THE *REAL* PLAN: IMPACTS ON THE PRODUCTION, TRADE, AND CONSUMPTION OF BEANS

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Abstract

The objective of this work is to project Brazilian bean demand through 2005 and study the production and trade of beans in Brazil during the 1990s, using the introduction of the *Real* Plan as a reference point. In this paper, we estimate the relations between wholesale and retail bean prices in the city of São Paulo and the prices received by bean producers in the seven main Brazilian bean producing states. We also evaluate trade margins and perform production studies that consider harvest time, geographical distribution, and the main distribution flows. Econometric analyses were conducted using a two stage method: first, identifying causality—the market level at which price alterations most frequently begin in the event of any shock or factor; and second, determining how these alterations are transmitted—how intensely the market levels reacts to price shocks, which may be caused by a variation in demand, raw material supply, or trade inputs. Finally, future bean consumption was projected.

Key-words: beans, trade, consumption

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1. Introduction

Beans are both economically and socially important in Brazil. Though second only to India in bean production, 2% to 5% of Brazil's internal supply comes from importation - Brazil and Japan are the world's largest bean importers. Bean production in Brazil is both an economic alternative for cultivation on small properties and an activity providing employment to the less skilled rural work force.

In spite of beans economic and social importance in Brazil, studies of the bean economy are rare and limited. Most of the publications on the subject approach the situation in a specific local area or, at most, in few producing areas. There are practically no available studies relating production and consumption to macroeconomic events. The lack of comprehensive bean studies, and the consequent dearth of available information, has lead agricultural economists to consider beans "a complicated product".

This stigma also has other causes. For example, there are a profusion of variables which studies use to predict and justify the dynamic trade of beans in Brazil; but most of the time, they are used without a theoretical model to scientifically support their conclusions. Thus, alarming predictions about the development of production, trade, and supply of beans in Brazil are quite common, though the impacts are often milder than forecast.

Studying the society's behavior after the *Real* Plan's introduction is important because it altered the Brazilian economy in the mid 1990s. The Plan initially followed procedures to combat the inflation that had persisted through several former Brazilian economic plans. The first step the government took toward this objective was the implementation of new controls on the exchange rate, credit, and commerce. In order to stabilize prices, the exchange rate was controlled by a restricted conversion system, rather than the classic exchange rate "anchor" (Belluzzo, 1999). This strategy had been recommended in order to

open trade, and it was anticipated that appreciation of the Brazilian currency would impose competitive discipline on domestic producers, forcing them to improve productivity (Batista Jr., 1999). This was a liberal development project that, among other things, was intended to force production structures and productivity levels in Brazil's economy to move nearer the competitive level of more advanced economies.

The Plan succeeded in the battle against inflation; however, there are still doubts about its success where it concerns production. The changes brought about by the plan created insecurity in all sectors involved in the bean productive chain. Information gathering difficulties caused the bean producers financial loss, and they became more risk averse and less inclined to make investments in systems that could have made the bean culture safer and more efficient. Maybe this is one of the reasons why the average bean yield has remained at about 550 kg/ha while other crops have shown substantial production gains. The Plan also negatively affected the incomes of bean packers and retailers, hindering long-term investments that could have improved their business competitiveness.[3] These instabilities affected prices to the consumer, causing insecurity regarding their ability to purchase adequate supplies of good quality beans, a staple of the Brazilian diet.

The final objective of this work is to study the causes and effects of some relations along the bean productive chain that are especially related to production and trade. In order to achieve this goal, knowledge of consumer trends is fundamental. This subject has always been on the list of policies planners' principal interests; and in this new millennium - with new food manufacturing and trading technologies, increased participation of "global" fast food brands, expanded delivery services, and the consumers' heightened awareness of nutritional values - the interest has increased.

[3] Competitiveness is the ability of a company to formulate and introduce competitiveness strategies which could extend or conserve a sustainable market position (Haguenauer et al. 1996).

