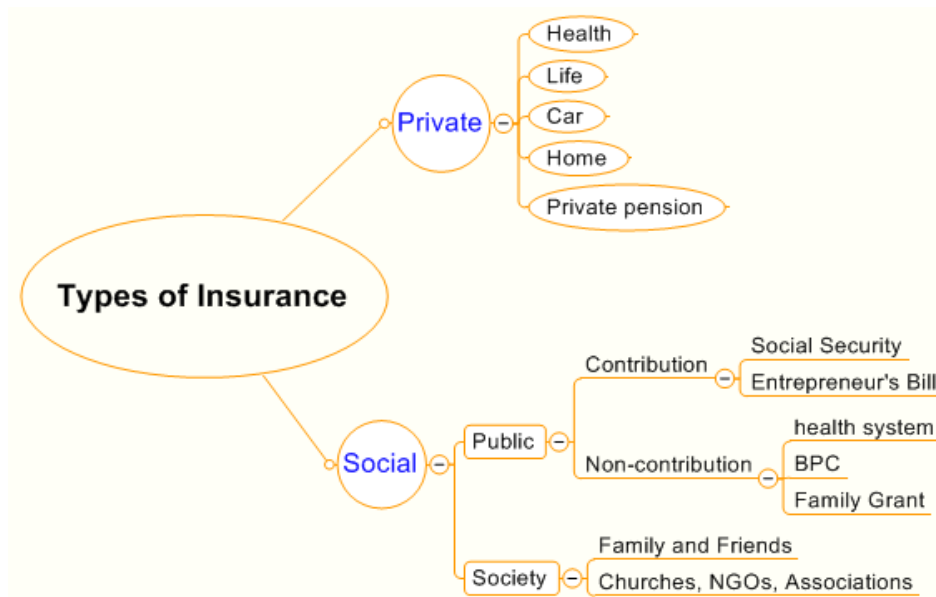# "Microinsurance: Income Risk, Social Security and the Demand for Private Insurance by Low-Income Families"

1. Objective

The objective of this study is to analyze the demand for private insurance by the low-income population aiming at the development of an emerging industry of microinsurance in the country. Microinsurance improves the ability of low-income individuals to cope with frequent fluctuations in their incomes and other risks. Neri (2000) estimates that the probability of entering poverty is 8.2% between two consecutive months; and 9% between two moments 12 months apart. In its turn, the role of microinsurance in protecting the adopted living standards depends on how developed the various segments of the financial market are (assets, loans and insurance) and on social security to cushion negative shocks. The evaluation of the microinsurance effects on well-being, and the demand for different types of microinsurance require an analysis of the dynamics of the individual revenue process and an assessment of substitutes and complementary institutions that condition the respective financial behavior. On the other hand, Brazil has a fairly developed financial system but still not geared towards the poor, especially in what concerns the insurance industry. Finally, the Brazilian government provides a relatively developed social security system considering other countries of similar revenue level. This requires a private industry of microinsurance well attuned to new business opportunities for people with upward mobility in need of protection to maintain the standard of living they have recently attained as well as to move down the income scale in the provision of insurance to income levels it had never reached before. This overlap of effects and changes in opposite directions requires an empirical work to guide the companies that want to explore the microinsurance market in Brazil.

The provision of insurance against uncertainty is present in various dimensions of people's lives, such as provisions related to illness, unemployment, accidents, theft, and death among others. We talk about insurance purchased in the private market and the so-called social security, including mechanisms of protection offered by the State and social networks within the society.

The case of public-based social insurance, it is worthwhile differentiating the contributory from the non-contributory ones. Examples of the first type are found in work-related accident insurance and maternity leave from the INSS (Brazilian Social Security Institution). Examples of non-contributory forms of public insurance are the National Health System (SUS), the Bolsa-Família (Family Allowance Program), the Continuous Cash Benefit (BPC) and unemployment insurance. In society, the basic unit of risk sharing is the family, supplemented by relations of friendship and help from non-family members.

Discriminating between different insurance expenses included in the Family Budget Survey (POF) will help identify the different forms of insurance. The first challenge is to identify complementarities and substitution between various types of public insurance, family protection and private insurance. We will do a cross-reference analysis of components of different types of insurance and the demand for private insurance. In other words, we will observe to what extent the presence of other private, public and family devices to reduce risk, affect the private behavior of insurance purchasing. For example, to what extent the contribution to public pension systems affects the demand for specific private insurance such as health or life insurance. Another challenge is to incorporate the effects of different types of risk into the demand for insurance cover such as those associated with unemployment, age, violence etc. Regarding family relations, we will work with the concepts of household per capita insurance expenses, and on an individual basis, as extreme scenarios with mechanisms of risk diversification within households. During the research, we will study in detail the relationship between insurance demand and income in order to understand the potential of

microinsurance considering changes in income distribution and in the supply of products better suited to the low-income population. The work is composed of central sections as stated below:

2. The Reasons of the Insurance Consumer: Theory

3. Definition of Microinsurance

4. The Market for Microinsurance

5. What are the main determinant factors in the demand for Microinsurance?

6. 7. Substitution and Complementarities between Different Types of Microinsurance

8. Breakdown of the Demand for Microinsurance

Research Site

The research site www.fgv.br/cps/microsseguro/ offers a broad database with interactive and user-friendly devices for data searching.

2. The Reasons of the Insurance Consumer

The purpose of this section in the light of the economic literature is to make a brief conceptual description of the motivations behind the behavior of the demand for different types of insurance by individuals. The appropriate basis for analysis of all real and financial assets and services seen as a whole is the inter-temporal choice theory, which analyzes the dilemmas between the future and the present time in a context of uncertainty. We discuss extensions of this basic inter-temporal apparatus to model the individual decision to purchase different types of insurance throughout the life cycle. According to the vast literature on financial behavior of households, the demand for savings / insurance would be induced by some fundamental factors beyond smoothing consumption over time. Some of these factors found specific reasons in the literature on savings (or self-insurance), which, if applied to the understanding of the demand for insurance, could lead to policies with specific characteristics, namely:

- **Precautionary reasons**, in a situation of uncertainty about income or expenses in the future, one can opt for health insurance, unemployment insurance, life insurance;
- **Car**, **property** and productive assets **insurance** related to indivisible assets of high unit value especially for the poor in a context of a credit constraint;
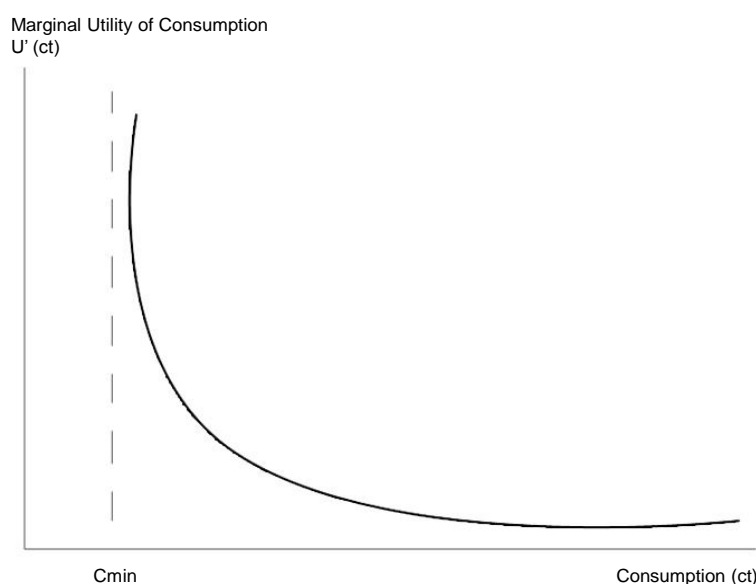
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- **Complementary private pension** plan acts as an important protection against the reduction of work-related income and the impact of health-related problems on the financial situation of the elderly;
- **Life insurance** covers living expenses of the spouse and children facing the risk of the policyholder's death.

These reasons are enhanced in the case of low-income individuals. Not to mention that the poor in Brazil tend to be more susceptible to volatility as far as income is concerned (Neri et all 1999). However, low-income individuals represent a small number in the insurance market, either because they lack knowledge about the services offered by insurers, or because insurance companies lack knowledge about poor informal customers, due to the difficulty of observation and good databases about it. In addition, because the values involved are low, the recovery of fixed and registration costs is difficult. These factors should support the case for the development of an infant microinsurance industry in the country.

a) Protecting Consumption

The demand for insurance derives from uncertainties that affect the well-being of people. Since insurance provides resources that will be available in the future in the event of adverse conditions, the decision on acquiring insurance or self-insurance through savings is also related to the nature and extent of uncertainty. The idea is that in bad times, when consumption levels are low, the consequences are much worse than in good times, when the consumption levels are high. Therefore, a drop in consumption close to subsistence levels is greater than the gains in the case of positive events. Poor people should be prepared for adverse conditions, demanding, if possible, insurance in the market, or self-insurance through savings. In this sense, these financial instruments should not be seen as luxury services.

Survival Constraint

Marginal Utility of Consumption
U' (ct)

Cmin

Consumption (ct)

The more uncertain the future income is, the greater the demand for insurance or self-insurance and the lower the present consumption of other goods and services. This precautionary motive is strengthened by the existence of restrictions on credit. The possibility to borrow in bad times is an alternative that provides certainty.

