Year	Liabilities to the Public (%)	FAVI: Loans and Discounts (%)	Other Liabilities (%)	Year	Liabilities to the Public (%)	FAVI: Loans and Discounts (%)	Other Liabilities (%)
1972	98.90	0.00	1.10	1986	87.80	5.80	6.40
1973	95.90	0.00	4.10	1987	87.70	7.20	5.10
1974	75.50	21.50	3.00	1988	90.20	3.60	6.10
1975	83.40	12.90	3.70	1989	89.90	4.30	5.80
1976	88.20	6.10	5.70	1990	93.80	0.60	5.60
1977	76.60	17.30	6.10	1991	96.30	0.00	3.70
1978	73.70	19.90	6.40	1992	94.70	0.00	5.30
1979	88.20	5.60	6.20	1993	94.70	0.60	4.60
1980	91.30	2.20	6.50	1994	93.70	0.00	6.30
1981	91.00	3.70	5.30	1995	93.10	0.00	6.90
1982	88.70	2.70	8.50	1996	95.80	0.00	4.20
1983	90.10	4.00	5.80	1997	93.50	0.00	6.50
1984	87.90	5.20	6.90	1998	92.70	0.10	7.30
1985	89.20	2.30	8.50	Source: Castellanos, 1999			

GRAPH 1.1 – CAVS' LIABILITIES



Source: Castellanos, 1999

Finally, the credit risk within this system was structurally low. In effect, in an inflationary economy that operated under the model of financial pressure, as the Colombian economy was during the 70's and 80's, land and housing property constituted an excellent option to preserve the value of savings. As a result, the prices of housing property showed an ascendant tendency, superior to inflation and with minor fluctuations. For this reason, the growth in housing value (the usual collateral for loans) was the best possible "collateral" to CAVs and also the best incentive for debtors to maintain punctual payments.

The combined effect of these competitive advantages led to an exceptional growth of the UPAC system. By 1975 (less than three years after their introduction) CAVs had captured about 37% of total financial savings in the country. In fact, as it will be seen later, as soon as 1974 (just two years after the creation of the system) the government issued legislation to cap the system's growth in order to avoid its total predominance within the financial sector, particularly in the saving accounts business. This change in legislation was the first of a large number of changes to come.

During the 1980s and 1990s the two main fund raising instruments available to CAVs (saving accounts and deposit certificates in UPAC) represented, on average, 95% of CAVs liabilities to the public. Since loans were denominated in UPAC, this fact determined that CAVs financial structure was very sound and stable, with their assets and liabilities denominated in the same accounting unit (UPAC). (Fedesarrollo, 1999)

In summary, the introduction of the UPAC system was appropriate for the growth strategy the government was committed to. The introduction of the constant value system allowed to overcome the structural limitation in housing finance related to the front-end loading problem, especially in an economy as the Colombian one, where it had commonly shown two-digit inflation indexes.

The privileges granted to the entities in charge of operating the new system helped to configure a new group of comparative advantages that guaranteed its fast development, and an enthusiastic market response, and as consequence, an ample availability of funds for housing finance. This in turn promoted a fast extension of the construction sector's level of activity, an important increase in employment levels (direct and indirect) and a significant rise in the number of house-owners, especially within the middle-income population.<sup>20</sup>

From the government's point of view, UPAC's introduction helped to solve other preoccupying problems, especially from the short-term perspective. On one hand, abolishing the necessity of budget transfers to entities that, until that moment, had given special attention to credit activity in the construction sector (ICT and BCH). On the other, by increasing drastically the availability of funds for housing finance, the previous disequilibria between credit demand and supply were significantly reduced, eliminating in this way the subjectiveness for granting loans based on subjective grounds. Finally, the facts mentioned above diminished the pressure over the maintenance of the "forced investments" that, despite their negative consequences over the financial system competitiveness, had been maintained due to the necessity of channeling resources to the construction sector; a sector that given its nature could not attract funds in the small and undeveloped Colombian money and capital market of that time.

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<sup>20</sup> See Chapter 4.

Despite the aforementioned benefits, the system presented instability structural problems, which became more and more evident as the success of the system determined that its relative importance within the financial sector passed from nil (before 1972) to very important (37% of total financial savings) in only two years after its introduction. The evolution of the system and its increasing instability until its disappearance at the end of the 1990s will be discussed in the next chapter.

## 2. Evolution and crisis of the UPAC system. Emergence of the UVR

As was mentioned in the previous chapter, the competitive advantages given to the UPAC system led to its immediate and powerful growth. Such a growth fueled an important development of the housing industry, as can be clearly seen in the next table and graph, but also introduced serious distortions in the financial sector<sup>21</sup>.

CHART 2.1 – LICENCES TO CONSTRUCTION<sup>22</sup> – NATIONAL SUMMARY – 56  
CITIES 1970-1992

YEAR	LICENSES (TOTAL)	AREA (M2)	LICENSES (HOUSING)	AREA (M2)
1970	18300	4562194	17670	3842783
1971	15184	4835410	14331	3977406
1972	14461	4581840	13520	3640749
1973	17706	6072938	16740	4948602
1974	15580	6725772	15639	5073885
1975	13765	4842520	12600	3637040
1976	14167	5127888	12985	3928161
1977	16040	6404538	14737	5011374
1978	17052	6093722	15817	5941140
1979	14984	6093722	13813	4717662
1980	15194	5941923	14086	4633630
1981	16183	6254538	15077	5190183
1982	15585	6259770	14414	4966259
1983	16872	8572538	15649	7293564
1984	16614	7711243	15435	6808258
1985	17133	8628295	15691	7403827
1986	13969	8413802	12531	6896018
1987	16871	9875837	14908	7707088
1988	16960	9941014	14851	7048313
1989	17198	8794652	15025	6476738
1990	16393	7651096	14399	5546715
1991	18902	9885634	16846	7687642

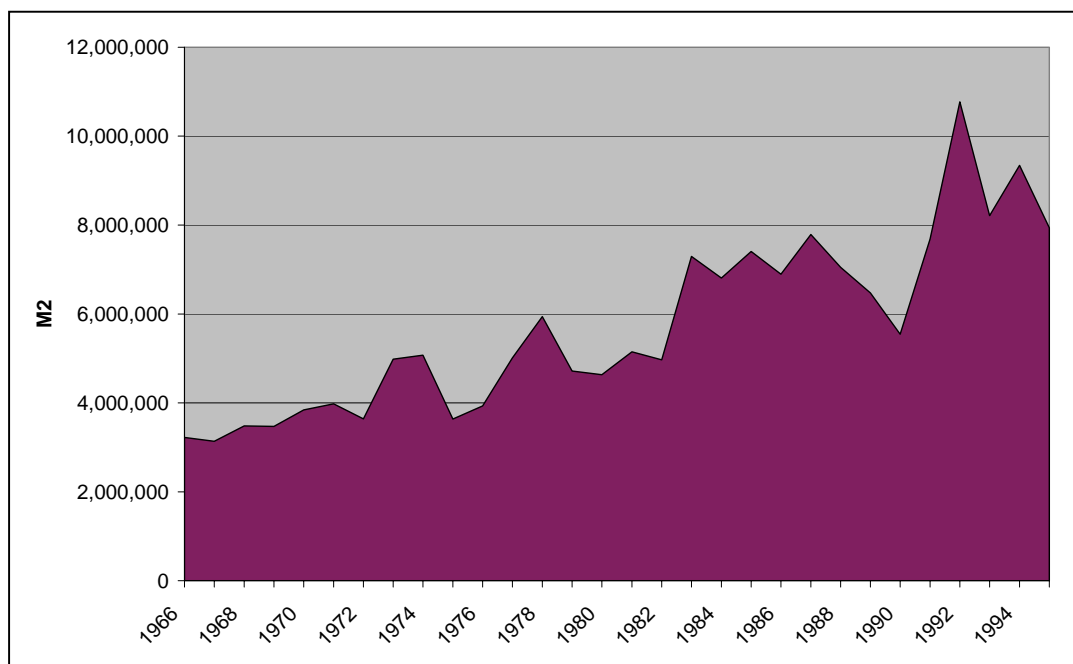
<sup>21</sup> According to Sandilands (2003), these distortions would occur in the case when the potential rate of return on savings invested in construction sector was lower at the margin than if these funds were invested elsewhere.

<sup>22</sup> Construction licenses are licenses issued by urban planning authorities. These are a mechanism used by local planning and fiscal authorities to regulate the process of urban development and to control the evolution of taxes linked to real estate.

1992	22031	13442330	19786	10774147
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Source: DANE. Boletín Mensual de Estadística, 1993.

GRAPH 2.1 – LICENSED SQUARED METERS FOR HOUSING CONSTRUCTION  
(1966 – 1995)



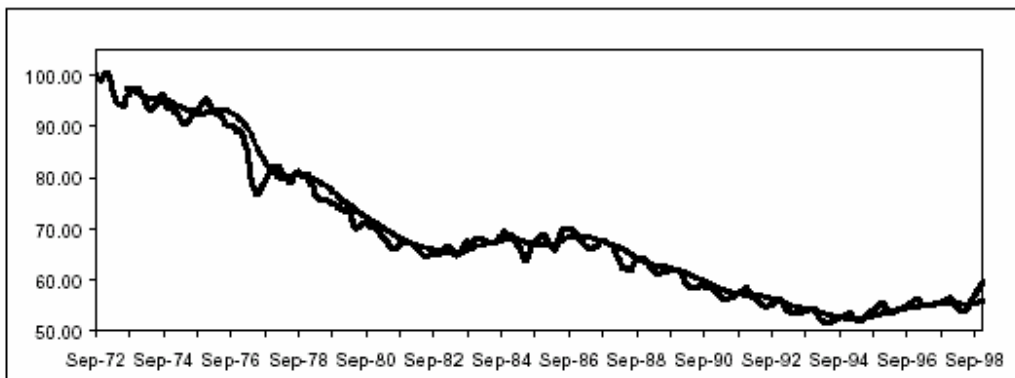
SOURCE: CAMACOL

The very success of the system induced one of its major long run problems: the lack of stability. In order to limit the growth of the system, the original formula (issued in 1972 and based on the consumer price index – CPI – of the previous quarter) was as early as 1973 (Decree 969) to a calculation based on the CPI variation of the previous year. This modification was followed by others directed towards the same purpose, in other words, to establish a ceiling to deposits' return denominated in UPAC terms, to avoid its complete dominance in savings fund-raising.<sup>23</sup>

<sup>23</sup> The modifications introduced to the system responded to different rationale, depending on the government that introduced them. In this way, while the reforms introduced by Pastrana's Administration were directed to control the growth of the system, the ones introduced by Lopez's Administration (1974-1978), at least in the beginning, aimed to minimize UPAC's presence in the financial market. According to this Administration, UPAC system was distorting and channeled excessive resources to the construction, in detriment of others possible more dynamic and with greater potential to impulse economic development, reason for which the system tried to be dismantled. However, in this moment the dynamics of the system was very strong and CAVs pressure and in some way public pressure as well, made it impossible for the system to be

Although the variations introduced to the calculation formula allowed to reach partially the aimed objective, they generated great instability and affected gravely the fundamental characteristic of the system, which was its capacity to maintain constant the value of the unit of account. In the beginning<sup>24</sup> the variations simply modified the period of changes in IPC<sup>25</sup> taken into account by the formula. But from 1974, this was not enough, so quantitative growth ceilings (quantitative caps) were established to UPAC's variation. Given that these ceilings were obviously under inflation levels (because otherwise it would had made no sense) they were gradually undermining UPAC's real value. Between 1972 and 1999, time when UPAC was abolished, the calculus formula suffered more than 20 modifications. The following graph shows UPAC's dramatic change in purchasing power through time. Since the beginning, UPAC's real value starts to fall drastically. However, this decrease stops in 1982 and stays relatively constant for the rest of the decade, when in 1990 it starts to plummet again until reaching 50% of its initial value in 1998. UPAC's huge loss in value affected gravely its competitiveness, especially once the financial market was no longer closed and strictly regulated. After this, a more wide and open "game" of interchanging market forces took place. (Cardenas et al, 2003)

GRAPH 2.2 - INDEX OF UPAC'S REAL VALUE (WITH RESPECT TO IPC) SEP.  
1972=100.



Source: Banco de la Republica, DANE

dismounted. Anyhow, the modifications introduced by Lopez's Administration were enough to affect the growing dynamic of the system. (Giraldo and Lopez, 1987)

<sup>24</sup> See Appendix 2 for a complete recount of the variations introduced to UPAC's calculation formula from 1972 to 1999

<sup>25</sup> IPC is one of Colombia's principal indexes to account for inflation. It stands for Indice de Precios al Consumidor.