2. Method

Simple subtraction using the wholesale price paid to the producer is not enough to calculate a trade margin. One needs to track the raw material all the way to the final consumer, to know its origin, the intermediate transactions, storage time, and the equivalent units at various market levels.[4] In the case of beans, these parameters are practically impossible to determine with exactitude. The São Paulo market, for example, receives, in larger or smaller amounts, goods from several states and regions throughout the year. Losses vary according to season, origin, storage time, and weather conditions at the harvest time, and other factors. Thus, equivalent units were not considered in the calculation of margins. Some authors, such as Aguiar *et al.* (1994) do not consider these losses to be significant. Ferreira (2001) discovered that large wholesalers will support a maximum loss of 6%. Anyway, as no loss was considered, the margin values are overestimated.

Calculated for this study were the total margin (TM), the relative total margin (TrM), the absolute wholesale margin (WM), the relative wholesale margin (WrM), the absolute retail margin (RM), and the relative retail margin (RrM). The city of São Paulo was taken as reference for the wholesale and retail markets. The suppliers are the seven Brazilian states with the greatest bean production.

Econometric studies[5] of the variables were then performed in two stages. First, the meaning of causality was identified, that is, the market level at which price alterations began in the case of any factor or shock. In the second stage we determined how these alterations were transmitted or how intensely the market levels reacted in the case

[4] Along the route taken by agricultural products from the production unit to the final consumer, there may be either losses or the generation of by-products. Thus, at a determined level of the market, the amount of output may not be the same as the amount of input. The correction of these amounts for comparison purposes is accomplished through the concept of equivalent units.

[5] RATS software (Doan & Litterman, 1987) was used for the econometric procedures.

of shocks.

Before beginning the procedures described in the paragraph above, tests were run in order to detect the presence of a unit root in the economic series used in the work. We employed the Dickey-Fuller test - 1991 -, best known as the Increased Dickey-Fuller test (IDF). The application of this procedure in a series generated by independent stochastic processes became compulsory after Granger & Newbold (1974) showed the existence of spurious regressions in the presence of non-stationary series.[6] That is, the regressions may not present economic meaning even if they have significant t-tests and determination coefficients (R^2).

In this sense, we performed Akaike's (*Akaike information criterion*- AIC) and Schwarz's (*Schwarz criterion*- SC) tests to determine the number of lags in the equations. The second step was to perform a co-integration test, investigating any long-run balance relation between the two time series. In the following stage, correlation tests were performed in order to verify the degree of linear association between the variables. The exogeneity, or causality, test shows the market level at which leadership behavior can be observed, that is, what level the shocks come from.

The model proposed by Barros (1990) was used to calculate price transmission elasticity. It contains the following price transmission equations:

$$prevar_t = (1-\alpha)\,prevar_{t-1} + \alpha b_1\, preata_t + \alpha b_2\, preins(v)_1 \quad (1)$$

prevar = retail price
preata = wholesale price
preins(v) = input price of retail trade

[6] A process is called stationary when the average is zero and the variance is constant along time and the covariance is dependent only on the time interval and not the time for which the covariance is computed (Gujarati, 1995).

$$prepro_t = (1-\beta)prepro_{t-1} + \frac{\beta}{c_1} preata_t - \frac{\beta c_2}{c_1} preins(a)_t \quad (2)$$

prepro = price received by producer
preata = wholesale price
preins(a) = input price of wholesale trade

The period taken for the prices to be adjusted at the wholesale and producer levels was also calculated. In the estimate, an adjustment of 95% of the prices was considered. The expressions used were the following:

$$Pm(v) = \frac{\ln 0{,}05}{\ln(1-\alpha)} \quad (3) \qquad Pm(p) = \frac{\ln 0{,}05}{\ln(1-\beta)} \quad (4)$$

Pm(v) = period of time, in months, for 95% of the adjustment of retail prices to take place when there is an alteration in the wholesale price

Pm(p) = period of time, in months, for 95% of the adjustment of prices to take place at the producer level when there is an alteration in the wholesale price

Finally, the total and partial transmission elasticities between wholesalers and retailers were calculated using equations 5 and 6, and the total and partial transmission elasticities between wholesalers and producers were calculated using equations 7 and 8.

$$Eav(t) = b_1 \frac{preata(m)}{prevar(m)} \quad (5) \qquad Eav(p) = \alpha\, b_1 \frac{preata(m)}{prevar(m)} \quad (6)$$

$$Eap(t) = \frac{\beta}{c_1} \frac{preata(m)}{prepro(m)} \quad (7) \qquad Eap(p) = \frac{1}{c_1} \frac{preata(m)}{prepro(m)} \quad (8)$$