A side effect of the stabilization of individual risks is the reduction of the demand for private insurance. The same type of argument can be applied to the provision of social insurances by the State or the actual macroeconomic stabilization. For example, the Constitution of 1988 universalized the access to health through SUS whilst providing job stability to public servants jobs thus reducing the demand for specific insurances such as health and credit insurances, respectively.

b) Life Insurance

An important source of uncertainty is related to the moment of death of the individual. The higher life expectancy is, the lower the periodic consumption made after retirement will be for a given level of resources. Therefore, how much to save for retirement depends on the degree of uncertainty about how long people will live. In the case of altruism, people want to demand life insurance to guarantee the standard of living of their spouses and descendants. Given the uncertainty about the time of death.

c) Complementary Private Pension

Saving for retirement derives from the individual desire to maintain a stable pattern of consumption over a life cycle. As a result, individuals give up a share of consumption during their working age in order to stabilize the pattern of consumption in old age, when a fall in work-related income happens due to the retirement or increased costs because of higher health risks in old age. There are factors that affect preferences, needs and the actual work-related income over the life cycle. More frequent adverse health conditions of the elderly result in precautionary effects and explain the increased demand for insurance in the later stages of the life cycle. Family size is another factor, as consumer-spending power will reach its peak in middle age inhibiting the demand for insurance up to then.

d) Real Estate and Auto insurances

Capital accumulation to purchase indivisible assets, represented mainly by real estate and automobiles, results from the fact that the flow of individual monthly income is not sufficient to purchase indivisible assets of high unit value. This situation is induced by the lack of perfect credit markets, which create liquidity constraints.

Insurance of specific assets would result from the interaction of two factors: the indivisibility of assets and imperfections in the credit market. Individuals without credit in the event of an adverse shock would have to build up resources on their own over a period of time until they are able to purchase the indivisible asset. Similarly, people who want to start up a new business are often frustrated by the lack of access to capital markets, being forced to do early financial accumulation and purchase property protection.

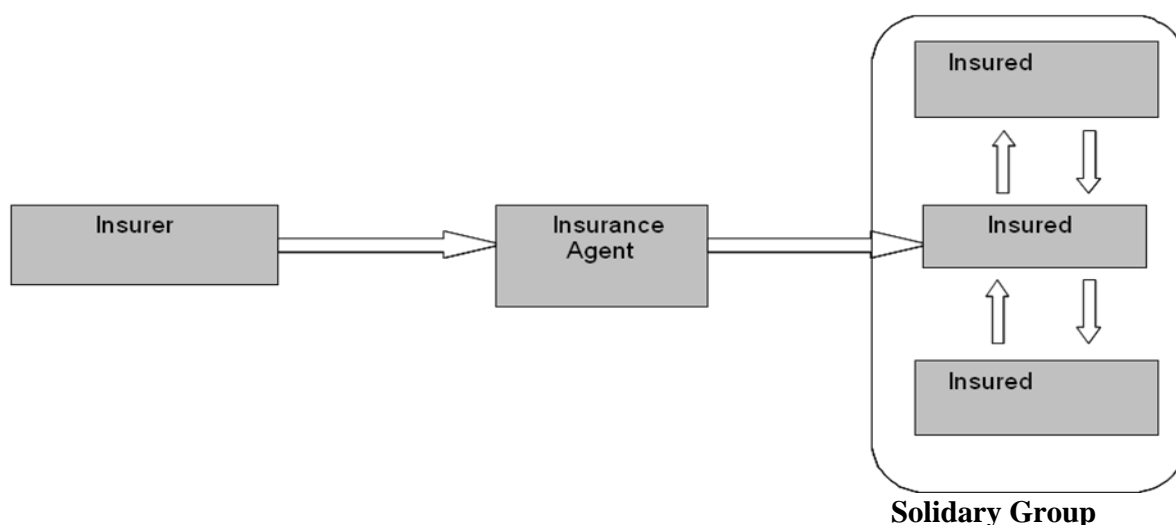### 3. Definition of Microinsurance

The key variable for the definition of a micro-insurance market is the income of the individual and not the type of the product offered. In other words, the prefix micro is a better adjective for the target group rather than a noun to define the financial service provided. Microinsurance fits into the field of microfinance, providing insurance to customers not served by the traditional financial sector. Microfinance refers to a range of diverse financial services, including microcredit, micro-savings, mortgages, remittances of immigrants in addition to microinsurance, to name just the main ones. Other examples of microfinance initiatives are the provision of banking services through retail shops (.e.g. grocery stores).

The key for the success of microfinance is to develop technologies to provide sustainable financial services to informal poor clients, such as viable channels of distribution of insurance to reduce the transaction costs of small loans and overcome the fixed costs associated with low value policies.

The relationship between insurance companies and policyholders is marked by asymmetry of information in two categories: adverse selection and moral hazard. The first involves the lack of information of the insurer about the insured (how honest he is, how responsible, etc.). In its turn, the moral hazard involves a lack of information of the insurer about the type of behavior that the insured may have under insurance protection. The existence of asymmetry in the evaluation of contracts provides a small number of insurance covers in relation to the need of people. A very common strategy explores repeated interactions between insurers and policyholders: the bank provides increasing insurance premiums over a period of time, conditional on the non-occurrence of claims in previous periods and refusing the renewal of insurance if a more extreme case occurs.

One of the secrets of microinsurance success is the loyalty of customers, which is gained by institutions' trusting their customers and providing good services to them. It is necessary to know the customers in depth and to seek products that meet their needs. An important feature would be the direct and personal contact between insurance officers and its customers. It is important to consider the cost of monitoring the insured. When it comes to small insurance, these expenses can become so large that they do not justify the provision of insurance. Then, the creation of solidary groups of insurance, similarly to what happens in microcredit can help to keep these costs down. A complementary solution is to transfer the cost of monitoring to a third party such as an insurance agent. Employees, who preferably are paid according to their performance, following up the insured help to enhance the various incentives towards various players.

Fundamental Players in Microinsurance

Solidary Group

Another important aspect is taking advantage of economies of scale and of scope used by public policies. For example, credit institutions could use access to the record system of social programs, such as Bolsa Familia, benefiting from an incurred costs to identify the low-income population. Another possibility is to combine microinsurance with other public policies such as using income from public pension and revenue transfer programs as collateral.

Defining Microinsurance in Brazil

As we said, the market for microinsurance is not defined by the amount involved in the insurance operation, but the income of its potential consumers. This definition has fundamental importance for the empirical part of the project. A natural candidate to define the target audience for microinsurance is the use of fractions or multiples of the minimum wage, which is not the most appropriate index, since the minimum wage value has suffered successive adjustments over time (e.g., a real gain of 44.7% since 2003). Therefore, when we use the minimum wage as a parameter we get the false impression of constant real value over time, and we put the focus on the microinsurance market in second place to unrelated discussions of public policy. There is also a strong concentration of mass of the individual income distribution in multiples (or accurate fractions) of the minimum wage not only in the labor earnings from formal and informal employment, but specially from contributory and non-contributory social programs (pensions, unemployment insurance, BPC (Loas) etc..). For that reason, if there is a small adjustment to the real value of the minimum wage (let's say by

0.00000001% real, i.e. virtually zero) can cause large variations in population around the cut line used due to the effect of the new value of the benefits granted.

We suggest incorporating the definitions of economic classes developed by the Center for Social Policies at Fundação Getulio Vargas (CPS/FGV) for a few reasons:

i) It generates the division of classes E, D, C and A / B, and it is already present in the culture of private companies. The CPS/FGV classification of classes is close to the classification of ABIPEME, but it is directly expressed in per capita household incomes, which is the unit of this project. As the CPS/FGV has generated periodic updates on the estimates concerning the size of these classes using the PNADs and PMEs.

ii) The definition of income classes by the CPS/FGV incorporates regional differences in costs of living that affect the purchasing power of present and potential insurance consumers. Class E of the CPS/FGV class system matches the definition of poverty used by the institution since 2000. Since there is no official poverty line in Brazil, the CPS/FGV definition of poverty is used by official bodies such as the Ministry of Finance and the Ministry of Social Development. The criterion for access to Bolsa Família (Family Allowance Program) today is 137 reais per family per capita each month, which is relatively close to the CPS/FGV regional poverty lines, which are on average of regionally adjusted figures 137 reais. In other words, it is relatively close, but not exactly equal to the values of ellegibility criteria to the Bolsa Família.

The database of the project calculates all statistics for levels of accumulated income of 1 minimum wage, 2 minimum wages and 3 minimum wages, as well as classes CDE, DE and E, C, D, AB in isolation, in order to allow each one to address the various levels of the microinsurance segment and its relationship with the total market. We also created a device that allows everyone to simulate the percentage of the population is below each income value. See http://www.fgv.br/ibrecps/RETC.M/Lorenz/index.htm.

This group or income classification helps to differentiate among strategies according to the strengths and weaknesses of each segment. For example, in class E we explore the complementarities with the Bolsa Familia Program, using databases and distributed income. In addition, typically for classes D and C, we explore of the possibility of using social benefits to pay the insurance and even credit of premiums in the event of losses[1].

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[1] For an extension of the economic class used encompassing other dimensions such as productive assets and possession of durable consumption goods and housing see http://www3.fgv.br/ibrecps/cpc/index_eng.htm

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The participation of the class CDE with 83.83% is comparable to 3 minimum wages per capita at the time of the POF, which represents 84.68% of the population. In other words, the absolute difference in size between the two criteria is relatively small.

To summarize what has been illustrated in this work, the calculations were based on household per capita income, but expressed here as total household income from all sources per month, at December 2008 prices: Classes E up to R$ 804, D up to R$ 1,115, C up to R$ 4,807, and AB upwards.