As long as the financial sector stayed relatively closed (basically until mid 1980s) the modifications to the formula, aimed to lessen the competitive advantages of the system to avoid that it absorbed the totality of deposits from the public. Despite these changes introduced, its effectiveness was low. For this reason, the predominance of the UPAC system was almost complete since its introduction in 1972 until the end of 1980s when the liberalization effects of the economy started to show. From 1989 on, in contrast, the changes to the formula that followed were directed to improve CAV's loss of competitiveness with respect to other financial institutions, introducing in the calculation of the formula not only inflation but also DTF<sup>26</sup> variations.

Anyhow, from 1972 (Decree 1229) to 1999 (Resolution 8) the system's formula suffered 22 changes.<sup>27</sup> But the changes to the system were not limited only to modifications to the calculation formula. These changes were also referred to the framework of incentives of UPAC's savers (7 changes between 1972 and 1993), to the norms of deposits' reserves in UPAC (25 changes between 1972 and 1993), to the structure of credit uses in UPAC (14 changes between 1972 and 1993) and to the norms referred to loans rates of UPAC's system (15 changes between 1972 and 1991)<sup>28</sup>.

In the beginning of the 1990's the economy suffered a major structural change, characterized by the financial reform and the introduction of a more competitive environment. The liberalization of financial activities, ruled by the Financial Reform Law (Ley 45 de 1990), gradually introduced more competition in the market, both in the assets and the liabilities aspects. On the liabilities side, the new Law allowed other financial intermediaries to remunerate liquid saving accounts, thus stimulating new non-UPAC alternatives to attract short run savings. With respect to the assets side, it authorized the financial intermediaries to offer loans with amortization systems incorporating "capitalization of interests", which allowed them to compete in the housing financing market. (Fedesarrollo, 1999).

This situation led CAVs to link their deposits constituted in UPAC terms to the market interest rate, thus losing one of their main advantages, namely liabilities and assets both

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<sup>26</sup> Fixed Term Deposits Interest Rate

<sup>27</sup> For a detailed evolution of UPAC's changes in formula, see Appendix 2.

<sup>28</sup> Echeverry et al (1999) presents five tables in which the aforementioned changes are detailed.

denominated in UPAC terms.<sup>29</sup> The change introduced a difference in rates between assets and liabilities, which in turn led to a significant increase in the risk level of the system, since it became vulnerable to steep rises of the market interest rates. While maintaining the value of their assets (loans) linked to UPAC, a destabilization in rates exposed them to loss risks when interest rates increased significantly more than UPAC's rate of growth. Additionally, this increasing competition in deposits generated a bigger uncertainty in the obtention of volatile resources that were migrating to the intermediary who offered more, generating an increasing risk for the CAVs' model of terms (period) transformation (Fedesarrollo, 1999).

As a response to this situation, from 1988 the Central Bank (Banco de la República) started to change the formula to calculate the value of the UPAC, using a combination of inflation and interest rates to improve the attractiveness of deposits denominated in UPAC (Castellanos, 1999).

When the Central Bank decided to link the calculation of the UPAC to the evolution of the DTF it mitigated the mismatch in interest rates between CAV's assets and liabilities, but started to transfer an increasing amount of risk to the housing debtors. In effect, with the change of formula, the majority of debtors faced a similar disequilibria between their income –which moved in line with the changes in the minimum wage or inflation- and the growth of their obligation – which augmented in a much more marked and volatile way in line with interest rates of the market. (Castellanos, 1999)

In this new environment in which it was necessary to compete for resources, CAV's fundraising changed radically. UPAC savings accounts which had been the principal and more stable source of funds for the CAV, in 1998 dropped to 34% of total deposits, after having maintained an average of 80% between 1985-1992 (CHART 2.2). By diminishing their deposits in savings accounts, CAVs had to compete more and more as time passed for less stable deposits (CDT<sup>30</sup> in UPAC terms or in pesos) with the rest of the sector.

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<sup>29</sup> However, it is important to note that this was a real advantage only in the beginning, since the multiple modifications to the formula limited UPAC's index growth at the same rate as the market interest rate.

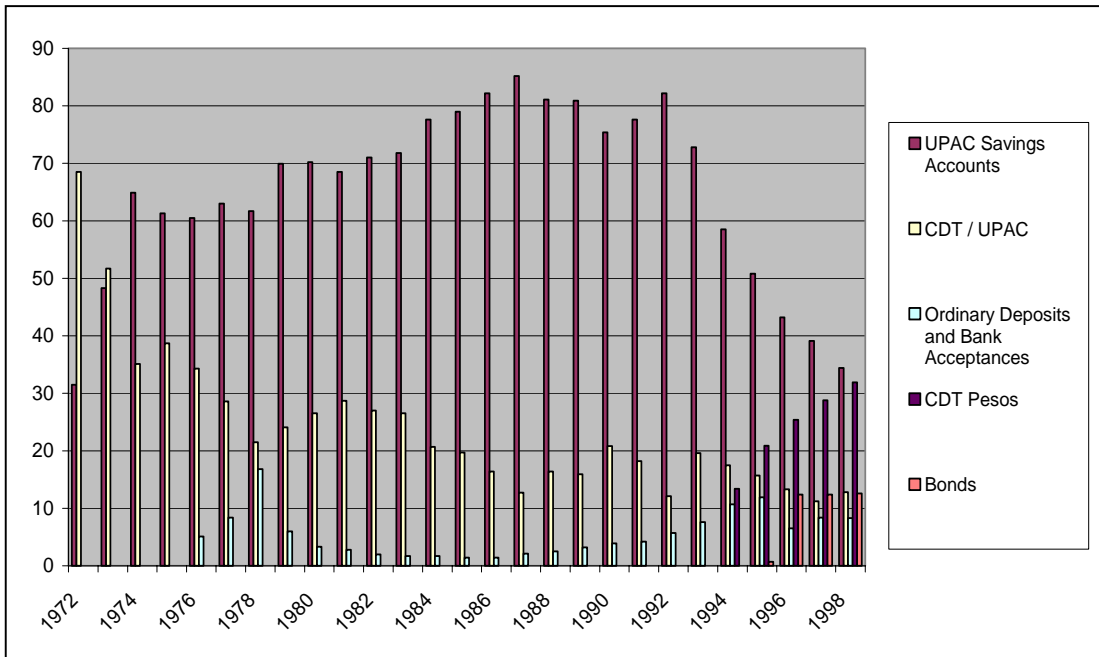
<sup>30</sup> Fixed Term Deposit Certificates

CHART 2.2 – CAVs' LIABILITIES TO THE PUBLIC % (1972-1998)

Year	UPAC Saving Accounts	CDT / UPAC	Ordinary Deposits and Bank Acceptances	CDT Pesos	Bonds
1972	31.5	68.5	0	0	0
1973	48.3	51.7	0	0	0
1974	64.9	35.1	0	0	0
1975	61.3	38.7	0	0	0
1976	60.5	34.3	5.1	0	0
1977	63	28.6	8.4	0	0
1978	61.7	21.5	16.8	0	0
1979	69.9	24.1	6	0	0
1980	70.2	26.5	3.3	0	0
1981	68.5	28.7	2.8	0	0
1982	71	27	2	0	0
1983	71.8	26.5	1.7	0	0
1984	77.6	20.7	1.7	0	0
1985	79	19.7	1.4	0	0
1986	82.2	16.4	1.4	0	0
1987	85.2	12.7	2.1	0	0
1988	81.1	16.4	2.5	0	0
1989	80.9	15.9	3.2	0	0
1990	75.4	20.8	3.9	0	0
1991	77.6	18.2	4.2	0	0
1992	82.2	12.1	5.7	0	0
1993	72.8	19.6	7.6	0	0
1994	58.5	17.5	10.7	13.4	0
1995	50.8	15.7	11.9	20.9	0.7
1996	43.2	13.3	6.5	25.4	12.4
1997	39.1	11.2	8.4	28.8	12.4
1998	34.4	12.8	8.3	31.9	12.6

SOURCE: Castellanos, 1999

GRAPH 2.3 - LIABILITIES TO THE PUBLIC % (1972-1998)



As it can be clearly seen in the chart, the quality of CAVs' liabilities stayed in a high level almost until the end of the 1980s, worsening dramatically especially after 1993. Whilst until the 1980s savings accounts and CDT denominated in UPAC represented more than 95% of liabilities to the public, in 1993 these two elements had already lowered this participation to 92%; and in 1998, they represented only 47.2% of total liabilities, while the new elements (ordinary deposits, CDTs denominated in pesos and bonds - all of them resources much less stable) represented 52.8% of liabilities to the public.

In this way, the CAV's portfolio grew 50.3% in 1994 and 48.6% in 1995, facing an inflation of 22.6% on average over the two years mentioned. This portfolio expansion – given the large maturation and exponential growth because of interest capitalization- created an even bigger challenge to attract funds in the future. (Fedesarrollo, 1999)

CAVs' difficulties in fundraising were more evident as time passed, and its portfolio's size increased. Bigger competition in the sector forced them to give more flexible financing conditions to debtors and enlarge their service portfolio by giving consumption and commercial loans. But in addition to the difficulties of financing such portfolio, there was a bigger risk of default by debtors. This risk materialized in 1998 and led the financial system, especially the CAVs, into a deep crisis.

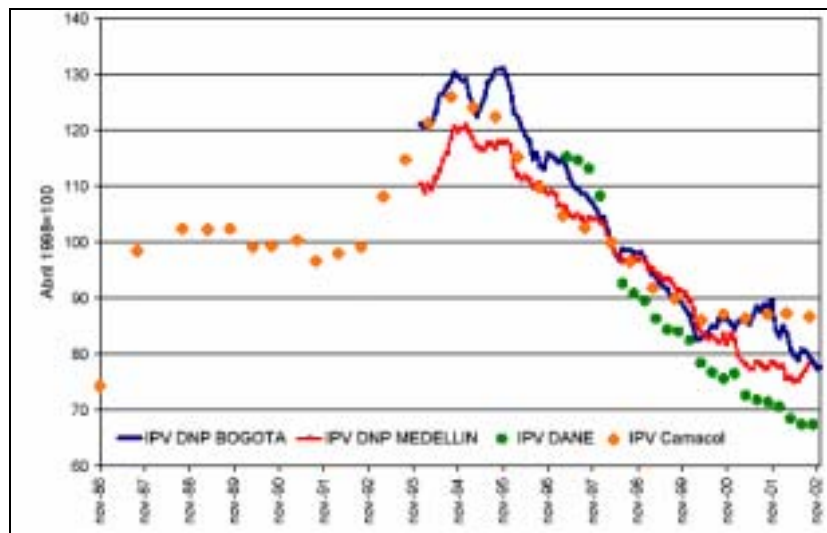
Although the problems of the system were clearly manifested since the beginning of the 1990s, they did not lead to an immediate crisis of construction sector, likely due to the "bubble effect" over the prices of housing caused by money laundering from drug dealing and other "underground" and illegal activities<sup>31</sup>. Graph 2.4 shows the steep rise in prices during the first years of the 1990s and the following dramatic fall from 1995 on. This phenomenon reached such proportions that it was enough for borrowers of the system to realize the level of the risk to them. They were conscious that even though the price of

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<sup>31</sup> Although drug-dealing activities had been occurring for various years back (end of the 1970s and beginning of the 1980s) it is in the end of the 1980s and beginning of the 1990s that such activities reach a significant volume or importance in economic terms. The availability of enormous amount of money in cash, and the preference by drug dealers for tangible assets, determined that they started to exert a strong pressure over real state raising extraordinarily the prices, especially in the middle-high and high-income stratum. This phenomenon allowed that despite of the huge increment of the financial cost of UPAC's system credits, debtors made a huge effort to stay up to date with their mortgage payments, given the fact that the value of their houses apparently was also rising significantly. The collapse of system occurred in 1995 when, in the one hand, the cost of the service of mortgage debts reached excessively high (unplayable levels) for most users of the system and when, in the second hand, as a result of the government front battle against drug dealing, this scourge stopped having an important presence in real state market .

their houses was growing faster than the value of their debt, this will not hold for long. The price rise phenomenon stopped in 1994, and this caused and even bigger problem to the system.

GRAPH 2.4 – REAL INDEXES OF HOUSING PRICES



SOURCE: CARDENAS, 2003

In summary, in this juncture characterized by changes in the products that increased the portfolio's credit risk and the loss of competitiveness in attracting deposits, CAVs tried to grow aggressively to compensate their new (much less favorable) environment. This fact made them even more vulnerable to changes in an economic environment characterized by a trend of diminishing inflation and increasing and more volatile interest rates.