Eav(t) = total price transmission elasticity between wholesalers and retailers

Eav(p) = partial price transmission elasticity between wholesalers and retailers
Eap(t) = total price transmission elasticity between wholesalers and producer
Eap(p) = partial price transmission elasticity of between wholesalers and producers
Preata(m) = average wholesale price at the time
Prevar(m) = average retail price at the time
Prepro(m) = average price received by the producer at the time

Annual *per capita* consumption was calculated using data from the relevant year, is the result of adding the monthly harvest estimate to the amount imported. As we could not determine the stock or quantity designated for the seeds, this information was estimated in the calculation of apparent consumption. For stock of seeds, an average value of 300 thousand tones was used; the quantity or crop designated for seeds was considered to be about 8% of total production. Barros's (1987) equation was used to project consumption:

$$Q_t = \left(Q_o * (1 + e_y * r_y)^t * (1 + p)^t\right) \quad (9)$$

Q_t = Total amount demanded by the year at the given year
Q_o = Initial amount consumed in the year
e_y = Income elasticity of the given product demand
r_y = *Per capita* income growth rate
p = Population growth rate

Barros's equation (1987) can only explain the decrease in per capita bean consumption – which has been occurring continuously over the last decades – through the evolution of income. As there are many reasons for this decrease, a correction factor (FC) was introduced in equation 9 in the attempt to obtain a better adjustment. Using this correction factor, the calculated per capita demand was transformed, resulting in equation 10. According to the observation that consumption has fallen on average 1% a year in excess of the rate explained, the value of FC for Year 1 was 0.99; for Year 2, 0.98; for Year 3, 0.97; and so on.

$$Q_{mt} = \left(\frac{\left(Q_o * (1 + e_y * r_y)^t * (1 + p)^t \right)}{pop} \right) * FC \qquad (10)$$

Q_{mt} = *Per capita* demand in the given year
pop = Estimated population

Average total bean consumption during the 90s was used to obtain the initial quantity Q_o. Due to economic uncertainties specific to Brazil in the period under study, the calculation of the evolution of annual per capita income was made using alternative growth rates of 0%, 2%, 3% and 4%. If growth takes place without income distribution, a zero growth rate can be inferred. The population estimate was calculated in accord with IBGE[7] ' data (1996) and the growth rate was 1.12% annually.

In order to estimate the income elasticity of beans, information from the 1987 and 1996 Family Budget Survey (IBGE, 1991 and IBGE, 1998) and the following logarithmic function were used:

$$\log Q_{ij} = a + b * \log Y_{ij} \qquad (11)$$

Q_{ij} = Per capita amount of beans type i per income range j
Y_{ij} = Average income of range j

1. Analysis of Results

Table 1 shows that the states of Rio Grande do Sul, Santa Catarina, Parana, São Paulo, Minas Gerais, Goias, and Bahia produced on average 71% of total Brazilian bean production[8] in the period between January 1990 and December 1999. Nineteen ninety-six was

[7] IBGE - Brazilian Institute of Geography and Statistics
[8] We must point out that 20% of the national production consists of the common cowpea (*Vigna sinensis*). The consumption and production of this species are concentrated in the Northeast. In this area, about 60% is planted with cowpeas and represented about 50% of the nation's production

found to be the year in which these states participated the least in total production, with 63% of the country's total bean production; while 1998 was found to be the year in which these states participated the most when they accounted for 90% of production.

Table 1 also shows that in the period between 1995 and 1999, average yearly bean production relative to the 1990 through 1994 period decreased in the states of Bahia, São Paulo, Santa Catarina, and Rio Grande do Sul by 3%, 19%, 17% and 13% respectively, or 10.505 thousand tons, 56.785 thousand tons, 53.368 thousand tons and 21.008 thousand tons. Comparison between the same two periods showed that average yearly production in the states of Minas Gerais, Parana and Goias increased 7%, 18% and 12% respectively, or an increase of 23.585 thousand tons, 76.797 thousand tons, 15.240 thousand tons. On the whole, the average amount offered by these seven main producer states fell 1.3% or 25.774 thousand tons between 1995 and 1999 when contrasted to the 1990 to 1995 period.