4. The Microinsurance Market

We try to measure the effective demand for insurance and microinsurance, using microdata from the Family (household) Budget Survey (POF / IBGE). In 2002 and 2003, the IBGE made an external survey and collected information from 48,470 households, covering a sample of 182 thousand individuals. The purpose of using POF is to outline the characteristics and profile of individual and family expenses with different insurance products (including the access, total expenses) for various segments of the Brazilian population. We focus our analysis on the expenses for people over 15 years of age, who have answered the questions in the expenses questionnaire.

a) The Insurance Market

The average rate of access to insurance in this population is 16.79%. In other words, the fraction of the population who has at least one type of private insurance, as indicated in the survey questionnaire, such as health, life and car insurance, private pension funds and other types of insurance. Health insurance is the most widespread type, covering 12.94% of the population over 15 years of age, followed by life insurance 4.31%, car insurance 2.95%, pension funds 0.45% with the portfolio complemented by other insurances 1.41%.
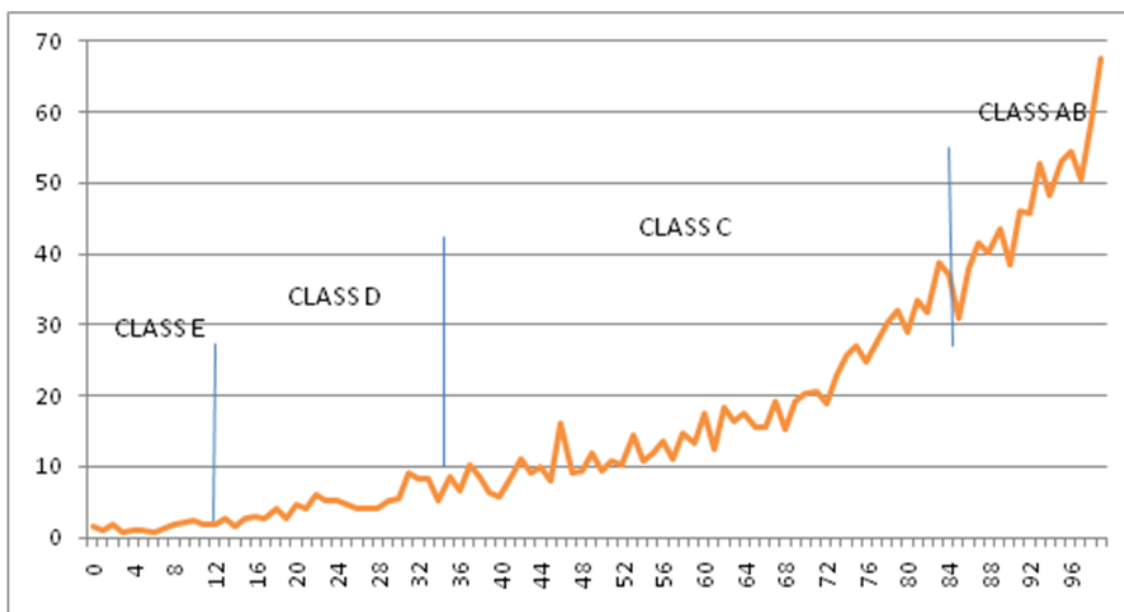
Alternatively, if the metric used is the amount of expenses at the general level of prices in December 2008, each Brazilian over 15 years of age spends an average of R$ 23.96 per month in insurance, and R$ 16.79 in monthly installments of health plan, R$ 3.22 in car insurance, R$ 2.17 in life insurance, R$ 1.03 in private pension and R$ 0.75 in other insurance. That is, 70.1% of the expenses on insurance are allocated to health plans.

b) The Microinsurance Market

Our focus is on the so-called microinsurance. We began with a general approach to microinsurance looking at the distribution of insurance throughout the income distribution
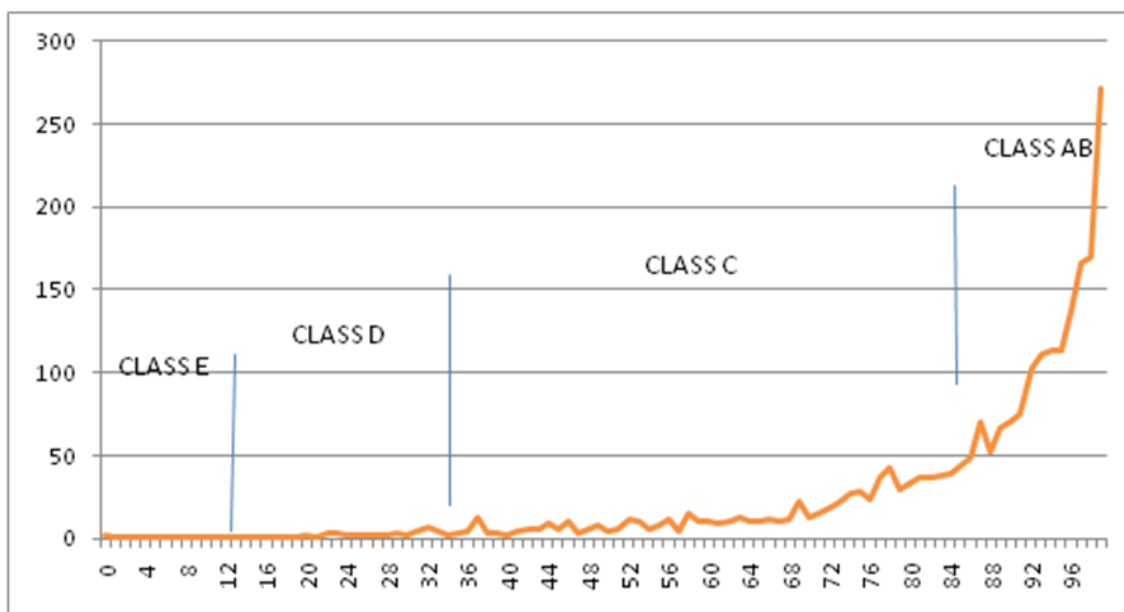
pyramid, we ordered the incomes from the poorest to the richest, and then we divided it into one hundred equal pieces. The two graphs below show the evolution of expenditure per hundredths. In other words, what would be the access to and spending on insurance in the margin in each hundredth of the distribution of household income per capita.

Marginal Rate of Access to Insurance per Centiles of Income Per Capita -%

Source: CPS/FGV from the POF/IBGE's microdata

Value of Marginal Expense in Insurance per Centiles of Income Per Capita -%

Source: CPS/FGV from the POF/IBGE's microdata

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The goal of the graphs above is to provide an idea about how the demand for insurance changes according to different income levels. The analysis of expenses at the margin is used to analyze the relationship between income per capita and the different types of insurance. For example, if we set the focus on the poor under the CPS/FGV poverty line, corresponding to class E following the methodology of the same institution, the access rate is 1.44% and the average monthly expense on insurance is R$ 0, 55. The income on the border between classes C and D of these variables corresponds to 1.93% and R$ 0.66. If we consider classes C, D and E taken together as a target audience of microinsurance, the access rate and the average expense would be 10.77% and R$ 8.55, respectively. These figures are the most fundamental in this exercise to be kept in mind. In the boundary between classes C and B, these respective numbers would correspond to 34.70% and R$ 37.26.
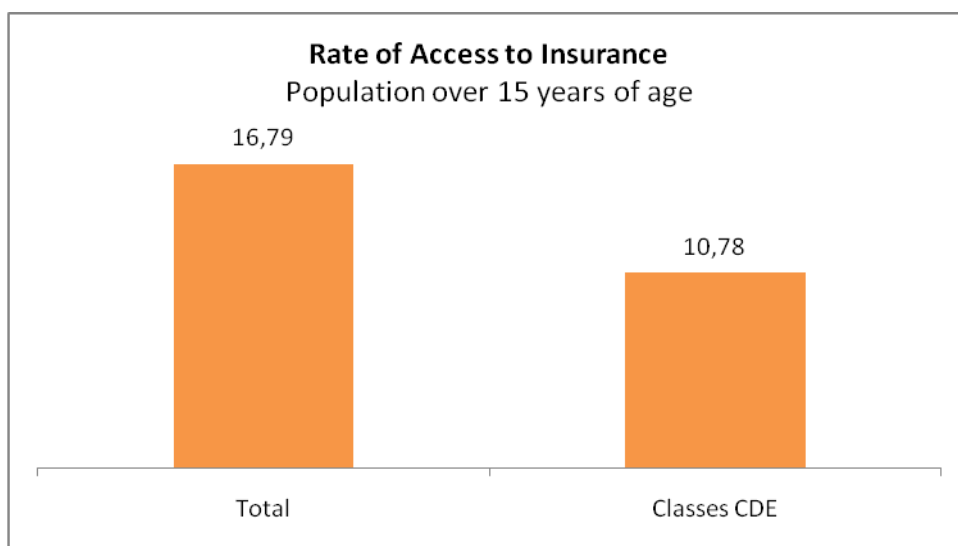
Marginal Rate of Access to Insurance per Groups of Income

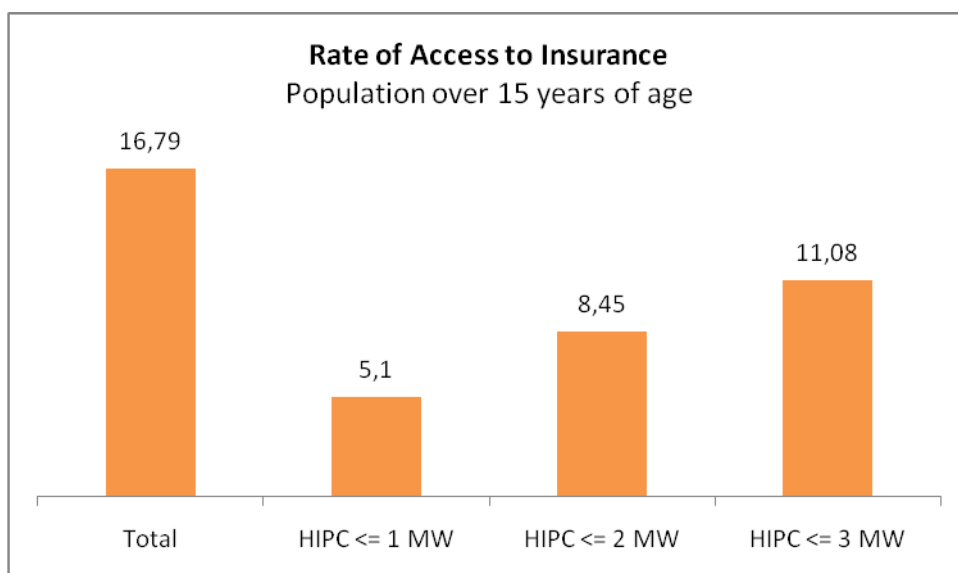| Classes	RFPC	TOTAL INSURANCE	HEALTH	CAR	LIFE	PENSION	OTHER
E	130,95	1,93	0,96	0,24	0,36	0,01	0,50
D e E	277,13	8,55	2,05	0,07	0,75	0,09	0,63
C, D e E	1172,45	34,70	8,10	0,73	2,58	0,16	1,20
Total	8297,63	62,94	51,42	23,92	20,86	4,14	2,12

Source: CPS/FGV from the POF/IBGE's microdata

Combined class CDE, which is central to this study, presents an access rate of 10.78% and an average monthly expense of R$ 8.56 per person. I would like to emphasize its proximity to the statistics of the income level per capita of up to 3 minimum wages with an access rate of 11.08% and average monthly expenses of R$ 8.89 per person. The proximity in population size of the two criteria respectively explains the proximity of access rates.