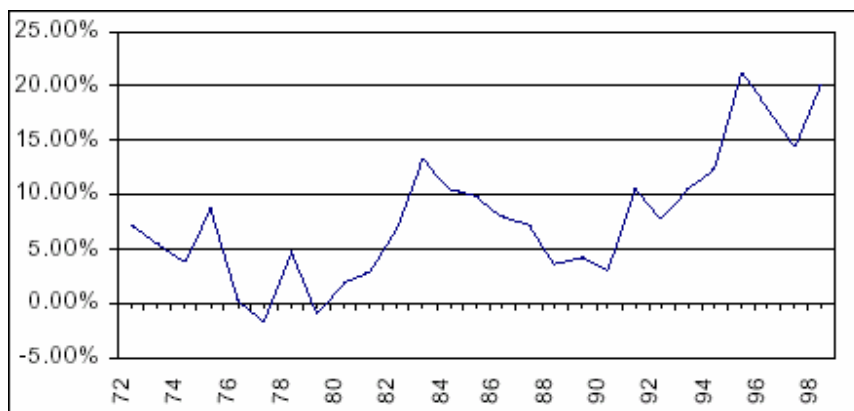
CAVs' (and UPAC's) crisis was then the combined result of three main factors: i) unstable deposits ii) depression of the real state market and iii) debtor's fragile capacity of payment. (Castellanos, 1999)

First, for the reasons already exposed, CAVs were facing a highly vulnerable situation to rises in the market interest rate, which reduced their base of stable and low cost deposits, diminishing their profitability margin. In this context, the term (period) conversion became more and more difficult and the viability of housing intermediation more uncertain.

Second, several long term tendencies contributed to reduce the attractiveness of housing property as a principal value deposit: i) the financial liberalization that opened new highly profitable alternatives to savers both domestic and overseas; ii) the clear tendency of inflation to decrease; and iii) innovation in banking practices that made less necessary the mortgage warranties. If this is added to a severe monetary policy at the beginning of the 90s and the already mentioned government struggle against drug trafficking activities, then it is possible to explain the marked fall of housing property prices since 1994.

Thirdly, the debtors of the system had to absorb completely the volatility of interest rates, in a period characterized by huge variations in monetary policy, which kept no correspondence to the growth of their income. This new element of fragility in the system became evident in 1998 when the real interest rate of the economy reached one of its highest peaks in history (See Graph 2.5). This obviously undermined the already affected debtor's payment capacity.

GRAPH 2.5 – Deposit Real Interest Rate (1972 – 1998)



Source: Banco de la Republica.

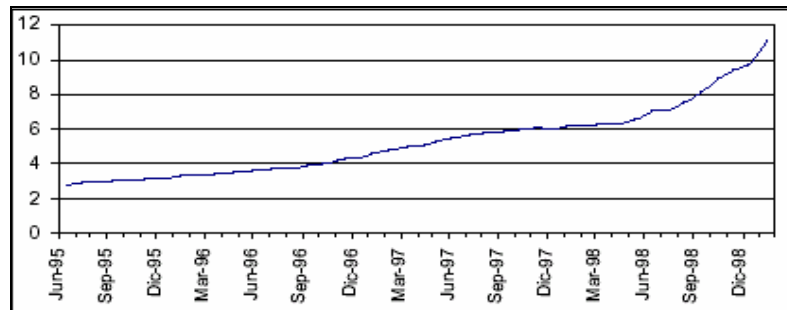
Also, the economy was in a state of collapse and with declining income there was a reduction in the volume of savings and a decline in the capacity to service existing debts or to take new debts/mortgages. So the problem was both higher nominal (and real) interest payments coupled with declining real incomes. (Sandilands, 2003)

The fall in housing prices along with the rise in value of the debt led to a situation where the debt exceeded the value of the collateral (specially in those properties acquired in

the construction's high part of the cycle). This, in turn, resulted in an extended non-payment with the corresponding delivery of properties by debtors as their houses as part of payment (repossession), as the Constitutional Court ruled.

The deterioration of CAV's portfolio is clearly shown in Graph 2.6. The overdue portfolio as a percentage of total CAV's portfolio went from 8.7% in 1997, to 13.4% in 1998 and to 17.3% in 1999. The goods received as part of payment - as a percentage of total assets – went from 0.7% in 1997, to 1.6% in 1998 and 2.2% 1999.

GRAPH 2.6 – CAV'S OVERDUE PORTFOLIO / TOTAL PORTFOLIO (1995-1998)



Source: Superbancaria

The accelerated increase of overdue portfolio, of goods received as part of payment and other unproductive assets, deteriorated CAV's profitability. In 1998, they registered a loss of \$449 thousand million pesos. The overdue portfolio plus the goods received as part of payment augmented from 95% of equity in 1997 to 159% in 1998 and 226% in 1999, which reflected the situation where savers' warranty had a doubtful collection or in the best case a very low profitability. (Fedesarrollo, 1999)

But perhaps more important than the financial effects over CAVs, the crisis had devastating social effects. An important number of debtors lost their house, generating a social drama of enormous proportions, and naturally, a serious political problem for the government.

This last element, especially, forced the government to conduct a thorough and structural examination of the system. After evaluating different alternatives, the government came to the conclusion that the best thing to do was to abolish the UPAC

system and replace it with a new instrument, the UVR, initiating in this way a new cycle in the construction sector of the country. This process is examined in the next chapter.

UPAC definitely was a good financial mechanism, especially as long as the economy remained “closed” and showed conditions of high inflation and economic growth. However, it could not overcome its most important structural restriction: the disparity in the scheme between short-term fundraising and long-term loans. This fact determined that, almost since the beginning of the system, modifications were done to UPAC’s formula trying to find equilibrium (or at least less disequilibria) between savers necessities and what debtors of the system required. As said before, between 1972 and 1999, time when UPAC was abolished, the calculation formula suffered more than 50 modifications, including changes in the calculation formula, changes in the incentives framework, changes in the operational rules for CAVs, etc.

Anyhow, during almost two decades UPAC system basically worked as expected: an adequate cash flow source of funds to the construction sector, based upon a rather unstable equilibrium between reasonably satisfied savers (with the remuneration they were obtaining from the system) and reasonably satisfied debtors (with the valuation of their property, which was enough to compensate for the significant nominal increases of their mortgage payments).

Two elements contributed to maintain this dynamic. On one hand, the fact that CAVs enjoyed for some time the exclusive privilege of short-term indexed deposits; on the other, the continuous rise in property’s value, as a result of the dynamics in the internal market. The first issue was easily achieved given the fact that the Colombian capital market was rather closed, highly regulated and controlled by the government. To the second element, apart from the “normal” market forces, the drug-dealing phenomenon contributed by artificially inflating land and property’s prices, being both assets suitable for money laundering.

When both elements started to weaken, the dynamics of the system did the same, beginning to need higher level of intervention from monetary authorities, generating higher distortions, given their relative volume compared to the rest of the financial system.

With the crisis and subsequent abolishment of UPAC, the government saw the need of reassessing Colombia's housing finance model. This new model was embodied in the New Law of Housing and it gave birth to a new unit, which replaced the UPAC: the UVR.

### **3. The new system: UVR**

The social and economic problems created by UPAC's crisis generated a profound loss of confidence in the system of housing finance, making ineffective almost every effort by the government to reactivate demand through new modifications to the calculation formula of the UPAC.

From the public point of view, the principal problem of the system was the link in the formula between UPAC's variation and interest rate. For this reason, when it was evident that probably the only way to reactivate demand was by changing the system, interest rate was abolished from the formula and was emphatically established the idea that the new index linked unit (UVR) should concentrate exclusively on inflation.<sup>32</sup>

During the last few years, a big discussion about the relative goodness of UVR with respect to the UPAC has been going on. While some claim that UVR is better than UPAC, others hold the contrary. In fact, it is the author's opinion that these two concepts are not comparable given its different nature. As it was mentioned in the introduction, the UPAC system more than a sector program or a financial tool, was an economic development strategy. In contrast, the UVR is something more modest, closer to a financial tool and with pretensions much smaller than UPAC's. Since an adequate understanding of UVR concept is essential to the analysis of both schemes in an accurate context, this chapter presents a comprehensive description of this instrument and makes a relatively detailed account of its principal characteristics from the financial point of view.

Contrary to what is normally believed, the Constant Real Value Unit (Unidad de Valor Real Constante – UVR) did not arise as part of the measures designed by the government in 1999 to confront the finance housing sector crisis. Originally, the UVR was developed inside the Ministry of Finance (Ministerio de Hacienda) with the purpose of issuing long-term bonds of public debt that protected the holder against variations in the price level of the economy and allowed it to ensure a positive real rate above inflation. However, months later the new Law of Housing adopted the UVR as the base for the new housing finance system. (Corfivalle, 2002)

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<sup>32</sup> As it was UPAC's original intention.

According to CONPES Document 3066 of December 1999, in which is recommended to adopt the proposed methodology to calculate the UVR, the “Unidad de Valor Real Constante” is an accounting unit that reflects currency’s purchasing power based exclusively in the variation of the Consumer Price Index (Indice de Precios al Consumidor – IPC), certified by DANE.

This definition reflects in the first place the decision of closing the possibility of repeating UPAC’s experience, by excluding the option of linking the evolution of the new unit to variables different to inflation, such as interest rates, exchange rates, economic growth, etc. Even though any methodology may be modified in the future, it is clear that from the beginning the UVR was designed to be based uniquely upon inflation. Regardless of this clarity, the variation in the Consumer Price Index gives room to diverse interpretations.

The methodology established by CONPES is based on the formula:

$$UVR_t = UVR_{15} * (1 + i)^{t/d}$$

where the period of calculation is the period between the day 16th of a determinate month and the day 15th of the next month. In this way, UVR’s value for a determinate day ( $UVR_t$ ), results from multiplying UVR’s current value of the last day of the previous period ( $UVR_{15}$ ) by a factor  $(1 + i)$ , where  $i$  is last month’s inflation, to the power of a fraction. This fraction represents the proportion of the period (in days) that has elapsed.

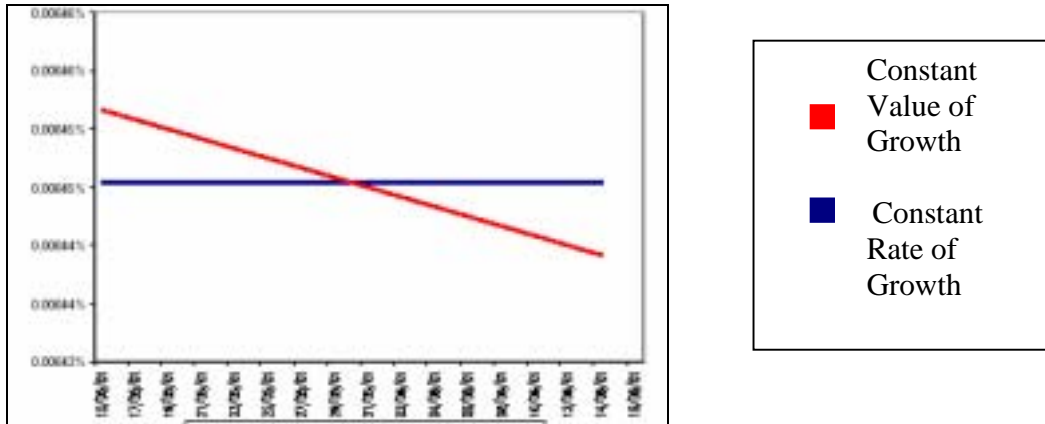
From the methodology chosen to calculate the UVR, it is important to stand out two issues. First, the interpretation chosen about “variation of Consumer Price Index, IPC” was a monthly variation. This decision, as will be seen later, is the center of the discussion around the UVR. The second important issue is that the unit grows daily at a constant rate instead of growing in a constant value.<sup>33</sup> If the absolute value that UVR grows every day were constant, the rate of growth would decrease as time passes. Although at the end of the period it reaches the same value, the path is different. Graph 3.1 shows the difference in the evolution of growth rates according to each methodology. This difference is important to the extent that it is pretended to develop the whole finance

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<sup>33</sup> For the UVR to grow at a constant value, the formula would be  $UVR_t = UVR_{15} * (1 + (i * t/d))$

housing system around the UVR, and therefore, the stability in assets and liabilities valuation rate denominated in UVR is a fundamental conditional for an entity.