More than offsetting these decreases was a 10% increase in the average yearly production of other states between 1995 and 1999, approximately 78.666 thousand tons. We verified that this performance was mostly due to production growth in Brazil's northeastern region, which, in the first period, 1990 through 1994, produced about 479.512 thousand tons and after 1995, increased annual average production to 584.701 thousand tons. The final result shows that total bean production grew about 2% after the *Real* Plan's inception in late 1994. We also observed that production appears to be adjusted to demand, as storage times were found to be short indicating that there is no excess product.

As to importation, Table 2 shows that in the 1960s, the amount of beans imported corresponded on average to 0.14% of the total amount consumed, in the 1970s to 0.66%, and in the 1980s to 1.11%. In the 1990s, importation increased to 3.8% of consumption. Focusing on the 1990s, the average amount imported in relation to the total consumption from 1990 to 1993 was 2.3%, increasing to 4.7% between

1994 and 1999. Therefore, imports as a percentage of total consumption increased 2.4% after implementation of the *Real* Plan. In absolute terms, the average amount of imports was 67.875 thousand tons/year in the first period and 157.183 thousand tons in the second period. This importation increase cannot be attributed solely to the country's commercial opening or the greater competitiveness of imported products, for one bean variety, the *Phaseolus vulgaris,* accounted for approximately 80% of the imports, characterizing it as the kind of bean which can compete in the Brazilian market.

There are micro-regions where production is significant and consistent; however, there can be failures when projections are made based on results from these regions alone. In other words, micro-region situations can have great impacts in the market, but the final market behavior depends on total productions from all regions.

Table 3 shows the average 1990s price received by bean producers in the seven main producer states. When the period is divided into two segments, from 1990 to1994 (before the *Real* Plan) and from 1995 to 1999 (after the Plan), we see that prices in the second period are 33% lower than those in the first period. The state of São Paulo presented the greatest producer price fall, and Rio Grande do Sul, the smallest decrease. However, this fall in prices was not enough to discourage producers as total production did not present a significant change.

Table 3 also shows that wholesale and retail prices in the state of São Paulo decreased in the second sub-period 33% and 25% respectively. We can also observe that wholesale participation in the retail price decreased, moving from 74.4% to 62.1%. In that period, the average participation of the producer in the wholesale price increased over the first sub-period, changing from 69.4% to 73.4%, while decreasing as a portion of the final price, moving 51.7% to 45.6%. Comparing this last result with Aguiar's finding that in the 1980s the participation of the producer was 63% of the final retail price (Aguiar,

et. al., 1994), we concluded that producer participation in the final product price has decreased approximately 18% between the 1980s and 1999.

The results forming the absolute and relative margins of wholesale and total prices are presented in Table 4. Comparing the behavior of absolute wholesale margins from January 1990 to June 1994 and from July 1994 to December 1999, we observed a reduction from the first to the second period except in São Paulo, where there was an increase of 1.7%. The average value of the absolute margin decreased about 44% after the Plan, moving from R$ 34.35 in the period before the Plan to R$ 19.05 after. In relative terms, only the state of São Paulo presented an increase, 32%. In the other states, there was only a small reduction of about 2.7%, that is, the margin tended to be preserved. Given that the total margin is the proportion of the expenses consumers pay due to intermediation, we conclude that consumers' expenditure has been practically constant.

Table 4 shows that after the *Real* Plan, the trade margin between retailers and producers decreased about 15.85% in absolute terms and the average value fell from R$ 72.92 to R$ 61.36. We must point out that the state of São Paulo, differently from other states, showed an increase of approximately 2.6%. In relative terms, there has been a tendency toward increase, with margins moving from 48.8% before the *Real* Plan to 54.0% after. This increase can be explained by positive changes in the retail market and a concurrent increase in consumer demand. Since 1995, Brazilian retail vendors have modernized their points of sale, induced suppliers to create product presentation alternatives, and, most importantly, offered a better product.