The other point to be emphasized is that despite the fact that the class CDE includes almost 85% of the population, there is a significant difference in the access rate compared to the total population: 55.75% (16.79% versus 10.78%) and average expenditure per person of 169.5% (R$ 23,96 versus R$ 8.89). In the case of average expenses, differentials in access are added to the differential in expenses of those who have positive insurance expenditure. This reflects the fact that the class AB has a level of demand far greater than other classes with access rate of 3 and average cost of R$ 99.29.

Rate of Access to Insurance
Population over 15 years of age

16,79 — Total
10,78 — Classes CDE

Source: CPS/FGV from the POF/IBGE's microdata

Rate of Access to Insurance
Population over 15 years of age

16,79 — Total
5,1 — HIPC <= 1 MW
8,45 — HIPC <= 2 MW
11,08 — HIPC <= 3 MW

Source: CPS/FGV from the POF/IBGE's microdata

Panorama of Access to Microinsurance

The panorama constructed from the POF (Household Expenditure Survey) is an interactive database that allows the assessment of the access to and average expenditure on different insurance items from the simple crossing of the variables. *Link*

http://www.fgv.br/ibrecps/miseg/despesas/index2.htm

What follows is an analysis of the portfolio of individual insurances by different economic classes. In the case of health plans, the most widespread of all, rates range from 0.76% for Class E to 36.65 in Class AB. Then, there is car insurance (ranging from 0.05% to 13.84%) and life insurance (0.29% to 12.88%). Private pension funds and other types of insurance are even less present, even considering individuals with the highest income (access rates are respectively 1.91% and 2.43% for Class AB). The table below shows the distribution of people with access to insurance per income categories.

% of the Population with Insurance expenses per Economic Class Brazil – Individuals over 15 years of age								
Class	Insurance	Health Plan/Insurance	Car Insurance	Life Insurance	Open or Close Private Pension Funds	Other	Expenses with Health	Expenses with Health (without a plan)
Class E	1,45	0,76	0,05	0,29	0,01	0,44	5,92	0,053
Class D	4,19	2,64	0,09	1,01	0,13	0,74	11,87	0,0992
Class C	15,69	12,07	1,15	3,74	0,2	1,56	26,49	0,1785
Class AB	46,17	36,65	13,84	12,88	1,91	2,43	52,72	0,3015

5 . What are the main determinant factors in the demand for Microinsurance?

We started by exploring the abundance of information from POF having as a basis a selection model of variables according to the level of statistical significance related to the demand for insurance. Subsequently, we delineated a more parsimonious model from available variables in other databases such as the PNAD, which allow simulating the demand for insurance. The first exercise works as part of the learning process to reach a model applied to various types of insurance. In order to determine which ones have more explanatory power and which would be more relevant, a sequential procedure of variables choice using a binomial logistic model was used.

The list of variables selected for each model (from an F-test) is presented below in a self-explanatory list of 11 variables in order of importance. Excluded variables[2] were not displayed on the table:

STEPWISE Model for selection of variables		
Insurance Expenses		
ORDER OF ENTRY IN THE MODEL		
	Insurance	Microinsurance
Economic Class	1	3
Credit Card	2	1
Contributes to Social Security	3	2
Position in the Household	4	5
Years of education	5	6
State	6	7
Age Group	7	9
Car financing	8	10
Employment status	9	8
Car ownership	10	4
Area – Size of city	11	11
School attendance	-	12
Source: CPS/FGV from the POF/IBGE's microdata		

First of all, it is worth pointing out the relative importance of economic variables, which seems to be greater than the socio-demographic and spatial variables when explaining the demand for insurance and microinsurance as well (note: we will present microinsurance data in parentheses to facilitate the comparison variable by variable). It is also worth noting that the *income class* variable was the first to enter the insurance model (and 3rd to enter the microinsurance, when the truncation of the sample was used with the removal of class AB), before *full years of education*, in 5th place (falling to 6th in microinsurance), which typically has the highest explanatory power in empirical research on income inequality.

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[2] Gender, color / race; installment payment delays for goods / services, religion, income difficulties, problems with violence, with expenses in real estate (cash or in installments); capital cities

It is worth noting that we are not talking about the magnitude of the coefficient for each category, but the explanatory power of the set of categories to explain the use of insurance (and microinsurance). When we look at the magnitude of the extreme categories for each variable, keeping other characteristics constant, the chances of a person in class AB using insurance is 690% greater than one person in class E, while a person with a university degree is 248 % more likely to have access to insurance than a person of up to three years of formal education, i.e., a functional illiterate (in the case of microinsurance this difference is 173%). The *possession of a credit card* is presented as the second most relevant variable to explain the use of private insurance in general (and first in microinsurance). Those who have no credit card have a 61.3% lower chance of having insurance than someone who has it (in the case of microinsurance the respective difference is 62.3% lower). The indicative variable concerning contribution to official pension funds is the third to enter the insurance model (and 2nd in the microinsurance) and it indicates that those who have contributed have a 50.5% greater chance than someone who has not contributed (in the case of microinsurance this difference is 53.4%). A major difference between the two models of demand for insurance and microinsurance is the importance of the variable *car-ownership*, which is the 10th in the case of insurance and 4th in the case of microinsurance. This indicates that having access to car ownership has a high proportion of influence in the purchase of insurance on the income distribution basis.

Following the order of statistical significance of the insurance model, we have two socio-demographic variables. In fourth place, the variable *position in the family* (5th in the case of microinsurance). The coefficient of the variable *spouse* is 40.6% higher in the case of insurance than the head of the household (33.7% for microinsurance) and similar differences in comparison with other types of members at home as children, other relatives etc. (but somewhat larger differences in the case of microinsurance). The fifth variable already mentioned was the one regarding completed *years of study*, followed by *State*, where the state of São Paulo presents higher access rates to insurance than other 26 states. This indicates that São Paulo is not more sophisticated just because of the distribution of socio-demographic and economic attributes (the same occurs in microinsurance, indicating that São Paulo has a greater degree of financial sophistication controlled at the base of the pyramid).

The *age distribution* appears as a seventh variable in terms of explanatory power. We found a marked monotonic upward trend indicating an increase in the chances of access to private insurance in the range from 15 - 20 to 50 - 59 years of age, when generally speaking,

the access rate stabilizes itself at the top end (the same standard of cycle life is found in the case of microinsurance).

It should be noticed the importance of indicative variables of *car ownership* (10th in the demand for insurance as stated above and 4th in the case of microinsurance) and *car financing* (8th in the case of insurance and 10th in the case of microinsurance) and *employment status* (9th in the demand for insurance and 8th in the case of microinsurance), followed by *size of city* (11th in the demand for insurance and microinsurance). As important as the presence, is the absence of joint statistical significance of other variables, such as the perception by the interviewed person of violence in his neighborhood of residence, the perception of insufficient income and other variables, such as *default payments for the purchase of goods*, *recent purchase of property in cash or in installments* or socio-demographic variables related to gender (relative to the position in the family), race and religion. In short, selecting variables in both market segments reveals the importance of education and the role in the family, but it leaves no room for other variables of demographic targeting while making room for spatial targeting. Selected economic variables play a key role in the demand for insurance, especially in relation to the economic class under analysis. This is of fundamental importance not only for the case of microinsurance, but for the aggregate demand for insurance taking into account the inflection in the composition of income groups observed in Brazil in recent years. We will return to this point later, when we will establish estimates of the current insurance market, also including the period after the beginning of the crisis in September 2008.

What are the determinant factors in the Demand for Microinsurance by sector?

What follows is an analysis of the main determinant factors of the portfolio of individual insurances by different economic classes. Continuing with the previous results, the most important variable in all types of insurance, when looked in isolation, is *economic class*. However, when we evaluate the same variable in the microinsurance model, it occupies the lower positions, such as health insurance (3rd position), car (10th), life (4th) and pension (excluded from the model). Following this line of interpretation, other economic variables lead the ranking of importance in the estimated model. Having a *credit card* should be highlighted, as it is part of all estimated models. In models of health insurance, life insurance and retirement plans, it is the main variable, apart from income, both in the case of insurance and microinsurance. *The car* variable, both concerning ownership and as expenses, has a

relevant role in car insurance. We shall exemplify the above with the health insurance type, which is the most popular one.