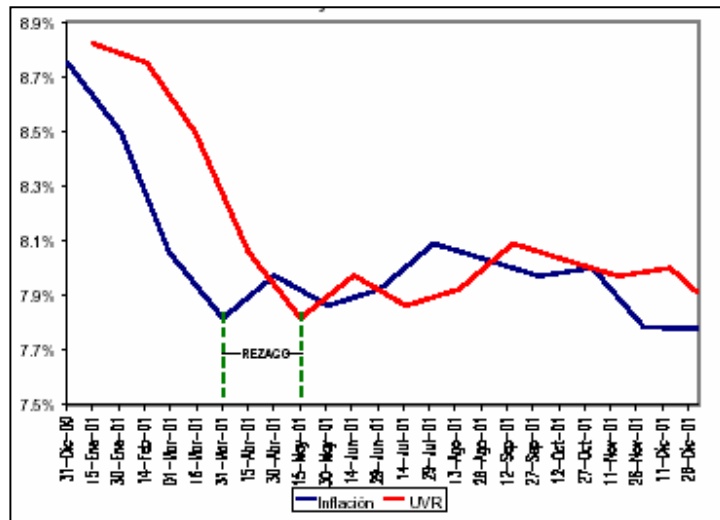
GRAPH 3.1 – DAILY UVR’S VARIATION FOR EACH METHODOLOGY



Source: Corfivalle

Finally, there is a lag of approximately 45 days in UVR’s growth with respect to the period in which inflation actually occurs. For example, April’s monthly inflation is used to calculate UVR’s variation in the period between the 16th of May and the 15th of June. This lag explains, for example, the fact that UVR’s increase between the 1 of January and the 31 of December of 2000 was 8.89% while annual inflation for that year was 8.75%. However, if the calculus of the variation is made between UVR’s value the 15th of August in 2001 (104.1122) and the 15th of February of 2000 (113.2263), the result corresponds to the same value as inflation rate of 2000 (8.75%). Graph 3.2 shows how in 2001 UVR’s value variation of 12 months follows the same behavior as inflation’s annual rate, with the mentioned lag.

GRAPH 3.2 –INFLATION 12 MONTHS AND UVR’S VARIATION 12 MONTHS



Source: Corfivalle

The Law of Housing also created the Consejo Superior de Vivienda, a government advisory organism for all issues related to housing and it was ruled that all CAVs should convert into commercial banks in a period of no more than 36 months. According to some experts, this is probably a mistake, because it will almost certainly mean that the CAVs will start diversifying away from housing finance and just develop a diversified loan portfolio like the commercial banks. They will then lose their specialist expertise, and the housing sector will suffer. (Sandilands, 2003) Also, credit entities were authorized to issue mortgage bonds denominated in UVR in order to finance long-term purchasing of new or used housing. For this purpose, new specialized societies were created, amongst which the government can participate through Fogafin<sup>34</sup>. To make more attractive this investment, the profits on these bonds are exempt of taxes if they meet some specific conditions. (Castellanos, 1999)

With respect to the criteria about long-term credit for housing, the new Law established that it should be denominated in UVR, whose remunerating interests would be charged at the end of the month and cannot be capitalized. Credits will have periods between 5 and 30 years, - the collaterals will be of first degree, amortization systems need to be approved by the Superintendencia Bancaria - and the credits can be prepaid partially or

<sup>34</sup> FOGAFIN is a public fund aimed to improve the risk level of the financial system.

completely without any sanction by the lending entity. The Law also imposes a limit to delay rate – maximum 1.5 times the remunerating interests-, and can only be charged over the delayed payments. (Corfivalle, 2002)

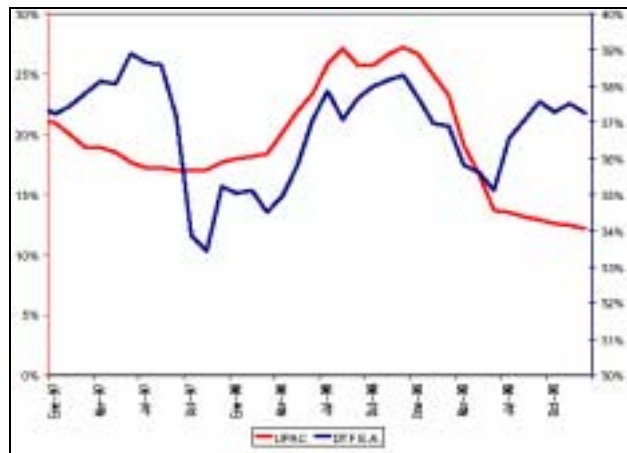
The creation of an accounting unit that preserves its value in real terms, responds to the necessity of an economy to perform long-term contracts, which could generate great losses to agents if denominated in legal currency because of changes in inflation's level of the economy, which lead to changes in interest rate's level.

As stated before, in Colombia, the UVR was designed originally to denominate in these units the long-term public debt bonds (TES). The risk that agents perceive in variations of inflation, and therefore, in nominal interest rates, increases as the period of the contract extends. A bond denominated in pesos and with a fixed interest rate would be very unattractive in the market. This would force the Central Bank to offer excessively high interest rates or simply to forget about the possibility of obtaining finance through this way. Instead, titles denominated in UVR, protect the investor against inflation variations, guaranteeing a positive interest real rate over the investment. By this way, if inflation goes up and therefore nominal interest rate increases, the nominal return in pesos of a bond denominated in UVR will grow as well.

Given the fact that mortgage credits are long-term contracts, UVR surged as an ideal option to denominate housing credits in these units. In this way, financial entities and mortgage debtors cover themselves against the risk that interest rates change radically during the period of the contract.

A fundamental difference with the functioning of UPAC housing credit system of the 1990s is that this unit included the DTF (interest rate) in its calculation. Therefore, a bond denominated in UPAC did not eliminate the risk of changes in inflation or in nominal interest rates. Even more, the abrupt increment of DTF value during the second half of the nineties translated, via brusque rises in UPAC's value, to mortgage debtors.

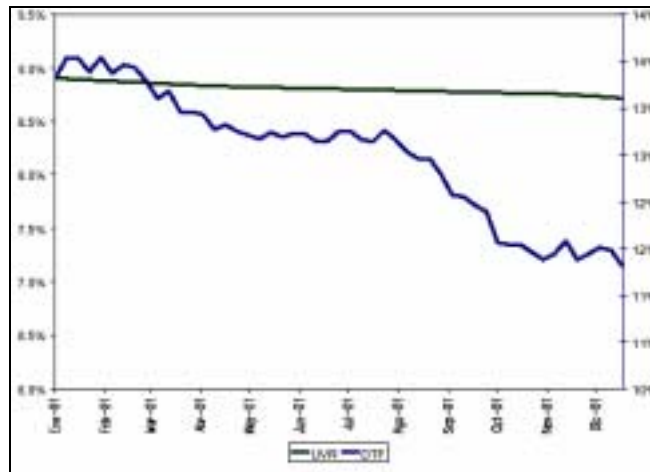
GRAPH 3.3 – DTF AND ANNUAL VARIATION OF UPAC



SOURCE: CORFIVALLE

In the case of debts denominated in UVR, on the contrary, its growth is tied to inflation evolution, which is the variable at which debtor's income (salaries and pensions) grows as well. Different from UPAC, UVR's growth rate keeps no correspondence with interest rate level.

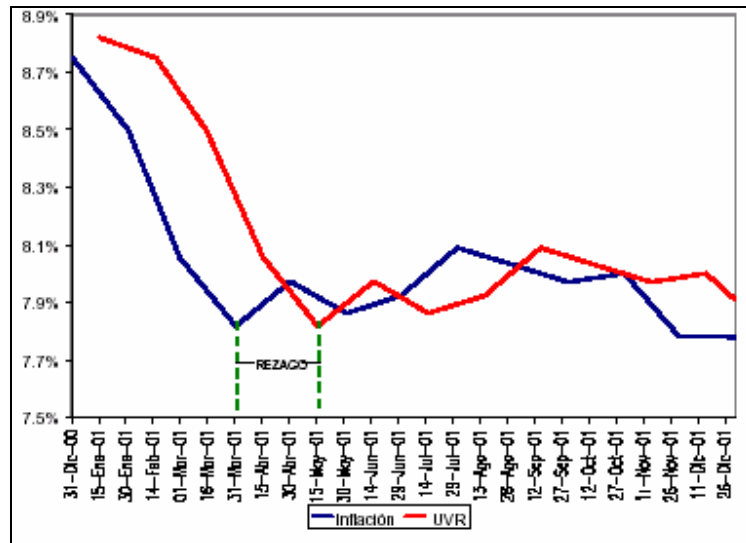
GRAPH 3.4 – DTF AND ANNUAL VARIATION OF UVR



SOURCE: CORFIVALLE

Anyhow, it is clear that, due to its respective definitions and the successive changes that UPAC suffered along its life, the UVR is a more appropriate mechanism to maintain the real value of the unit of account, as it can be seen in the following graph.

GRAPH 3.5 – 12 MONTH INFLATION AND UVR'S 12 MONTH VARIATION



Source: Corfivalle, 2002

Regardless of these advantages, UVR's introduction to the market has not been exempt of ups and downs. To many analysts, part of the difficulties in reactivating housing finance system has been linked to the practical difficulties that derivate from UVR's calculus methodology, and some proposals of changes have surged.

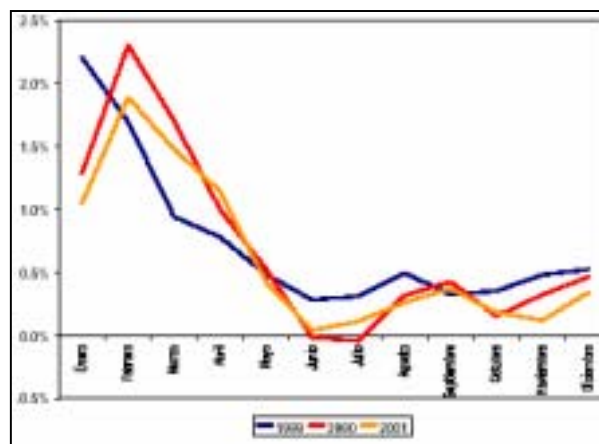
An important advance of UVR over UPAC is the fact that the growth of the unit in which credits are denominated was unlinked to variations in nominal short-term interest rates. However, there is still the problem for the credit entities of the mismatch between rates and periods. This means, whilst the assets in these entities (mortgage credits) present a constant return in real terms and defined for the long-term, the cost of liabilities that finance the assets varies continuously (DTF) and is of short-term (90 days).

This implies that in the case of DTF rises, the increment in the entity's liability cost is not compensated, as demonstrated before, with increases in asset's returns. Although it is evident that it would be desirable that entities would not have to confront this risk, is essential to note that it makes more sense that entities instead of debtors (as happened during last UPAC's years) are the ones confronting the risk. Without a doubt, financial entities count with more information, access to coverage and financial capacity to confront increments in interest rates, than natural agents and specially households, do.

In order for financial entities to avoid the mentioned disparity between rates and periods, housing finance system should evolve into a fund of housing credits that is made also at real constant rates and long-term. This is, long-term fundraising and in UVR in order to be able to lend equally in long-term and in UVR. In this way, the entity's intermediation margin would not be affected any more by changes in interest rate<sup>35</sup>, and the imbalance would be reduced.

The principal criticism to the UVR system is that this type of fundraising by financial entities (long-term and in UVR) is not viable given the seasonality in the returns that the bonds denominated in UVR exhibit. Being a unit that grows with monthly inflation, the UVR incorporates Colombia's inflation natural seasonality. This is high variations in January, February, March, and April, and low variations in the other months of the year.

GRAPH 3.6 – MONTHLY INFLATION (1999-2001)



SOURCE: CORFIVALLE

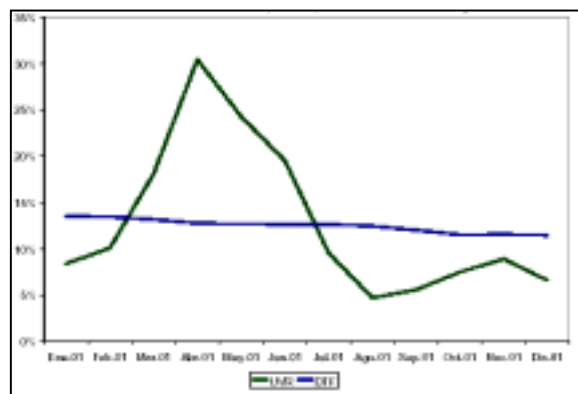
For the bonds denominated in UVR, and considering the 45 days lag explained before, this implies a monthly return in February's second half, in March, April and in June's first half, very superior to the rest of the months. The above could lead savers to invest their funds in bonds or accounts denominated in UVR from February to June, and then transfer them to other investment options. (For example, bonds linked to DTF). To institutional investors, this stationarity implies that their portfolios would exhibit high returns in some months and low in the rest. Although in the long run the real rate of the

<sup>35</sup> However, this fact does not guarantee a positive or constant margin for the entity. A deterioration of portfolio can occur, reducing the entity's intermediation margin.

bond is guaranteed, the presentation of a low return portfolio in some months is undesirable for these agents. Therefore, the demand for bonds denominated in UVR could be affected by these factors.