Contrary to the change in the total trade margin after the implementation of the *Real* Plan, which fell in absolute value and increased in relative value, the trade margin between wholesalers and retailers saw increases both in absolute and relative trade margin values (Table 5). Since 1995, the absolute value of the trade margin between

bean wholesaler and retailer increased about 10.3% and the relative values increased 12.3%.

Supermarkets, important retail distributors of beans, have caused a reduction in the number of agents in the trade process. However, the margin increase can be justified by the services provided by these sale units and the improvement of the final product, now sold as trademarked, packaged merchandise, thus assuring minimum quality standards.

The presence of the unit root was detected in all variables other than the São Paulo retail price variable and was characterized with an integration of order one I (1).[9] Before this result, the models involving the variables that presented unit root were established in the first difference. This measure makes the analysis of price transmission equations more difficult since the parameters do not indicate the percentile variation; rather, they indicate a price growth rate.

The co-integration tests evaluated the relations between monthly average prices received by producers in the seven main producer states, as well as the relations between these prices and the prices in the city of São Paulo's wholesale and retail markets. At the 10% of significance level, all relations were co-integrated. Therefore, the prices received by producers in the states have a long-term relation. This means that there is an economic interconnection among producers in the seven states, and/or there is interaction between market levels. We also observed that there is a contemporary correlation of 0.99 between the retail prices found in the city of São Paulo with those found in other large Brazilian cities.

The causality tests were performed with a significance level of 10%. Picture 1 presents the identified causality relations. In the Picture, the arrows indicate the state from which the price alteration for producers arises and the state the alteration influences. Few causality relations

[9] An integration order of one variable represents the number of times a series needs to be differed to become stationary.

were found between the seven main producer states. This result may be attributable to the unavailability of precise producer pricing data which necessitated the use of less expressive average monthly prices. Picture 2 addresses the predominant sense of causality from wholesalers to producers and from wholesalers to retailers.

Table 6 presents the results of our analysis of price transmission between the wholesale and retail markets. It shows that the number of months for 95% of the adjustment to take place (if >1, no number entered). We observed that total price transmission was lower between 1995 and 1999 than between January 1990 and June 1994. Table 6 shows that before the *Real* Plan, an increase of 10% in the wholesale prices caused an increase of 7.4% in the retail price; after the Plan the impact was reduced to 6.4%.

Table 7 presents the results of price transmission elasticities between the city of São Paulo's wholesale market and the producers in the seven main producer states. Prices between all states other than Parana and São Paulo showed no adjustment lag. When there is a price alteration of 10% in the city of São Paulo's wholesale market, the readjustment of prices received by producers is 3.1% in Santa Catarina, 4.0% in Minas Gerais, 5.7% in Parana, and 5.4% in Goais. Producers in São Paulo and Bahia receive almost the entire impact of this 10% wholesale price change as prices received by the producers in these two states adjusted 9.0% and 8.4% respectively. Analysis of the study's two sub-periods showed that producer price readjustments after a 10% change in the city of São Paulo's wholesale market price were less after the *Real* Plan's implementation in the states of Rio Grande do Sul, Santa Catarina, Parana, Minas Gerais, and Bahia. Before the *Real* Plan, the average transmission value in these states was 4.5%; after the Plan this value decreased .2%, to 4.3%. In the states of São Paulo and Goias, on the contrary, the shock caused by the *Real* Plan caused price transmission values to increase .1% and 1% respectively.

Picture 3 shows per capita bean consumption during the 90s.

Over the last four decades, we observed that per capita bean consumption tended to decrease 1% a year. However, this trend is not linear but oscillates from one year to another, demonstrating the consumption value's instability. Picture 3 shows an anomalous sudden increase in consumption in two different years followed by a period of reduced consumption that tended to average out the consumption value.

Table 8 shows the projected bean demand values derived using Barros's expression (1987) modified by the correction factor. Bean income elasticity of demand, calculated through equation 11, was – 0.042, presenting similarity to Hoffman's (1995) results. We observed that consumption decreased in the four scenarios, which considered per capita income growth rates of 0%, 2%, 3%, and 4%. Variations are small within each scenario though coherent to the magnitude and sign of the elasticity and consistent with the historical trend toward decreased consumption. It is not clear when the trend will end, but further evaluation of the factors which cause and influence this behavior may provide the answer.