STEPWISE Model for selection of variables		
Health Insurance Expenses		
ORDER OF ENTRY IN THE MODEL		
	Insurance	**Microinsurance**
Economic Class	1	3
Possession of Credit Card	2	1
Contributes to Social Security	3	2
Years of study	4	4
Age Group	5	5
State	6	6
Position in the Family	7	10
Employment status	8	7
Area – Size of city	9	8
Car ownership	10	9
Car F=financing	11	11
Gender	12	-
Source: CPS/FGV from the POF/IBGE's microdata		

Household Income Per Capita vs. Individual Income: Family is what Matters

We made other exercises of selection with a greater number of socio-economic variables[3]. In the category income, we included, in addition to economy class, the household per capita income and the individual income of each family member to make a "horse race" among these variables to verify which one would have more explanatory power. Just as with the models already discussed, despite having included continuous approximations of individual and per capita income in all models of insurance demand *latu sensu,* the economic class based on household per capita income appears as the most important variable. As we can see in the table, per capita household income is an important tool in determining access to insurance, and even more important in the case of microinsurance, where it occupies the top positions. On the other hand, individual income does not remain within any estimated models after variables exclusion. In short, the demand for various types of insurance and microinsurance are highly related to income. The income that matters for private insurance demand is the household income and not the individual one.

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[3] Gender, color / race, position in the family, age group, years of education, economic class, region - area of home, delay in the provision of goods / services; state, religion, income difficulties, school attendance, problems with violence, credit card ownership; pension funds participant, status in employment, car ownership, car expenses, expenses in cash with real estate, expenses in installments with real estate, capital, per capita household income and individual income.

Real Estate Insurance: Controlled Access

We replicated the same previous exercises for real estate insurance. We treat this expense separately from others because it is a collective household expense. In order to make them more compatible with other insurances in terms of analysis, we calculate this information in per capita levels, i.e. we proportionally divide the expenses declared in the questionnaire by the number of family members. The results presented are not very different to the other items of insurance when controlled for economic variables. In what concerns the socio-demographic variables, we did not find any major statistical significance (it is worth remembering the family characteristic of this type of insurance), while some particularities are found in the spatial variables.

Inequality of Expenses on Insurance

In the light of the results discussed above, we made an estimate for the inequality of insurance expenses for the population with expenses and for the population as a whole. When we analyzed the total population, which would be the most relevant because it combines both inequality in the access rate and intensity of use, we observed a Gini coefficient close to the unit value, the upper limit of perfect inequality. The Gini index increases from the expenses with health insurance to other insurances, such as car and life insurances, in this order reaching its peak with expenses on private pensions - which are the highest, at 0.9985. The last collum correspond to the income elasticity of different insurance types calculated directly by the ratio of Ginis. Accordingly, the highest income elasticity is for the demand for private pension of 1,73.

EXPENSES with INSURANCE			
Total Population			
AVERAGE	GINI		Income Elasticity
Income Per Capita	832,85	0,5768	-
Total Expenses	23,96	0,9349	1,6207
Health Insurance	16,80	0,9448	1,6379
Car Insurance	3,22	0,9812	1,7010
Life Insurance	2,17	0,9860	1,7094
Private Pension Fund	1,03	0,9985	1,7311
Source: CPS/FGV from the POF/IBGE's microdata			

Expense Equations of Insurance and Microinsurance

The first part of the multivariate analysis was related to possible determinant factors of access to insurance for the low-income population, now we are doing an analogous analysis applied to the determinant factors of increased spending on insurance. Beforehand, the access variable was discrete, like *had or did not have* insurance expenses. The analysis on the proportion of expenses has a continuous nature, complementing the previous one, deepening the determinant factors for demand among those who had access and had used these financial instruments. That is, the sample studied here is restricted to those who had positive expenses. We have replicated the same previous selection procedure of sequenced variables having as a starting point the level of statistical significance in models that estimate the expense log. The list of selected variables for each model is provided below in order of importance through a self-explanatory list of 10 variables. Eliminated variables were not displayed on the table:

STEPWISE Model for selection of variables		
Expense Equations of Insurance		
ORDER OF ENTRY IN THE MODEL		
	Insurance	**Microinsurance**
Economic Class	1	5
Groups of Age	2	2
Years of Study	3	1
Car ownership	4	3
Possession of Credit Card	5	4
Employment status	6	-
Area – Size of City	7	6
Car Financing	8	-
Position in the Family	9	-
State	10	-
Pension Fund Participant	-	7
Source: CPS/FGV from the POF/IBGE's microdata		

There is a similarity between the results of the equations of access to insurance and the equations of insurance expenses. For example, the class of income continues to be the first variable to enter the insurance expense model (and 5th to enter the microinsurance, when we truncate the sample removing the class AB). Controlled results for those who have expenses show that in class AB it is 97% higher than in class E. Some economic variables dropped from position in comparison to the previous year, while others such as age and education gained prominence. The second place among the selected variables in the total (as in Class CDE) is now for a demographic variable: age group, which becomes more relevant in the determination of expenses. In this category, the expense variable increases throughout

the life cycle. The differences do not stop there: an important variable in determining the demand, the pension fund contribution, did not enter the model of expenses on insurance (and was in 7th place, i.e., the last when it comes to explain expenses in microinsurance). Following, in 3rd place (1st) we have years of study as an important predictor of expenses on insurance (microinsurance). Growing monotonically, as we move from functional illiteracy to higher levels of study, it gets to be 76% higher when the person has 12 or more years of study.

Continuing the analysis for the selection of variables in the equation of expense for different types of insurance, we noticed that the economic class was the only one that entered all models (which did not occur in the case of microinsurance). First place in all the equations, it is again the most important variable.

6. Substitution and Complementarities between Different Types of Microinsurance

What follows is an analysis of the determinant factors of the demand for insurance by exploring the interaction between different types of insurance. We prefer to perform this analysis separately, because we believe it is only an indicator of the relationship between the uses of different financial instruments.

Access Matrixes to Different Types of Insurance

Listed below are the access matrixes to different types of insurance. Data is presented in a 5 x 5 matrix form, where the results of the diagonal show the total for each type of insurance. We can analyze how the combined access to different types of insurance is by focusing on a specific row or column. For example, analyzing the first line with the first column of the two matrixes below, we find that 12.94% (8.09%) of the population have health insurance (microinsurance). Keeping the line and looking at the other columns, we conclude that 1.81% (0.40%) have health and vehicle insurance (microinsurance) at the same time; 2.22% (0.99%) health and life insurance; 0.29% (0.07%) health and pension funds, and finally 0.48% (0.31%) health and other insurance not specified here. Next, by looking at the second line, we evaluate how the access to car insurance interacts with the other types. The results are: 0.79% (0.11%) has life and car insurance, 0.13% (0.025) has car insurance or other type of insurance.

Access Matrix to Insurance					
	HEALTH	**CAR**	**LIFE**	**PENSION FUND**	**OTHER**
HEALTH	**12.94**	1.81	2.22	0.29	0.48
CAR	1.81	**2.95**	0.79	0.13	0.13
LIFE	2.22	0.79	**4.31**	0.16	0.35
PENSION FUND	0.29	0.13	0.16	**0.45**	0.02
OTHER	0.48	0.13	0.35	0.02	**1.41**

Source: CPS/FGV from the POF/IBGE's microdata

Access Matrix to MicroInsurance					
Class CDE					
	HEALTH	**CAR**	**LIFE**	**PENSION FUND**	**OTHER**
HEALTH	**8.09**	0.40	0.99	0.07	0.31
CAR	0.40	**0.73**	0.11	0.02	0.02
LIFE	0.99	0.11	**2.56**	0.03	0.22
PENSION FUND	0.07	0.02	0.03	**0.16**	0.01
OTHER	0.31	0.02	0.22	0.01	**1.20**

Source: CPS/FGV from the POF/IBGE's microdata

Next, we make similar exercises but in a multivariate way, i.e., we control the access to different types of insurance. The difference of this present analysis is the fact that we control the access to insurance not only through other types of insurance (as before), but also through socio-demographic and economic characteristics of individuals. The advantage of this type of exercise is that you isolate effects such as income, education, among others, that is, we analyze, for example, the access to health insurance due to their lack of access to other insurances, comparing people with the same observable attributes. As presented in the previous statistics, the chances of controlled access to this type of insurance are higher when the individual has already some other insurance. For instance, they are up to 2.6 times higher in health insurance for those who have life insurance. The same result is found in the access to microinsurance, but in higher intensity: the chances are at least 3 times higher in three of the four items analyzed here.

8. Breakdown of the Demand for Microinsurance

In the traditional bivariate analysis, as illustrated in this section, we take the gross correlations of the insurance with each economic or socio-demographic variable taken in isolation. It quantifies the size of each market segment of the insurance and microinsurance without considering the existent interaction between the variables. For example, the fact that

higher income and education are positively correlated with each other and also possibly associated with a greater demand for insurance prevents us from establishing exactly what is driving the demand for a specific type of insurance, income, education or both. That is why it is important to use multivariate models, where this interdependence between the variables is taken into account as in the previous section.