The following Graph shows the difference on returns that bonds in UVR has on each month, and helps understand why an investor would transfer for some months the funds into bonds DTF.

GRAPH 3.7 – MONTHLY RETURNS OF UVR AND DTF BONDS



Source: Corfivalle

As it is shown in the Graph, the rational behavior of an investor would be to invest his resources in January and February in bonds that exhibit DTF returns and transfer the money in March to a bond denominated in UVR until the month of June. For the last five months of the year, he would return again to investment with DTF returns. If in 2001 an investor had taken these decisions with his funds, the average return at the end of the year would have been 15.5%, instead of 12.3%, which is what he would have obtained in case of leaving the money the whole year in UVR bonds.

Clearly, the existence of an option that exhibits superior returns than market's average leads to an increase in the prices of UVR bonds in the months that this option is attractive. This reduces the profitability of the investment for those who buy bonds denominated in UVR in these months, and this will occur until it is equivalent to the alternative investment (DTF) and abolishing the possibility of arbitrage between the two investment options. (Corfivalle, 2002)

As a result, the option of switching from one investment to the other along the year guaranteeing a better return is not feasible, in the sense that UVR higher growth for some months will be compensated with a minor rate of return and the contrary will occur in months where UVR's growth is relatively low. Therefore, the difference in returns between investments that is shown in the above graph is confronted only for investors who maintain their investment throughout all the year. Although at the end of the year the return for both investments would be the same, institutional investors state that return's seasonality in UVR bonds translates to the valorization of their portfolios and, although in months like April they can obtain returns of 30% (in annual terms), in months like August the return falls even lower than 5%.

This is a problem not entirely solved, although some consensus has been reached in the sense that the overcoming of the problem necessarily needs to go through two things: on the one hand, the elimination of the effects of stationarity in inflation, probably by working with annual inflation; on the other hand, the development of some incentive (hopefully free of fiscal costs) so that institutional investors invest in bonds denominated in UVR.

The absence of a developed capital market in Colombia is probably consequence of structural problems related to macroeconomics instability and (also related to it) to the low rate of national saving, and not to the operational characteristics of UVR as a financial tool.

#### **4. A General View of UPAC System's Results**

As mentioned in the introduction, the original vision behind the creation of the index-linked housing finance system was to convert housing into a significant "leading sector" as part of an overall development strategy designed to accelerate Colombia's urbanization and industrialization, and to promote the mobility of labor from low-paying activities (including agriculture) toward higher paying activities (employment in housing and related industries) where the potential, or latent, demand was very great and which could be stimulated via the way in which index-linked mortgages could overcome the front-end loading problem for borrowers while at the same time increasing the flow of savings to the sector. (Currie, 1974).

The impact of this strategy and the associated UPAC system can be seen in two ways: first, from a productive point of view, looking at the figures of the construction sector and at a more general level, examining the evolution of GDP; secondly, from a social perspective, paying special attention to the impact on employment, both in quantitative and qualitative terms.

The table and graph already presented in Chapter 2 (Chart 2.1 and Graph 2.1) show the behavior of the housing sector, measured by the number of "licensed square meters of construction" This figure almost doubled from 1972 (year of the creation of the UPAC system) to 1988 (the last year in which the system enjoyed a reasonable level of stability). In 1975 the level of activity decreased, due to the effects of the international oil crisis, whose effects on Latin America manifested with one or two years lag, and also due to the ceiling established by the government to UPAC's index growth which reduced the flow of savings. As the graph also shows, some years later (1993, for instance) the number of licensed square meters became even greater, but within a much more unstable environment.

On the other hand, the impact may also be seen through the effect on employment, which, between 1972 and 1974, grew about 39.5%. According to estimates of the

National Planning Department<sup>36</sup>, in 1974 about half the direct employment generated by the building activity was attributable to construction projects financed by CAVs.

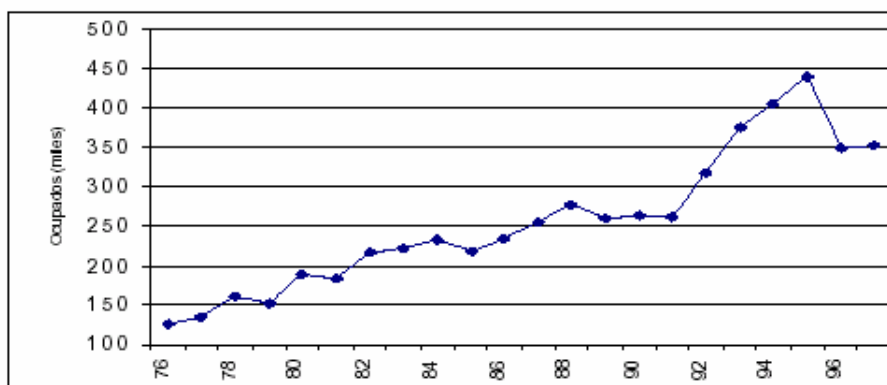
CHART 4.1 EMPLOYMENT GENERATED BY CONSTRUCTION ACTIVITIES

Year	Direct Employment in the C S	Direct + Indirect Employment in the C S	New Direct Employements	New Direct and Indirect Employements	Direct Employments Attributable to CAVs
1969	88146	176292			
1970	90389	189778	2243	4486	
1971	96607	193214	6218	12486	
1972	90262	180524	-6345	12690	
1973	116183	226366	25921	45842	50150
1974	125909	251818	9726	25452	56806

Fuente: CONPES, DNP-1223 UDRU, 1974, p. 37.

After suffering a temporary but important decline in 1975 (due to the combined effect of the international crisis generated by the petroleum crisis in 1973 and the measures already mentioned taken by the government) employment recovered in 1976 and from that year started growing continuously (although at different rates) until 1995, year in which the crisis of the system starts to manifest, and as mentioned in Chapter 2, led to its future disappearance.

GRAPH 4.1 – NUMBER OF EMPLOYEES IN CONSTRUCTION SECTOR (THOUSANDS), 7 CITIES, 1976 - 1998



Source: ENH, 1976-1998. Calculations DNP-UDS-DEE

<sup>36</sup> CONPES Document, DNP-1223 UDRU, October 1974, p. 37.

The graph shows the number of people employed in construction (direct formal employments) from 1976 to 1998. It shows an important growth from 1976 to 1981 (almost 70% in 5 years), when the number of employees starts to fall in this sector. Between 1991 and 1995, due to the big expansion of the sector, the number of jobs in construction starts to grow rapidly once again, reaching its peak in 1995, when the sector employed about 450.000 people. Since then, and until 1998, construction entered into a depression that was reflected in the fall of number of jobs in the sector, and that has maintained stable from 1996 up to a very recent date.

Given the characteristics of the sector, most part of the employment generated by construction was low-skilled labor. Giraldo (1992) estimated that from the total number of formal direct jobs generated by the UPAC system in 1990, 85% were non-skilled workers and 7.6% skilled employees, thus leaving a mere 7.4% for skilled workers and professional personnel.

For this reason, despite the boom induced by the government's policy, the salaries in the sector did not experience real upgrades for the most part of the decade. In fact, real salaries were under the existent level in 1971 in 6 of the 10 years between 1971-1980, although in the two last years they increased considerably, which allowed a real rise of 10% over the 10 mentioned years.

CHART 4.2 SALARIO REAL EN EL SECTOR DE LA CONSTRUCCIÓN  
PROMEDIO NACIONAL (1971-1980)

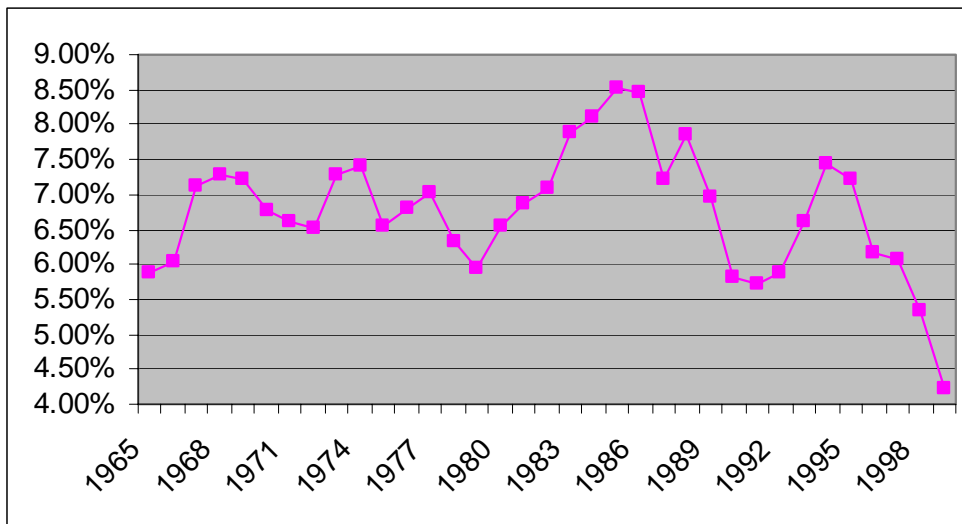
Year	Daily Salary (\$ current )	Daily Salary (\$ constant, 1971)	Index
1971	35.15	35.15	100.0
1972	40.47	35.67	101.48
1973	44.52	32.13	91.41
1974	55.08	31.71	90.21
1975	69.28	32.25	91.75
1976	79.29	30.78	87.57
1977	100.33	28.89	82.19

1978	135.38	33.36	94.91
1979	185.38	36.59	104.10
1980	249.00	38.67	110.01

Fuente: DANE, 1981

In aggregate terms, the strategy effect over the economy can be observed in Graph 4.2. As the graph shows, the growth of the share of the construction sector in GDP was significant. It went from a little less than 6% in 1965 to about 7.2% in 1975 and 8.54% in 1985, with a rather steady growth especially from 1979 on. After reaching its highest peak in 1985, it starts a declining trend with some small upturns, getting to a 7.21% participation in 1995.

GRAPH 4.2 CONSTRUCTION SECTOR'S SHARE IN GDP (1965 – 1995)



SOURCE: DANE - DNP

Now, having stated that the development strategy based in the UPAC system had some positive effects such as the already mentioned, it is important also to note that its results in terms of the potential important social effects -reducing housing deficit- did not materialize as expected.

In effect, as can be seen in Chart 4.3, quantitative housing deficit increased in a continuous way between 1951 and 1980, without showing any apparent improvement with the introduction of the UPAC. As the chart shows, this deficit passed from 14.5% in 1951 to 19.4% in 1964 (a deterioration of 0.4% per year on average), to 24.5% in 1974

(with a deterioration of 0.48% per year on average) and to 29.0% in 1980 (with an annual average deterioration of 0.75% between 1974 and 1980). These numbers suggest, that on the contrary, the greater worsening of housing deficit in the country occurred in the 1970s, precisely after UPAC's introduction.

CHART 4.3 URBAN HOUSING SITUATION 1951 – 1980

Year	Total Population	Urban Population	%	Urban Households	Urban Housing	DÉFICIT	%
1951	11.548.172	4.439.055	38.4	772.052	660.307	111.745	14.5
1964	12.478.818	9.090.955	52.0	1.674.197	1.344.063	330.134	19.7
1973	23.655.000	14.997.270	63.4	2.837.660	2.144.421	693.239	24.4
1974	24.384.000	15.668.912	64.3	3.008.998	2.255.219	753.779	24.5
1980	28.387.000	20.076.465	69.5	4.277.509	3.034.992	1.242.517	29.0

FUENTE DNP COMPES 1223 P. 13

Although many causes may have contributed to this situation, one that without a doubt had an effect was UPAC's lack of focus. In effect, as mentioned before, more than a sector program, what was sought with UPAC system was a national development strategy in which low-cost housing construction was not very interesting given that this type of housing (low-cost) is one with less multiplying effects over the rest of the economy. And since housing deficit concentrates mostly in low-income households (See Chart 4.4) it is possibly for this reason that the housing deficit situation already bad at the end of the 1960s worsened even more.

CHART 4.4 HOUSING DEFICIT DISTRIBUTION BY INCOME LEVELS

Total Household Income (Minimum Salaries)	Total Households	Total Deficit	Deficit by Level	Deficit Distribution
(0-1)	1151721	224371	19.5%	17.8%
(1-2)	1759059	204203	11.6%	16.2%
(2-3)	1225776	378154	30.9%	30.0%
(3-4)	801858	235716	29.4%	18.7%
(4-5)	571957	88236	15.4%	7.0%
(5-7)	671223	61765	9.2%	4.9%
(7-10)	476631	44118	9.3%	3.5%
(>10)	503775	23950	4.8%	1.9%

TOTAL	7162000	1260513	17.6%	100.0%
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Source: Henao (2001), Chart 2.