Although average Brazilian bean consumption has fallen to 8.4 kg/person in major cities like Belem, Belo Horizonte, São Paulo, Curitiba, Porto Alegre, and Goiânia (Family Budget Survey 1995/96-IBGE, 1988), this average is still higher than that found in many other countries. Unfortunately for bean producers, rural families are consuming less and less beans as they adopt the urban standard (Hoffman 1995). We infer that even with this tendency of decreasing consumption, beans will continue to be an important part of the Brazilian diet for many more years; therefore, we suggest that the pace of research investigating alternatives to improve the bean productive chain be hastened.

2. Conclusions

The results from this study allow us to conclude that the political changes which took place in the early 1990s and the impacts of the *Real*

Plan affected Brazilian bean prices at three market levels. These price changes spurred bean production in Brazil's northeast and altered production in the traditional producer states while leaving their production patterns intact. After implementation of the *Real* Plan, the quantity of imported beans suffered some alteration, especially in the case of black kidney beans.

Through study of the trade margin, we conclude that the division of consumer spending between wholesalers and producers remained practically constant between 1990 and 1999. It was apparent that the role of the intermediate sector in lessening price shocks became stronger over the same period. In the first two years after the *Real* Plan's inception, there was a temporary increase in bean consumption, which then returned to pre-*Real* Plan levels after 1996. The projection for the 2000 to 2005 period is that there will be a tendency for per capita bean consumption in Brazil to suffer a slow reduction.

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Annexes

Table 1 – Total annual production of beans in Brazil in the main producer states and in other areas in the period of 1990-99 (in 1000 tons).

YEARS		Main producer states							Subtotal		Others	Total
		BA	MG	SP	PR	SC	RS	GO	Quant	%		
1990		227.1	293.4	259.5	352.0	260.9	125.4	118.9	1627.6	72.0	636.0	2273.6
1991		359.2	333.2	203.7	470.7	320.0	76.4	121.5	1855.0	65.1	1009.8	2994.8
1992		449.1	287.4	404.4	399.5	288.0	285.0	113.2	2226.9	77.4	649.3	2876.3
1993		313.6	362.0	291.4	574.4	276.0	**109.1**	125.2	2051.9	83.3	411.2	2463.1
1994		303.3	367.3	283.9	333.6	358.4	190.4	144.6	1881.9	66.9	1062.5	3044.4
1995		251.6	344.0	250.1	509.1	316.9	159.4	92.5	1923.8	66.0	1034.2	2958.1
1996		317.4	336.6	190.0	515.1	274.8	107.9	114.2	1856.2	63.6	1058.3	2914.6
1997		469.6	379.5	199.8	429.2	245.9	123.1	168.2	2015.6	69.5	883.9	2899.6
1998		229.9	320.5	238.0	514.5	188.1	137.9	154.1	1783.2	89.9	419.9	2203.2
1999		331.2	382.1	281.1	546.2	210.8	153.1	170.7	2075.5	73.0	765.7	2841.3
	90/99	325.2	340.6	260.2	464.4	274.0	146.8	132.3	1943.8	71.0	793.1	2736.9
A*	90/94	330.5	328.7	288.6	426.0	300.7	157.3	124.7	1956.7	72.1	753.7	2710.4
	95/99	319.9	352.5	231.8	502.8	247.3	136.3	139.9	1930.9	69.8	832.4	2763.3

Source: Systematic Agricultural Production Survey (IBGE, 1990...), adapted by the authors.

A* = average

Table 2- Quantities (in 1000 tons) of imported beans and percentage regarding internal production in the period of 1960 to 1999.

Years	Decades							
	60		70		80		90	
	Quant	%	Quant	%	Quant	%	Quant	%
0	0.000	0.00	1.700	0.07	34.800	1.72	70.300	2.83
1	0.200	0.01	2.100	0.07	5.600	0.20	88.600	2.94
2	0.158	0.07	1.200	0.04	3.500	0.10	57.700	1.73
3	0.200	0.01	13.900	0.52	3.700	2.18	54.900	1.85
4	0.000	0.00	1.400	0.05	60.500	2.13	156.400	4.35
5	0.800	0.03	3.700	0.14	15.300	0.57	189.500	5.06
6	15.454	0.62	52.700	2.31	95.000	3.48	160.100	4.45
7	11.770	0.41	81.800	3.07	35.000	1.42	157.400	4.60
8	6.685	0.24	7.600	0.28	10.000	0.34	189.700	7.26
9	1.352	0.05	0.700	0.03	25.000	0.94	90.000	2.93
Average	3.798	0.14	16.680	0.66	29.340	1.11	121.460	3.80

Source: Systematic Agricultural Production Survey (IBGE, 1990...), adapted by the authors.