We explore two ways to consider the interdependence of variables. In the first one, we adopted a statistical procedure, where an initial set of variables entering the model is selected for its respective explanatory power. This allows us to explore a wider range of determinant factors of demand for insurance from the wealth of information provided by the POF, without imposing restrictions on the selection a priori. Data informs us what is or is not relevant in terms of explanatory power. A second strategy more related to the economic perspective is to impose a priori the variables used in the estimated model, possibly with some variables not significant. In this case, we selected the POF variables in order to allow us to work with the PNAD at the same time. The advantage of this procedure is to generate a uniform model for every type of insurance, and to direct the selection of variables to what is available in other micro-databases, as illustrated below:
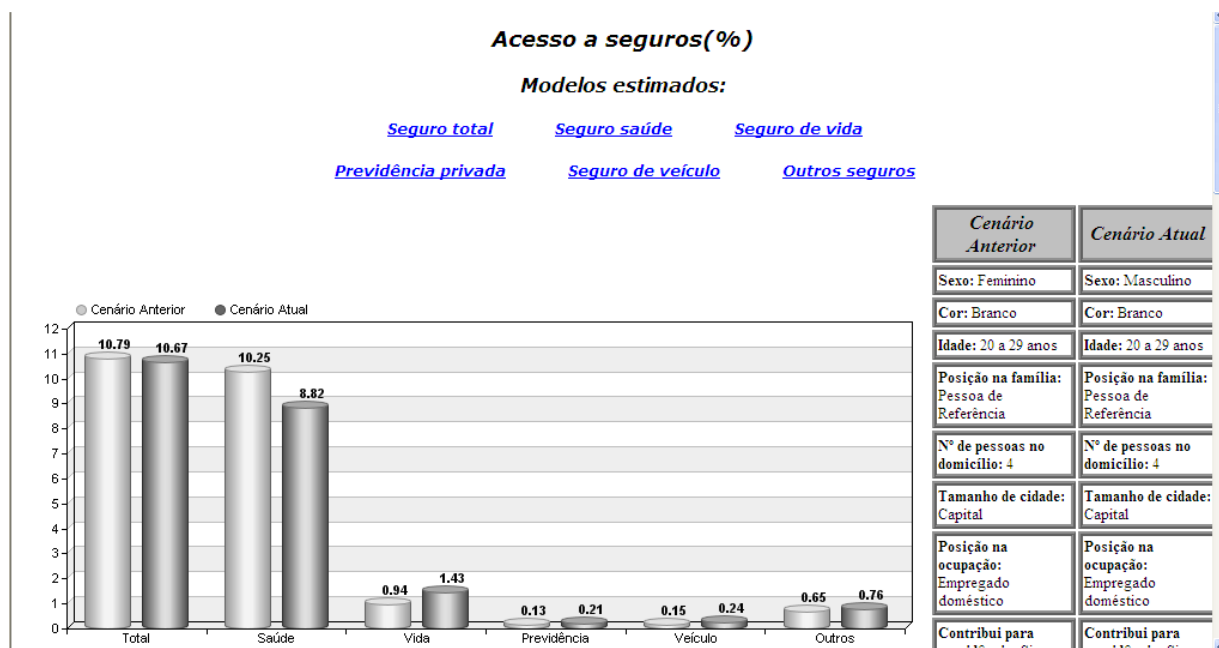
Access and Expenses Simulator

It is the tool used to simulate the probabilities of access and average individual expenses on different types of insurances, through the combination of their attributes. Select their features in the form below and click on Simulate.

The graphs presented show, in order:

a. Probabilities of having expenses on each item (using as a basis for calculating the portion of the population that answered the questionnaires of individual expenses)

b. the average value spent

Example

Access to Insurance (%)

One of the bars represents the scenario now, with the result according to selected characteristics; and the other bar, the previous scenario that shows the previous simulation. All the models being used can be found in the research website. Throughout the text we presented the findings of the multivariate exercises: *link* *http://www.fgv.br/ibrecps/miseg/POF_sim/index.htm*

a) Economic Variables

Economic Classes

As we discussed earlier with the multivariate models for the selection of variables to explain the access to insurance, income or its counterpart in terms of economic class is the major determinant of the access to insurance, health insurance and retirement plans. In class E, access to insurance in general is 1.45%, and 52% of its policyholders have a plan / health insurance. In class D, its policyholders are 4.19% of the population and the proportion of plan / health insurance in relation to insurance is 63%. In class C, these figures are 15.69% (access) and 77% (composition health / insurances). The class AB presents the highest rates of both access to insurance in general (46.17%) and the proportion of policyholders with a plan / health insurance (80%).

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When we use the basic multivariate model, an individual in class AB with other similar characteristics has 16.9 times more chances to have insurance compared to class E. Among the analyzed insurances, we emphasize once again the access to car insurance, the probabilities of which are 165 times more, followed by pension fund, 34 times more.

Causality, Family Altruism and Health Insurance

We use multivariate exercises with difference in difference estimators to study the impact of income on the demand for health insurance by the Brazilian elderly population. The focus here is the use the increased income transfers to low-income elderly people as a laboratory to identify the effects of income on health, separating the effects going in the opposite direction (who has access to better services would be more productive and could generate more income). The database was the health supplements of PNAD 1998 and 2003 that occurred during the expansion of programs like Continuous Cash Benefit (BPC) and the rural non-contributory pension fund. Again, results reveal that older people eligible to income transfer programs have a distinct improvement in their access to health services in the five year study, which is consistent with the idea that more income generates greater access to health insurance. The chance to gain access to health insurance between 1998 and 2003 was 37.8% higher in the beneficiary group of income transfers compared to the control group of the others. Secondly, corroborating the existence of some family altruism, but lower than the first treatment group, there was a 27.4% of gain in the chance of access to health insurance among the non-elderly, living with someone elderly eligible for income transfer programs.

Contribution for Public Pension Fund (Social Security)

All studied insurances have direct relationship with the social security contribution. In other words, the social security contribution is a variable that indicates the occurrence of complementarities, not substitution effects between social insurances and social security. The access rate to different types of insurances (and microinsurance) is about three times higher among contributors than among other workers. In the controlled analysis for access to insurance (microinsurance) contributors have 2.2 (2.3) times higher chances than other workers.

Employment Status

The highest access rate to insurance occurs for employers (43.57%) and public employees (39.99%) in the total population. In class CDE, the access peak occurs with public

employees (28.15%) and employers (25.21%). Self-employed workers have an access rate lower than the average of the general population, 13.22% in the category against 16.79% in all other categories. In the multivariate model, controlling through other considered characteristics, the fact that the person is an employer increases his/her chances of access to all items of insurance (microinsurance).

Income Risk

PME uses a rotating panel methodology that seeks to gather information from the same households over the months. The approach used here consists of calculating the probabilities of transition into and out of the four economic groups, as well as of non-transition among these groups, observing the same people twice with twelve months in between starting in March 2002. The appearance of longitudinal data from household per capita income in this work will provide the basic empirical evidence for the pattern of social mobility observed in practice.

We opened the transitions (destinations) of each economic level per year. We presented the information year by year until the month of June, which could be one way to measure possible impacts of the crisis in the transition between classes. The data shows that years 2004 and 2008 stand out in the statistics, with only 59.5% and 59.91% of the Class E remaining in Class E, a year after the first observation (collected in 2003 and 2007, respectively). If we look at what happened in the early months of 2009, compared to the same period a year earlier, there was an increase of 1 percentage point in the number of people remaining in Class E (60.83%). When we analyze the opposite extreme, those that remain located in the Class AB begin to show negative growth in 2008 and 2009. If we analyze the last period, the result was worse (74.63% remain AB between 2008 and 2009 - measured until June). It had been growing very strong, and began to lose strength.

b) Socio-Demographic Variables (omitted)

c) Spatial Variables

Urban Diseconomies

Problems with violence in the region are associated with an increased demand for insurance in all forms taken by the POF, being always higher the access rate to insurance in the total population compared to the classes CDE. For individuals who reported problems

with violence in their neighborhood, the access rate to insurance is 18.53% (11.55%) in total population (Class CDE) against 16% for insurances (and 10.45% for microinsurance) to those who did not report problems with violence. This effect tends to disappear in the multivariate model, which can be the result of opposing forces to the increased demand for insurance – as perceived violence is not solved by the provision of insurance for the same reasons.

Size of the City

Both in the case of insurance as in the case of microinsurance in general, there is a higher access rate to insurance in the capitals than in other city sizes. The exceptions are in the case of life insurance and car microinsurance, where we found a higher access rate in cities outside the metropolitan axis. The lowest access rates are found in rural areas followed the outskirts of cities.

Region proves to be an important variable in a controlled determination of access to insurance. In general, the chances increase as we move from rural areas towards the capital. The ratio is even greater when we analyze health insurance and pension plans, with chances two times higher in the capital.

Capitals

In the ranking of capitals for access to security and private pension funds services is Brasilia, with 46% of the insured population, a higher rate than that of the population of employers (43%), for example. Following, we have Vitória (36%) and São Paulo (30.4%). Finally, last in the ranking appears Boa Vista (5.5%), with a access rate to insurance rather higher than the population that never attended daycare or school (4.1%).

In view of microinsurance, that is, covering only the population of classes CDE, São Paulo has the highest rate, with the same level as Belo Horizonte, 18.2%, slightly less than the general population's access to high school (19.73%). Boa Vista (3.2%) also ranks among the worst place among capitals, with an access rate lower than the national average of class D (4.19%).