This fact was, without a doubt, one of the principal determinants for the change in housing policy with respect to construction sector in general and with respect to housing specifically, that started to be stated since the beginning of the 1980s, but only reached its consolidation at the end of the next decade, after UPAC's crisis, and with its replacement by the UVR.<sup>37</sup>

From the first half of the 1980s, the government starts to show more attention to the problem of housing deficit. For this reason, as shown in Chart 4.5, by the second half of the 1990s quantitative housing deficit had reduced significantly with respect to previous decade levels, falling continuously until reaching a level inferior to 14% in 2000.

CHART 4.5 – RECENT FIGURES ABOUT THE HOUSING DEFICIT IN COLOMBIA

Housing Deficit - Eight Metropolitan Areas, 1995-2000						
Concept	1995	1996	1997	1998	1999	2000
Households (1)	3291624	3399608	3553570	3646148	3763185	3882722
Housing Stock (2)	2719463	2856265	3054465	3172937	3217700	3360948
Informal Housing (3) **	270948	318888	306216	335836	309031	316253
Quantitative Deficit (1)-(2)	572161	543343	499105	473211	545485	521774
% Informal Housing	9.96%	11.16%	10.03%	10.58%	9.60%	9.41%
% Households in deficit	17.38%	15.98%	14.05%	12.98%	14.50%	13.44%

Source: DANE - Encuesta Nacional de Hogares, Preliminar Calculus DNP-DDUPRE-SV

\*\* Housing with structural deficiencies or lacks of public services and/or space.

In conclusion, the “UPAC strategy” generated important results for the country, but it also had some significant costs. However, this is an open discussion affected, no doubt, by ideological reasons.

The theoretical importance of construction as a suitable sector for pulling economic development is based upon three characteristics: a) construction is a non-tradable sector, which – among other things - means that its prices do not depend on external

<sup>37</sup> In 1982, when stating the convenience of introducing modifications to UPAC system, CONPES Document DNP-1940-UDRU-UPG, “La Financiación de Vivienda a través del Sistema UPAC”. Septiembre, 1982, p.2. states: “Due to demographic and economic tendencies, the country faces an increasing housing deficit, whose magnitude was estimated to be close to 800.000 units by 1980. When considering the different population income levels, it can be concluded that in 1980, 71.5% of the deficit was concentrated in 51.5% of the families who earned less than \$12.000 monthly that year”. In 1980, \$12.000 (current \$) were equivalent to two minimum legal salaries. (Note from the author)

market fluctuations, and therefore is less vulnerable to world economic behavior; b) it increases national input demand, turning the activity into an important link within a bigger productive chain, where sectors with different industrialization levels are included; and c) it allows a fast absorption of non-skilled labor hand.

This line of thought may be illustrated by Giraldo and Lopez (1987) almost passionate defense of the UPAC system:

“The creation of UPAC system marked, without a doubt, a milestone in the economic history of the country, not only by becoming a fundamental piece of economic policy within an inflationary context, but also that determined an unprecedented process of accumulation of capital (...) The UPAC system surges, in effect, as a response to the accumulation crisis and to the incapacity of economic authorities to impulse development within an increasing inflation atmosphere. It is clear that is not convenient to evaluate a monetary correction system as UPAC without considering the inflationary process in which it was embodied; evidently, if there were a non-inflationary economy, the adoption of a monetary correction system would not be justified. One of the most common discussions that UPAC system has had since its creation is if the constant value mechanism is in the origin of the inflationary process itself (...) The UPAC is not inflationary. It only correct, as seen, the effects of inflation. When this discussion is held it is necessary to distinguish between causality and precedent. Monetary correction, as it name states it, corrects but does not cause. This needs to be searched for in the structure and functioning of the dynamics of the economic process of society (...)”<sup>38</sup> Before finishing the chapter about UPAC’s system effects, its worth to stop (...) and search for the true nature of the system, since this has not been fully understood (...) Various analysts do not see clearly that UPAC, more than a financial interchanging mechanism, through the exclusive management of interest rate, turned saving formation into a much more dynamic process and revolutionized at the same time the whole financial system of the country. But this type of analysis studies wrongly only one side of the coin. Here is its reverse: the UPAC is not only a mechanism for fund-raising (...) but it encapsulates a whole series of complexities that the unilateral view of some economists has lacked to discover. UPAC’s system its inscribed within a macroeconomic strategy of accelerated development whose purpose is not, as might

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<sup>38</sup> Giraldo y López, op. cit., pp. 82 a 83.

appear, raise savings volume per se, but to serve as a springboard to channel this resources to the investment in a sector such a construction, whose characteristics sui-generis can by themselves accelerate the growth rate of the economy.<sup>39</sup>

Other economists, on the contrary, are skeptical to the alleged economy-wide benefits of using construction as the leading sector in an economic development strategy. Díaz et al (1993), for instance, after performing an interesting econometric exercise, come to the following conclusions:

“Using co-integration and auto-regressive vectors methodologies, we verify that the two series (Total GDP and Construction’s GDP) have unitary root. Granger’s test shows evidence of co-integration with an acceptance level of 95%, thus indicating that the long run non-seasonal components of total GDP and Construction’s GDP are associated. The causality relationship between the two series is from Total GDP to Construction’s GDP and just this way. With a confidence level of 99%, Granger’s Test indicates that the levels of construction activity respond to changes in GDP. The test does not accept the opposite hypothesis. These results show that both series share the same pattern of behavior and they do not evidence any long run reaction of economic growth to the level of construction activity. Variations in construction activity do not produce GDP increments or reductions in the lung run”<sup>40</sup>.

It is clear, then, that if the evidence presented by Díaz et al (1993) is true, then the whole rationale behind the UPAC strategy would be open to question.

Additionally, from a development perspective, it is possible that the strategy has had elevated opportunity costs, as suggested in Echeverry’s (1999) analysis when comparing Colombia’s strategy to Chile’s, the first based in a non-tradable sector and the second in a tradable one. This analysis indicates that the costs would have been highly significant not only because the yearly loss in GDP each year, but for the accumulative effect in time and the eventual externalities in human capital terms, given the use of unskilled labor by the construction sector and the use of skilled labor by most tradable sectors. On the other hand, from a financial perspective, the financial crisis

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<sup>39</sup> Ibid, pp. 82

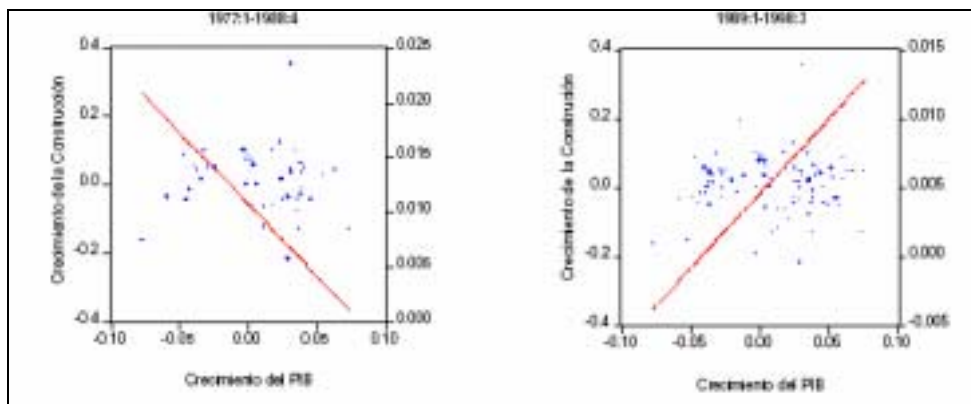
<sup>40</sup> Díaz, J., Gaitán, F., Piraquive, G., Ramírez, M. and P. Roda, “Dinámica de la Construcción entre 1950 y 1991”. In Revista de Planeación y Desarrollo, Volume XXIV, No. 2, August, 1993.

attributable to the disequilibria introduced by the UPAC system can be estimated to be approximately 4.5 percentage points of GDP, according to Cardenas and Badel<sup>41</sup>.

Finally, it is left to examine the possible benefit of the UPAC strategy related to its counter-cyclic character and therefore its potential capacity to reactivate economic activity. In this context, it is important to remember that UPAC strategy was launched precisely with this in mind, in a moment when it seemed indispensable to reactivate the economy in an inflationary scenario.

As shown by Echeverry et al (1999), between 1977 and 1988 construction shows the desirable property of being counter-cyclic (See Graph 4.3a). The correlation coefficient between GDP and construction cycles was estimated to be  $-0.04$  for the mentioned period. (See Chart 4.6) Instead, between 1989 and 1998, the relationship between these two variables inverts completely, showing a pro-cyclic trend and a positive correlation coefficient of  $0.59$ . (See Graph 4.3b and Chart 4.2)

GRAPH 4.3 – CORRELATION BETWEEN GDP AND CONSTRUCTION GROWTH



Source: Echeverry, 1999.

CHART 4.6 – CORRELATIONS GDP CYCLE, CONSTRUCTION CYCLE

Period	Correlation between GDP's cycle and Construction's cycle
1977:1 to 1988:4	-0.04
1989:1 to 1998:3	0.59

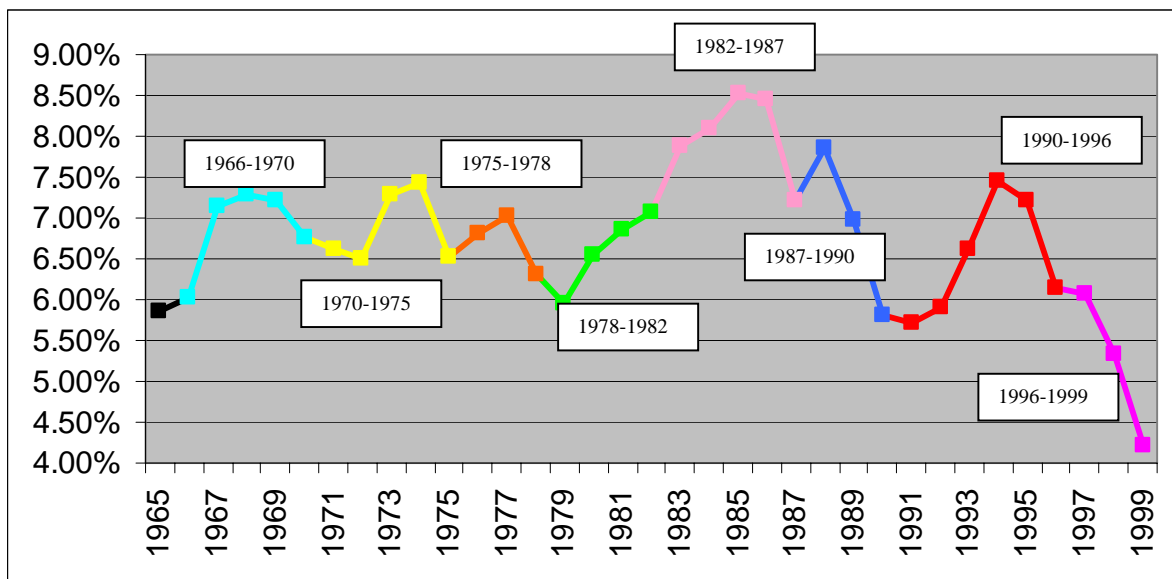
Source: Echeverry, 1999.

<sup>41</sup> Cárdenas, Mauricio, and Badel Alejandro, "LA CRISIS DE FINANCIAMIENTO HIPOTECARIO EN COLOMBIA: CAUSAS Y CONSECUENCIAS, 2003

In the same line, Cardenas et al (2003) show in their study that there is a strong correlation between GDP cycles and housing credit behavior. This suggests that housing credit has some macroeconomics consequences, given its impact over the construction sector and urban employment generation.

Taking construction's GDP growth series, it is possible to identify eight cycles between 1966 and 1999. A cycle has a recessive phase (when activity is declining) and an expansionary phase (when activity is augmenting). A cycle then, can be characterized by an upward movement followed by a downturn. The mentioned cycles can be identified in graph 4.4, marked each with a different color.

GRAPH 4.4 – CONSTRUCTION CYCLES 1966-1999



Source: DANE – DNP - CAMACOL

Now, having identified these cycles, it is possible to calculate the correlation coefficient between GDP and construction cycles in order to examine the character of the relationship between them, namely if it is pro or counter cyclic. The results of the coefficients can be observed in chart 4.7.