Table 3 – Average prices received by producers from the seven states, and wholesale and retail market prices in São Paulo. Values in *Reais*, deflated for January 2000.

States	Period			%
	Jan/90-Dec/99	Jan/90–Jun/94	Jul/94-Dec/99	Variação
RS	56.04	64.19	49.37	-23.08
BA	67.71	84.71	53.39	-36.97
MG	69.71	84.28	57.79	-31.43
SP	73.40	95.14	55.61	-41.54
PR	56.66	70.07	45.70	-34.77
SC	53.06	63.65	44.38	-30.27
GO	68.17	84.52	54.79	-35.13
		Averages		
Producers	63.50	78.08	51.57	-33.95
Wholesalers	89.20	112.43	70.20	-33.56
Retailers	135.06	150.99	112.94	-25.20

Source: CONAB*, Emater-RS*, Economical Information (1990...), *Departamento Intersindical de Estatística e Estudos Sócio-Econômicos* (1990...), adapted by the authors.

* data from eletronic publications received by e-mail

Table 4 – Absolute and relative trade margin of the wholesale market and total and relative trade margin of the retail market.

States	Period	Wholesale*		Retail**	
		Absolute	Relative	Total	Relative
RS	Jan/90-Jun/94	48.25	37.43	86.81	54.55
	Jul/94-Dec/99	20.83	29.86	63.56	55.03
SC	Jan/90-Jun/94	48.79	38.65	87.35	55.31
	Jul/94-Dec/99	25.82	36.28	68.56	59.63
PR	Jan/90-Jun/94	42.37	36.49	80.93	52.30
	Jul/94-Dec/99	24.51	34.48	67.24	59.51
SP	Jan/90-Jun/94	17.29	14.95	55.85	36.47
	Jul/94-Dec/99	19.59	19.74	57.32	51.03
MG	Jan/90-Jun/94	28.15	20.81	66.72	41.79
	Jul/94-Dec/99	12.41	17.65	55.14	48.35
GO	Jan/90-Jun/94	27.91	23.61	66.48	43.27
	Jul/94-Dec/99	15.41	21.09	58.15	51.44
BA	Jan/90-Jun/94	27.72	26.90	66.28	43.94
	Jul/94-Dec/99	16.81	23.15	59.54	53.29

Source: Research Data

* Total margin (TM) = Pv – Pp e Relative total margin (TrM) = (Pv – Pp)/Pv

** Wholesale margin (WM) = Pv - Pa e Relative wholesale margin (WrM) = (Pv – Pa)/Pv

Where: Pa = wholesale price; Pp = producers price; Pv = retail price

Table 5 – Retail absolute and relative trade margins

Margins	Period		
	Jan/90 – Dec/99	Jan/90 – Jun/94	Jul/94 – Dec/99
Absolute	40.86	37.01	45.56
Relative	31.91	24.72	37.80

Source: Research Data

Table 6 – Partial and total price transmission elasticities – wholesale/ retail - period 1990-99

Period	Elasticity[1]		Time
	Total	Partial	
Jan/90 – Jun/94	0.74	-	-
Jul/94 – Dec/99	0.64	-	-

Source: Research Data

Table 7- Partial and total price transmission elasticities – wholesale/ producer - period 1990-99

States	Period	Elasticity		Time
		Total	Partial	
RS	Jan/90 – Jun/94	0.16		
	Jul/94 – Dec/99	0.13		
SC	Jan/90 – Jun/94	0.31		
	Jul/94 - Dec/99	0.28		
PR	Jan/90 - Jun/94	0.60		
	Jul/94 - Dec/99	0.59		
SP	Jan/90 – Jun/94	0.92	0.20	1.73
	Jul/94 – Dec/99	0.93	0.16	1.49
MG	Jan/90 – Jun/94	0.33		
	Jul/94 – Dec/99	0.32		
GO	Jan/90 - Jun/94	0.54		
	Jul/94 – Dec/99	0.64		
BA	Jan/90 - Jun/94	0.87		
	Jul/94 – Dec/99	0.83		