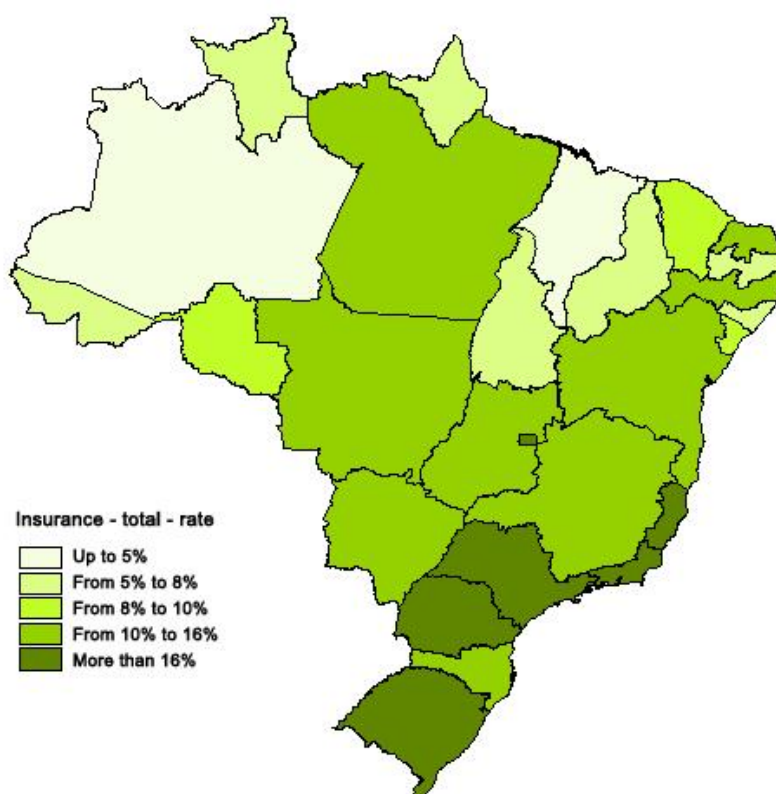| Ranking of access to insurance services - Capitals					
Total Population		%	Classes CDE		%
Insurance			Microinsurance		
1	Brasília – DC	46,8	1	São Paulo - SP	18,2
2	Vitória - ES	36,3	2	Belo Horizonte - MG	18,2
3	São Paulo - SP	30,4	3	Belém - PA	17,3
4	Belo Horizonte - MG	26,8	4	Vitória - ES	17,1
5	Curitiba – PR	26,2	5	Cuiabá - MT	16,8
6	Porto Alegre - RS	25,1	6	Campo Grande - MS	16,4
7	Rio de Janeiro - RJ	24,8	7	Brasília – DC	15,3
8	Campo Grande – MS	24	8	Salvador - BA	15,1
9	Belém - PA	22,6	9	Curitiba – PR	14,7
10	Salvador - BA	22,5	10	Recife - PE	12,9
11	Cuiabá - MT	21,8	11	Natal - RN	12,9
12	Natal - RN	20,7	12	Goiânia – GO	12,4
13	Recife - PE	20	13	Fortaleza - CE	11,8
14	Goiânia - GO	19	14	Porto Alegre - RS	11,3
15	Fortaleza - CE	16,8	15	João Pessoa - PB	10,2
16	João Pessoa - PB	16,3	16	Teresina – PI	10,2
17	Maceió - AL	16,1	17	Maceió - AL	10
18	Florianópolis - SC	15,3	18	Porto Velho - RO	9,35
19	Teresina - PI	14,6	19	Rio de Janeiro - RJ	9,14
20	Porto Velho - RO	12,7	20	Aracaju – SE	8,92
21	Aracaju - SE	12,1	21	São Luís - MA	7,61
22	São Luís - MA	11,3	22	Rio Branco - AC	7,43
23	Rio Branco - AC	10,8	23	Florianópolis - SC	7,38
24	Macapá - AP	7,5	24	Palmas - TO	5,97
25	Palmas - TO	7,12	25	Macapá - AP	5,55
26	Manaus - AM	6,35	26	Manaus - AM	4,99
27	Boa Vista - RR	5,5	27	Boa Vista - RR	3,2

Source: CPS/FGV from the POF/IBGE's microdata

Federal State

Below, we present a map of the access rate to insurance and microinsurance per federal state, using equivalent scales of color to facilitate comparison. In it, the states of

South and Southeast stand out. In the first map of insurance, the negative exception is Santa Catarina. In the second map of microinsurance, the positive prominence state is Sao Paulo and the negative one is Rio de Janeiro.
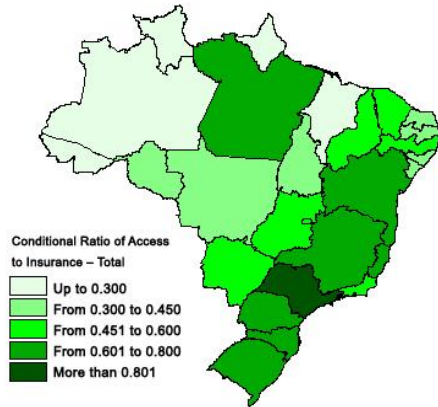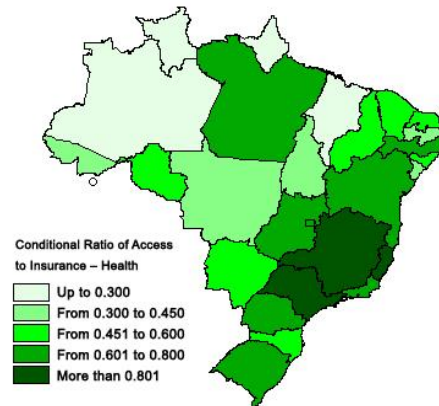
Insurance – Total – Rate

In the controlled analysis, as we observe, the state of São Paulo presents all items with a greater chance of access. We also set a map of pent-up demand for insurance (microinsurance). In other words: when comparing people with exactly the same observable attributes in Sao Paulo and Roraima, the first is 6 (7) times more likely to have access to insurance than the state of Roraima. Because they have the same characteristics, the person who lives in Roraima can be considered a potential case of access. In this case, the geographic isolation can be a hindrance. On the other hand, the comparison between Sao Paulo and Brasilia indicates that the republic's capital has 55% less chance of access to insurance and 58% lower in the case of microinsurance. Drawing the map on the same scale as other types of insurance, for visual identification of the most promising markets, namely those with high potential demand for insurance, due to the effect, for instance, of high-income or education and low access, they are identified with the lighter colors.
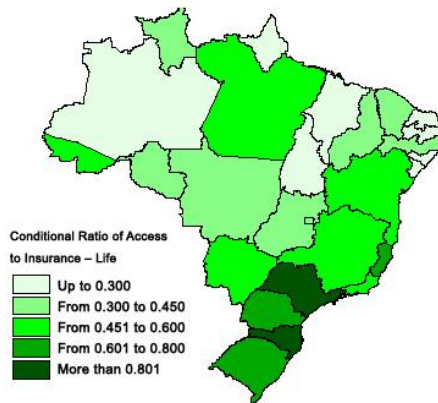
29

Odds Ratio of Access to Insurance

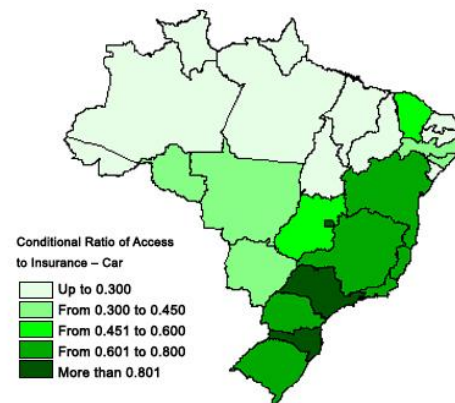Conditional Ratio of Access to Insurance – Total
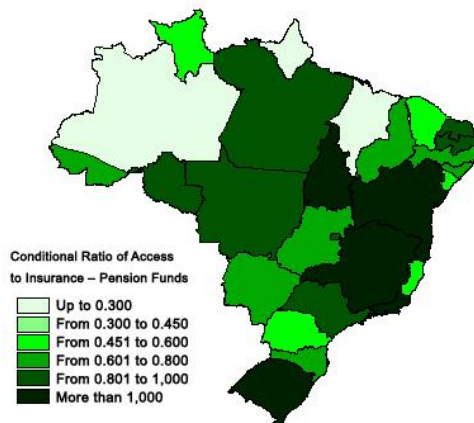
Conditional Ratio of Access to Insurance – Health

Conditional Ratio of Access to Insurance – Total
- Up to 0.300
- From 0.300 to 0.450
- From 0.451 to 0.600
- From 0.601 to 0.800
- More than 0.801

Conditional Ratio of Access to Insurance – Health
- Up to 0.300
- From 0.300 to 0.450
- From 0.451 to 0.600
- From 0.601 to 0.800
- More than 0.801

Conditional Ratio of Access to Insurance – Life

Conditional Ratio of Access to Insurance – Car
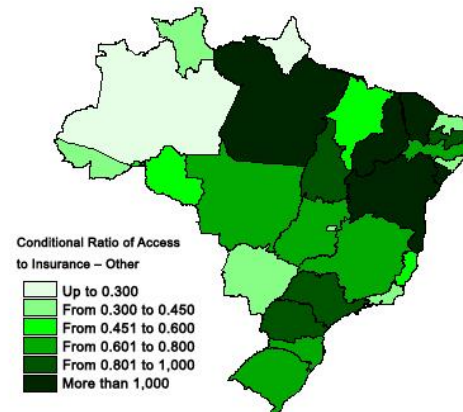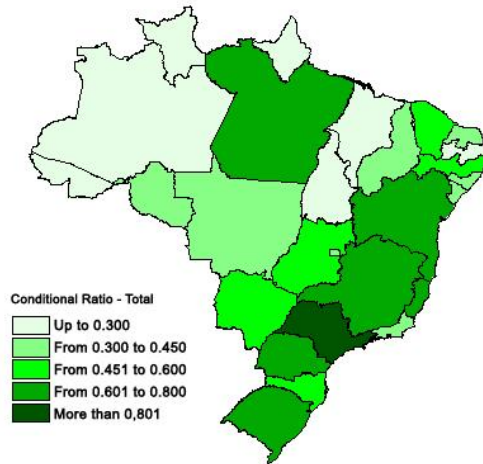

Conditional Ratio of Access to Insurance – Life
- Up to 0.300
- From 0.300 to 0.450
- From 0.451 to 0.600
- From 0.601 to 0.800
- More than 0.801

Conditional Ratio of Access to Insurance – Car
- Up to 0.300
- From 0.300 to 0.450
- From 0.451 to 0.600
- From 0.601 to 0.800
- More than 0.801

Conditional Ratio of Access to Insurance – Pension Funds

Conditional Ratio of Access to Insurance-Other

Conditional Ratio of Access to Insurance – Pension Funds
- Up to 0.300
- From 0.300 to 0.450
- From 0.451 to 0.600
- From 0.601 to 0.800
- From 0.801 to 1,000
- More than 1,000