CHART 4.7 CORRELATION COEFFICIENTS GDP – CONSTRUCTION CYCLES

Construction Cycles	Correlation Coefficient
1966-1974*	-0.423520
1975-1978	0.131889
1978-1982	-0.515097
1982-1987	-0.568151
1987-1990	-0.229948
1990-1996	0.666206
1996-1999	0.905192

\*This period contains two construction cycles

As it can be seen in the chart, there is an identifiable trend in the correlation coefficient from negative values to positive ones, which indicate a counter cycle relationship in the beginning turning into a pro cyclic one as years pass. The first correlation coefficient (-0.42) shows a strong negative value, which can be interpreted as a counter cyclic relationship between GDP and construction cycles, precisely the kind of relationship that the government was hoping for when choosing construction as a leading sector. In the next cycle (1975-1978), the correlation coefficient shows a low positive relationship that can be explained because GDP grew at significantly high rates between 1975 and 1980 (5% on average) due to the period of coffee prosperity and also, the drug dealing economy had already started to have an appreciable effect. Given this fact, a positive but low relationship can be expected, because under the circumstances it is very possible that GDP's growth could overcome construction growth during those years, even with the measures taken by the government to stimulate construction. Therefore, inevitably, the relationship became pro cyclic for this period as GDP recovered although for different reasons than construction.

Thereafter, the following three cycles show again a negative correlation coefficient, returning to the expected behavior of the chosen sector. Nevertheless, the magnitude of this coefficient becomes smaller as years pass, meaning that for the last cycle in which the coefficient was negative, the relationship between variables was still counter cycle but to a less extent. The first three cycles that show a negative coefficient had a correlation of approximately -0.50, while the calculated coefficient for the last negative cycle (1987-1990) was -0.22.

After this period, the relationship between GDP and construction becomes consistently pro cyclic. The correlation coefficients start being markedly positive (0.66) for the cycle between 1990-1996. Clearly, by now the counter cyclic behavior of the two variables had turned around, eliminating therefore the possibility of continuing to consider construction as a leading sector. For the last cycle (1996-1999), the pro cyclic conduct intensifies even more, reaching a correlation coefficient of 0.91.

The described behavior between GDP and construction keeps strong correspondence to the evolution of UPAC's formula. Initially, when the formula was just introduced (1972) and was strictly tied to inflation, construction managed to show a counter cyclic relationship, and respond to the demands of reactivating the economy by being a leader sector. However, as time passed and changes were introduced into the formula (and also to the institutional legal framework as seen before), the system's stability started to be in risk, clearly affecting construction sector's performance. Here is when the variables show less counter cyclicity with a less negative correlation coefficient. In 1984, CDT's return was introduced by the first time in UPAC's formula, generating a severe distortion into the monetary correction system as it started to consider additional variables apart from inflation. By 1990, the government had distorted completely the formula giving almost equal weight to inflation than to DTF variation in the formula. At this point, the cycles start to show a very strong positive (pro cyclic) relationship, showing that construction was not an adequate sector to reactive the economy by itself.

Clearly, the counter-cyclical relationship between GDP and construction cycles became smaller and smaller as years passed. Between the 1970s and most of the 1980s the counter-cyclic component of the cycles was relatively strong, while at the end of the 1990s they show high pro-cyclic behavior. These results show how one of the principal virtues of UPAC's strategy, which was its capacity to induce growth, was lost through time. This happened as the UPAC formula passed from being the result of a political decision to an increasingly derived result of the free interactions of the market forces.

## 5. CONCLUSIONS AND RECOMMENDATIONS

From lived experience and from the analysis presented in the previous chapter, it seems clear that the capacity of a sector such as construction to impulse a global economic development process is, in the best case, limited.

According to the analysis provided by Díaz et al, a sector like construction does not have the capacity or the weight to move the economy as a whole. Global economic movement has a causative effect over construction, but not the opposite. According to other analysis such as Echeverry et al (1999), Cárdenas et al (2003) and the exercise done in this paper of analyzing the existent correlation between the cycles of construction and GDP's evolution, construction activity might have a counter cycle character but this fact is linked to government actions with an important fiscal cost. For this reason, its effect over the economy is necessarily limited, especially in countries with relatively serious fiscal problems, as it is Colombia's case over the last years.

How is it possible to reconcile these findings with the theoretical foundations and conceptual developments by Professor Currie and others that led to the adoption of the original UPAC strategy by Colombian government in 1972?

One possibility is that these theoretical previsions concerning the capacity of the construction sector to induce global economic development could not achieve its full potential as a result of the heavy income inequality existing in the country and the limited capacity of the government to sustain large fiscal costs. This situation determined (and still does) that the huge potential demand for housing could not convert into effective demand. The almost nil capacity of low-income households to save made it necessary to count with an important subsidy by the State or some other agent. In this way, the expected "filtration" effects from the index-linked housing strategy could not have a full manifestation in a country such as Colombia given the fact that most of the potential demanders lacked the funds to support such an investment as a house without external help. Therefore, given the government's fiscal problems (which obviously limited the quantity and magnitude of the subsidies) and the small financial sector of the time, effective demand was not enough to reach the necessary levels or "critical mass" to generate a strong enough effects over the rest of the economy. One indication that this

potential demand did not convert fully into effective demand can be seen by examining the evolution of housing quantitative deficit. Although in percentage terms important progress can be seen (passing from 24.4% in 1973 to 13.4% in 2000), quantitative housing deficit in Colombia continues to be high with more than 520,000 units deficit, only 25% less than in 1973 (693,239 units).

It is plausible then, that for the reasons mentioned, despite the correct and solid theoretical foundations about the capacity of the construction sector to induce global economic development, several studies such as Diaz et al (1993) do not find statistical evidence of causality relationship in the direction construction sector – GDP, although they find this relation on the contrary direction.

In this context, then, it should be clear that the comparison between the UPAC and the UVR that sometimes is pretended set forth a false dilemma, because in fact they are two different creatures.

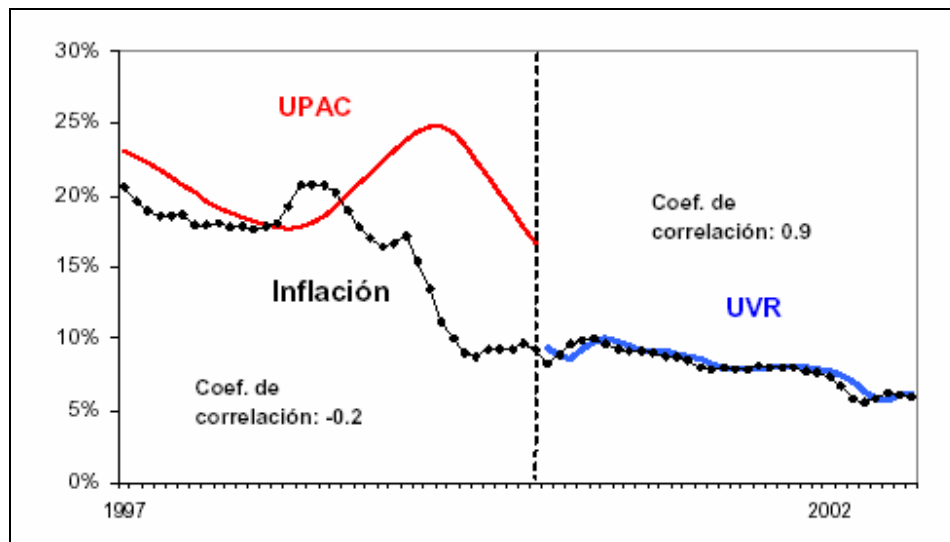
The introduction of UPAC was done as an essential component of a national development strategy to promote growth through a special impulse of the construction sector. In order to implement such a strategy, the government was willing to incur in some important financial and fiscal costs, because at that time it was supposed that the benefit/cost ratio was a favorable one. The magnitude of such financial and fiscal costs – due in part to the success of the system – was precisely what induced the crisis of the system, about twenty years after its introduction.

Looking back and learning from the experience, the UVR is a much more modest conceptual development. Instead of being, as UPAC, the basic financial tool for a national development strategy, the UVR is simply an adequate financial tool for a sector development strategy, not anymore oriented towards activating the whole economy, but only the construction sector and, more specifically, housing.

In fact, since from a financial point of view the UVR is exactly what the UPAC was in the beginning, the structural problems inherent to the UPAC model continue to exist in UVR's system.

The UVR has proved to be a good indexation mechanism, in the same manner that the original UPAC formula was. As can be seen in graph 5.1, while – due to the modifications of the formula - UPAC showed a very erratic behavior in its last years of existence, the UVR shows a very high and consistent correlation with inflation.

GRAPH 5.1 – ANNUAL VARIATION UPAC, UVR AND INFLATION



Source: Banco de la República; Cálculos DDUPRE-SV-DNP

Since from a financial viewpoint the original UPAC and the UVR are similar instruments, as long as the country does not have a developed capital market that allows to establish a consistent framework for fundraising and lending activities, there will always be the need that someone (most likely the government) subsidize the cost of the scheme, either by making some sort of direct transfer to the financial system or by assuming a portion of the risk. For this reason, it is imperative that attention is thrown into the fast development and consolidation of new fundraising mechanisms (securitization, for example) which are the only that, once fully developed, can really solve the term disparity problem.

The important thing to understand is that, from a structural point of view, nothing has really changed with the introduction of the UVR. For this reason, learning over what has been already lived, State's intervention should be much more selective now. Public resources should be allocated where they can have the maximum social impact in terms of welfare or "human development". In fact, perhaps the only justification for a public

subsidy to the housing industry is the effect, in terms of welfare or human development a housing solution has for a poor family.

Given this, the government faces two important problems concerning its role on the development of the housing sector.

First, the need to have a much more precise focus on low income housing so that whatever public resources committed to housing development go to the poor, where the main housing deficit exists and where the effect of a housing solution, in terms of welfare or human development, is maximized. The other problem is how to get a demand reactivation of the housing industry, getting back people's confidence, after a profound crisis that had devastating effects upon many families that lost their homes.

Fortunately, government's policy during the last years (since the beginning of the 1990s but in a more affirmative way over the last few years) has been aiming towards this direction.

With respect to the focalization of subsidies provided by national budget, it is important to mention that since 1991 a significant conceptual turn around occurred, eliminating subsidies to supply (basically granted to the ICT) and introducing subsidies to demand.

The past ICT was liquidated and the "Instituto Nacional de Vivienda de Interés Social y Reforma Urbana" – INURBE was created. To this new entity was assigned the responsibility to grant subsidies and the government abandoned the direct construction of housing, leaving this in private sector hands. Simultaneously it was created the denominated "national system of low-income housing" under the supervision of the Ministerio de Desarrollo Económico<sup>42</sup>, integrating in it entities in charge of granting subsidies or finance housing, including the INURBE, Cajas de Compensación Familiar, Caja Promotora de Vivienda Militar, Fondo Nacional del Ahorro and CAVs (Henao, 2001). In the development of this new policy, as shown in chart 5.1, between 1991 and 2000, the government has granted subsidies to almost one million families, representing

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<sup>42</sup> Today, this task is assigned to the Ministerio del Ambiente, which absorbed some of the previous areas supervised by the Ministerio de Desarrollo Económico, such as Water Management and Housing.

a value close to 3 trillion pesos. This value is equivalent to approximately 0.17% of the accumulated GDP of the period in reference.

CHART 5.1 COLOMBIA: SUBSIDIES TO LOW-INCOME HOUSING (1991-2000)

YEAR	TOTAL SUBSIDY (\$) BASE: YEAR 2000	NUMBER OF SUBSIDIES	AVERAGE VALUE OF SUBSIDY	SUBSIDY AS A % OF GDP
1991	134596	28496	4.72	0.10
1992	290067	80365	3.61	0.20
1993	300394	113331	2.65	0.20
1994	450992	153363	2.94	0.29
1995	437931	148763	2.94	0.26
1996	404994	135886	2.98	0.24
1997	443817	125193	3.52	0.25
1998	259575	65174	3.98	0.15
1999	288481	46892	6.15	0.17
2000	277068	44799	6.18	0.16
TOTAL	2804413	942982	2.97	0.17

Source: Henao, 2001. Chart 12, p. 25.

As can be seen in the chart, from 1998 the government introduces an important strategy of subsidies assignment, reducing the number of subsidies but increasing its value. This, with the purpose of improving the effectiveness of housing policy since with the previous amount, many poor family were still unable to acquire housing given their limited possibility of servicing the debt.

The new government policy (CONPES, 2002) reinforces this tendency, introducing new criteria for a finer focalization of the strategy that compromise over \$340.000 millions. With the purpose of refining focalization, the strategy defines three ranks of values for the houses to be subsidized, granting a subsidy inversely proportionate to the value of the house, as can be seen in chart 5.2.