Source: Research Data

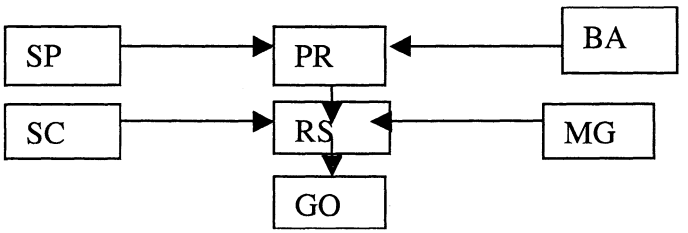
Table 8. Bean demand projection, 2000 to 2005.

Year	Total consumption (1000 tons)				Per capita consumption (kg/inhabitante)			
	0%[1]	2 %[1]	3 %[1]	4 %[1]	0%[1]	2 %[1]	3 %[1]	4 %[1]
2000	2721.72	2606.26	2605.12	2603.98	16.40	15.71	15.70	15.69
2001	2726.56	2525.65	2523.44	2521.23	16.24	15.04	15.03	15.02
2002	2731.12	2447.54	2444.32	2441.10	16.07	14.40	14.39	14.37
2003	2735.40	2371.84	2367.68	2363.53	15.91	13.79	13.77	13.74
2004	2739.39	2298.48	2293.44	2288.42	15.74	13.21	13.18	13.15
2005	2743.08	2227.39	2221.53	2215.69	15.58	12.65	12.61	12.58

Source: Research Data

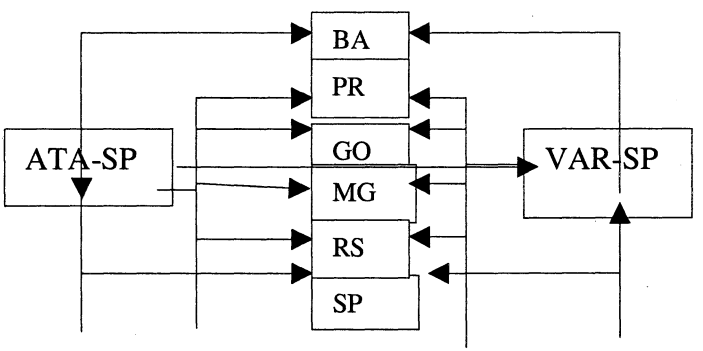
1 = scenarios for the per capita income growth rate

Picture 1. Causality Relations between the prices received by producers from producer states



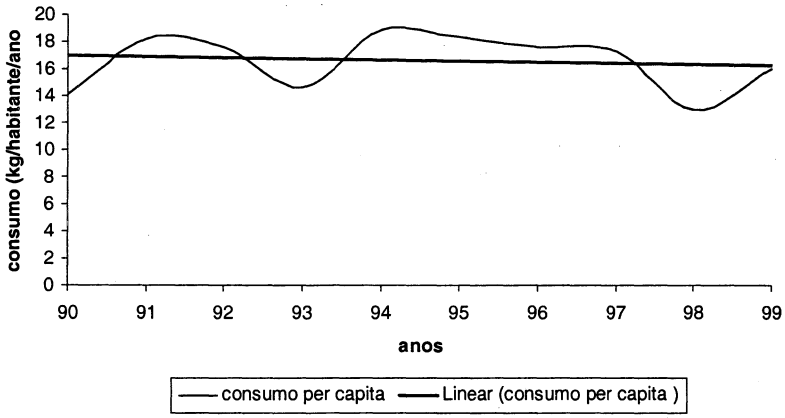
Source: Research Data

Picture 2. Causality relations between the states and the wholesale and retail markets of São Paulo.



Source: Research Data

Picture 3. Annual apparent per capita consumption of beans in Brazil from 1990t o 1999.



Source: Systematic Agricultural Production Survey – IBGE (1990...), IBGE (1996), adapted by the authors.