CHART 5.2 – VALUES FOR HOUSING AND SUBSIDIES' AMOUNTS

Range of cost of the housing solution (in terms of mmls <sup>43</sup> ) (1)	Maximum value of the housing solution (\$) (2)	Magnitude of subsidy (in terms of mmls) (3)	Magnitude of subsidy (\$) (4)	Magnitude of subsidy relative to max. value of the housing solution (4) / (2)
0 – 50 MMLS	15.450.000	23	7.107.000	46.0%
50 – 100 MMLS	30.900.000	16	4.944.000	16.0%
100 – 135 MMLS	41.715.000	10	3.090.000	7.4%

Source: CONPES, 2002- Chart 5 - Author's calculations.

To sum up, the actual government's strategy is well conceived and oriented, setting State's intervention in the sector in a logic context and in tune with the fiscal possibilities of the country.

In the case of non-subsidized housing, the intervention mechanism that should be used is entirely different. Here, the main objective for the government should be to revert the lost of confidence by the users of the housing finance system, especially within potential buyers of middle-income, which was the most affected segment of the population by the UPAC crisis, and that given their economic condition, some kind of government help is justified. Clearly, in this case direct subsidies are not appropriate given the potential buyers level of income. Instead, the government should aim to minimize the risk for housing finance system users, so that the possibility of repeating UPAC's tragic crisis is eradicated.

The system proposed (CONPES, 2003) allows that the State covers housing debtors from UVR's variation over an expected target of inflation defined by the government. This mechanism will have the following characteristics:

1. The credit is assumed by the user in UVR's amortization systems approved by the Superintendencia Bancaria.
2. In parallel, the user can establish a contract with Fogafin that protects him against UVR's variation for the life of the credit (maximum period of 15 years).
3. The State offers coverage offered against the risk of disparity in rates with respect to estimated inflation. In other words, it guarantees to the potential debtor

<sup>43</sup> MLMS is Minimum Legal Monthly Salary

- a fixed nominal interest rate composed by the remuneratory rate plus a fixed inflation. In consequence, the figure will operate as a SWAP of inflation rate, where the government has previously determined the agreed rate of inflation.
4. This mechanism will be offered once to the users whose credits have been approved since the 1<sup>st</sup> of September 2002.
  5. For the credits approved and paid out between the 1<sup>st</sup> of September and the 31<sup>st</sup> of December of 2002, National Government has defined a long-run inflation target of 6%. For the credits in 2003 and 2004, the National Government will define a target of inflation every January.
  6. The values of the granted credits under this mechanism cannot exceed 130 MLMS and the value of the acquired houses cannot be superior to 323 MLMS.
  7. This coverage is offered to the first 40.000 credits granted over the next two years.
  8. State's coverage will be done through Fogafin.
  9. The required funds for the mentioned coverage will come from National Budget, for which an adequate budget mechanism will be designed.
  10. Annually, the debtor has the option to continue being part of the coverage system or canceling the contract.
  11. The mechanism does not generate the payment of premium by the debtor, and the operative cost of the SWAP mechanism by Fogafin will be assumed by the State.
  12. The mechanism can only be used in credits that support that buying of new housing.
  13. This is a mechanism to encourage the punctual payment by households. In case of a delay superior to 120 days, the user will lose the right to the coverage.
  14. With the purpose of guaranteeing regional equity, some indicative quotas have been defined for each region in the country. The Ministerio de Desarrollo will revise periodically the execution of the mechanism as function of the mentioned distribution.

This mechanism seems adequate, given that inflation in Colombia has entered into a phase which appears to be entirely controllable by monetary authorities, for which State's risk in covering misestimating is low. Also, the ceiling established fro the number

of covered credits allows that in case of “disaster” the fiscal impact can still be manageable by the government.

Finally, it is important to reiterate that, independently of the goodness of the intervention mechanisms anticipated by the actual government’s policy, probably the best and most profitable policy that the Colombian government could follow is the promotion of long-term fundraising schemes, such as securitization and housing leasing. In the extent that institutional investors assimilate these mechanisms, a new way will start opening to the formation and consolidation of a true capital market in the country, the only alternative that in structural terms, can alleviate financing problems of a sector such as housing.

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## ANNEX 1 – THE PROBLEM OF LONG TERM FINANCE IN INFLATIONARY CONDITIONS

As the time period increases, the uncertainty and degree of risk involved in the transaction increases as well. Also, the asymmetry in attitudes and expectations in inflationary conditions between borrowers and lenders increases as the period of the contract extends. This situation makes difficult and costly reaching long-term agreements, for example long-term debt contracts such as mortgage contracts.

To avoid these potential problems, financial institutions may introduce the scheme of varying the interest rate charged to long-term debts along the line of variations of short-term savers. The problem in the practice with this solution is that in high inflation economies, the burden of the initial payments (amortization plus interest) will be unsustainable for most individuals, given the fact that payments under high inflation regimes will consume a significant proportion of their income. Generally, financial institutions set a limit to initial debt service payments not to exceed 30% of borrower's income. This consideration reduces significantly the volume of borrowings in a high nominal rate scenario.

An example will be useful to illustrate this point. Suppose a mortgage loan of 100,000 pounds. And suppose also that the borrower has an annual income of 50,000 pounds. The interest rate set by the financial institution is 5%, and since there is no inflation, the real interest rate equals the nominal interest rate (5%). Suppose also that the period for the loan is 20 years, and the amortization is lineal. In this case, first year mortgage payment would be 10,000 pounds, which is 20% of the borrower's income. This is a reasonable proportion that is commonly accepted by financial systems.

Now, imagine an inflationary scenario, where inflation is 20%, so nominal interest rate would be 25% given that real interest rate is 5%. Again, mortgage loan is 100,000, borrowers income is 50,000 pounds, the contract term is twenty years and the amortization pattern is a lineal one. The first year mortgage payment would be 35,000 pounds (5,000 of amortization plus 30,000 of interests), which is 70% of the borrowers income. Clearly, in this situation no loan would occur, and the potential demand of a middle class agent will be repressed by the high initial mortgage

payments. This is known as the “front-end loading problem” or cash flow problem. (Sandilands, 1980)

Demand for long-term funds depends on both real and nominal rates for the reasons explained above. On the contrary, supply of loanable funds is related only to the real interest rate because people’s willingness to save is only influenced by what they obtain for their money, independently of what the inflation rate is. Therefore, inflation has a non-neutral effect on capital markets. (Sandilands, 1980)

One of the most important sectors that has suffered from long term financing problems has been housing. As a consequence, there has been a relative shortage of funds for housing and severe financing difficulties for borrowers in the initial periods of their mortgage contract in times of inflation.

#### The Role of Monetary Correction

Economies with controlled levels of inflation do not require monetary correction. However, as long as it exists, mechanisms to reduce inflation rate and to mitigate its undesired effects are necessary. One of the recognised mechanisms to serve these purposes is indexing.

Specifically referring to the issue of long-term debts, inflation causes extreme accumulation of real payments in early periods of mortgage and other long-term contracts when nominal interest rates are high. This situation imposes a rigorous restriction on nominal interest rate, which in turn may discourage voluntary savings in financial institutions specialised in long-term mortgage finance.

There are two alternatives that can alleviate this problem. The first would be for borrowers to renegotiate their debt periodically to obtain an augmented loan in order to be able to pay for the high interest rates of the early years. Clearly, this solution will only inject more uncertainty into the process, making it less likely for borrowers to commit.

A second, simpler and more effective alternative would be to charge the borrower a fixed real interest rate. This will require for the nominal remaining values of the debt to adjust in line with the rate of inflation, and will have the effect of spreading real

payments more evenly throughout the mortgage contract. This practice is known as indexing.

Indexing compensates for changes in general purchasing power of local currency, and therefore ensures that the real value paid and received by the parties to financial contracts is the same as that which would obtain if there were zero price inflation, with corresponding expectations. (Sandilands, 1980) With an indexed mortgage, the nominal value of the debt will usually increase (depending on whether the rate of inflation and, hence, the monetary correction applied to the remaining debt, is sufficiently high to offset the declining schedule of carrying costs that would have operated in the absence of indexing). In real terms, however, the schedule of the carrying costs on an indexed mortgage would decline as on an unindexed mortgage.

Demand for housing requires that adequate funds be available, as well as affordable. This means, easily serviceable, which depends on the schedule of repayments, and on the length of the mortgage term. The availability of funds is a reality when attractive incentives are offered to savers - and the competition that the housing finance system faces vis-à-vis other parts of the financial system. In this sense, the housing finance system should be given special protection, in order for the system to be sustainable. Given the fact that inflation has a non-neutral effect on capital markets, official controls should be imposed so that the housing finance system is in the position to offer attractively enough interest rates to savers. (Sandilands, 1980)

This is the great advantage of indexing systems under inflationary economies. Indexing mortgages allow for the possibility to financial institutions of offering attractive real rates of interest to savers by similarly indexing savings deposits and housing bonds.

Through this mechanism, the housing finance system can:

- Become self-financing, without having to rely on inflationary government subsidies.
- Reduce the number of defaults by borrowers associated with high and variable nominal interest rates
- Preserve the real value of its assets (loans), and thus, the real value of rotating capital fund as debts are amortised
- Compete much more effectively with other financial institutions for savings

Remove one of the main constraints on the level of real interests elsewhere, thereby helping to raise the overall savings rate in the economy. (Sandilands, 1980)

In all these ways, housing and urban infrastructure finance can be increased enormously and thereby satisfy the demand that so far had been repressed, i.e. by liberating the potential demand, which can be severely repressed (artificially) by the front-end loading problem.

However, for these mechanisms to establish in the practice, a sufficiently developed capital market is needed, where savers and borrowers can interact with similar periods in reference. For this reason, while in developed countries with capital markets well consolidated, the availability for housing finance funds is generally enough to meet the demand, developing countries where capital markets are incipient and where institutional investors are few, require government action for the securing of housing finance funds.

## ANNEX 2 – CHANGES TO UPAC'S FORMULA 1972-1999

Date	Norm	Entity	Adopted Methodology
July 18, 1972	Decree 1229	Gobierno Nacional	Previous quarter IPC's variation
May 24, 1973	Decree 969	Gobierno Nacional	Previous year IPC's variation
February 29, 1974	Decree 269	Gobierno Nacional	Previous 24 months IPC's variation
August 12, 1974	Decree 1728	Gobierno Nacional	Previous 24 months IPC's variation. Limit to Annual Growth 20%
August 21, 1975	Decree 1685	Gobierno Nacional	Previous 24 months IPC's variation. Limit to Annual Growth 19%
January 15, 1976	Decree 58	Gobierno Nacional	Previous year IPC's variation. Limit to Annual Growth 18%
March 27, 1979	Decree 664	Gobierno Nacional	Previous year IPC's variation. Limit to Annual Growth 19%
September 17, 1980	Decree 2475	Gobierno Nacional	Previous year IPC's variation. Limit to Annual Growth 21%
October 11, 1982	Decree 2829	Gobierno Nacional	Previous year IPC's variation. Limit to Annual Growth 23%
May 16, 1984	Decree 1131	Gobierno Nacional	Previous year IPC's variation plus 1.5% of the squared difference between inflation variation and CDT's (90 days) variation of the previous month.
January 24, 1986	Decree 272	Gobierno Nacional	Previous year IPC's variation plus 1.5% of the squared difference between inflation variation and CDT's (90 days) variation of the previous month. Limit to Annual Growth 21%
March 25, 1988	Decree 530	Gobierno Nacional	Previous year IPC's variation plus 1.5% of the squared difference between inflation variation and CDT's (90 days) variation of the previous month. Limit to Annual Growth 22%
July 7, 1988	Decree 1319	Gobierno Nacional	40% of previous year IPC's variation plus 35% of DTF's previous month average.
May 29, 1990	Decree 1127	Gobierno Nacional	45% of previous year IPC's variation plus 35% of DTF's previous month average.
July 4, 1991	Decree 1730	Gobierno Nacional	45% of previous year IPC's variation plus 35% of DTF's previous month average.
April 21, 1992	Decree 678	Gobierno Nacional	20% of previous year IPC's variation plus 50% of DTF calculated for the previous 8 weeks.
March 15, 1993	Res. 6	Banco de la Republica	90% of compound average of constant value saving accounts and constant value term saving certificates for the previous month. Limit of 100% of IPC's previous year variation
April 15, 1993	Res. 10	Banco de la Republica	Same or applying a rate of 19% annual effective, the highest.
September 9, 1994	Res. 26	Banco de la Republica	74% of DTF's moving average for the past 12 weeks.
June 30, 1995	Res. 18	Banco de la Republica	74% of DTF's moving average for the past 4 weeks.
March 15, 1999	Res. 6	Banco de la Republica	74% of DTF's moving average for the past 4 weeks. Moving average is to be calculated: 40% 4th week, 30% 3rd week, 20% 2nd, 10% 1st.
May 14, 1999	Res. 8	Banco de la Republica	DTF's moving average starts to depend on inflation's average of the past 12 months and of long-term DTF.