Conditional Ratio of Access to Insurance – Other
- Up to 0.300
- From 0.300 to 0.450
- From 0.451 to 0.600
- From 0.601 to 0.800
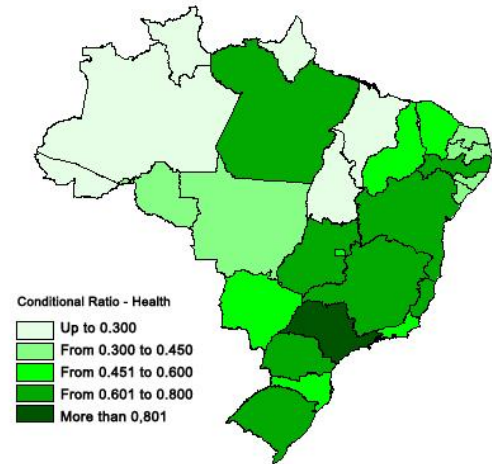- From 0.801 to 1,000
- More than 1,000

Source: CPS/FGV from the POF/IBGE's microdata
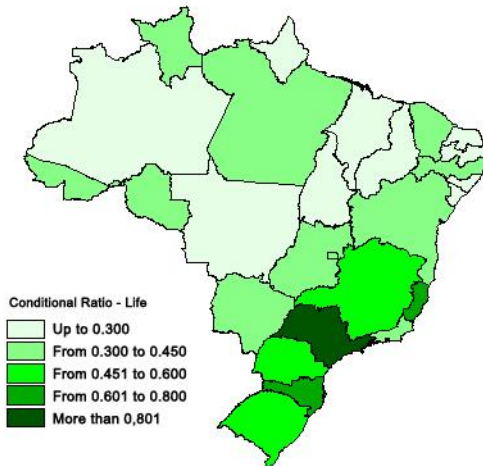
30

Odds Ratio of Access to Microinsurance

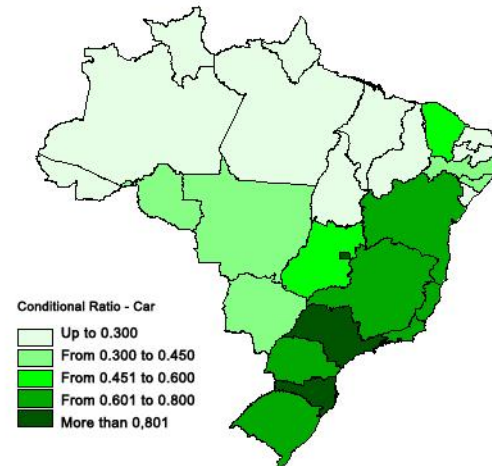Conditional Ratio of Access to Microinsurance
(Classes CDE) – Total

Conditional Ratio of Access to Insurance
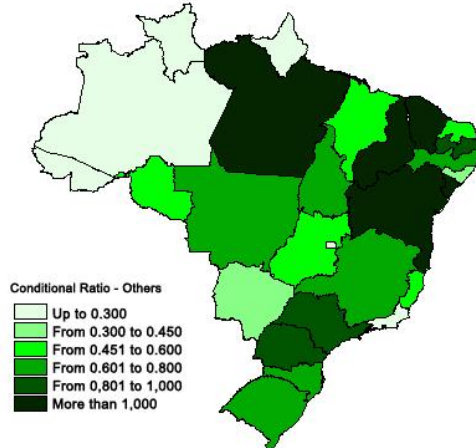(Classes CFE) – Health

Conditional Ratio - Total
- Up to 0.300
- From 0.300 to 0.450
- From 0.451 to 0.600
- From 0.601 to 0.800
- More than 0,801

Conditional Ratio - Health
- Up to 0.300
- From 0.300 to 0.450
- From 0.451 to 0.600
- From 0.601 to 0.800
- More than 0,801

Conditional Ratio of Access to Insurance
(Classes CDE) – Life

Conditional Ratio of Access to Insurance
(Classes CFE) – Car

Conditional Ratio - Life
- Up to 0.300
- From 0.300 to 0.450
- From 0.451 to 0.600
- From 0.601 to 0.800
- More than 0,801

Conditional Ratio - Car
- Up to 0.300
- From 0.300 to 0.450
- From 0.451 to 0.600
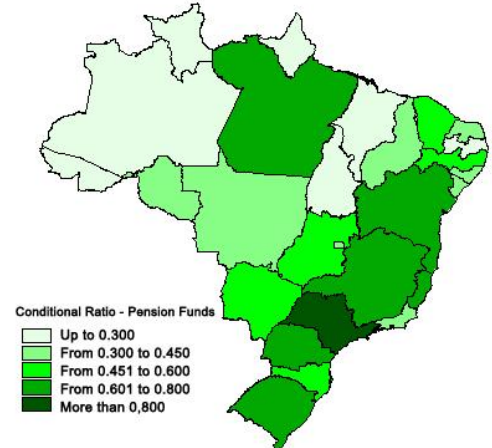- From 0.601 to 0.800
- More than 0,801

Conditional Ratio of Access to Insurance
(Classes CDE) – Other

Conditional Ratio of Access to Insurance
(Classes CFE) – Pension Fund

Conditional Ratio - Others
- Up to 0.300
- From 0.300 to 0.450
- From 0.451 to 0.600
- From 0.601 to 0.800
- From 0,801 to 1,000
- More than 1,000

Conditional Ratio - Pension Funds
- Up to 0.300
- From 0.300 to 0.450
- From 0.451 to 0.600
- From 0.601 to 0.800
- More than 0,800

Source: CPS/FGV from the POF/IBGE's microdata

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9. Conclusion

Insuring against uncertainties is present in the many dimensions of people's lives, such as those related to accidents, robbery, fire, diseases, disabilities, unemployment, and death, among others. We speak of insurance bought in the private market and not social insurance, including protection mechanisms offered by the State and relationship networks in society, which we frequently approach in our studies. Micro-insurance, private that is, improves low-income people's ability to deal with the frequent fluctuations in their incomes, among other risks. The probability of becoming poor between these two consecutive months is 8.3%. When the consumption level of the household is low, the consequences of adverse shocks are worse than the gains from positive innovations. Insurance should not be a luxury service! Poor people ideally could brace themselves for adverse shocks by demanding insurance in the market, self-insurance through savings, or by being covered by public insurance. The problem with placing all eggs into one single public basket is that the State, contrary to George Orwell's Big Brother, does not have eyes everywhere, and as such, it cannot react to the specific situation or preferences of each person. As the saying goes "the devil is in the detail". Private micro-insurance holds the promise of offering protection when this seems more necessary to whom it may interest.

The social role and the demand for micro-insurance depend on the dynamics of the individual income process, of the social insurance provision and it thus requires an assessment of the complementary institutions that may cushion adverse shocks. Brazil displays a developed financial system, but little focused on low-income markets, in particular, in the insurance area. On the other hand, there is an abundant offer of social insurance on the part of the Brazilian State in comparison with other countries with similar income levels. This forces the private micro-insurance industry to be well-tuned both with its public sector competitors, as well as with the new business opportunities from people ascending to higher social classes in need of protection to keep their recently acquired living standards. Insurance supply can still use the data records and the frequency of new social programs to reach the bottom level of income where it has never been before. This juxtaposition of effects and changes in opposite directions demands an empirical work to guide companies who aim to explore the Brazilian micro-insurance market. This project is part of a larger research effort under the auspices of Funenseg in an attempt to create a micro-insurance infant industry in Brazil.

The average rate of access to insurance in the population is 16,79%. That is, the population who has at least one type of private insurance as pointed out in the research

questionnaire. We estimated the inequality in insurance-related expenses – whose Gini index is 0,935 close to the unit value – to be the upper limit of the perfect inequity, that is, when only one person has all the insurance in society.

Our focus here is the so-called micro-insurance defined not by the value of insurance policies, but by the income of its potential client base that here we define as Classes CDE. Class CDE, which is central to this study, presents an access rate of 10,78% and an average monthly expense of R$ 8,56 per person.

We explore the wealth of microdata from the Household Budget Surveys (POF/IBGE) based on a model of selection of variables according to a level of statistical significance related to the demand for insurance, applying a procedure of a sequential choice of variables. It is worth noting the relative importance of economic variables vis-à-vis socio-demographic and spatial variables in explaining the demand for insurance. The income class variable was the first to be applied in the model, before completed years of education, which came in 5th place, but which has the higher explanatory power in empirical researches on income inequality.

In short, selecting variables in the demand for insurance reveals the importance of role in the family and education, but does not give room to other demographic targeting variables suvch as race or religion, although it enables a geographical targeting. Selected economic variables perform a crucial role in the demand for insurance with a special emphasis on the economic class. On the other hand, the individual income is not considered in any of the estimated models. This point has fundamental importance not only for the aggregate demand for insurance, given the relevant change in the income classes' composition in the last years in Brazil. In short, the demand for various types of insurance and micro-insurance are highly related to income. Income that matters to the private demand for insurance is the household's and not the individual's. Incidentally, the economic class based household per capita income is used in the definition of micro-insurance.

POF's problem is that it is only available for 2002-03. We developed a methodology based on the more recent evolution of the income classes; and some counter-factual exercises enabled us to obtain a more updated scenario about the size of the insurance market in Brazil. The magnitude of the income effect in the period was a 15,6% growth in the rate of access to insurance, not considering the 9% of population growth in the same period. In order to have a clearer idea, this magnitude is superior to the 14,6% increase that would have been observed if each Brazilian, keeping his respective income, began having access to insurance as observed in Sao Paulo metropolitan area, the most developed in terms of insurance in Brazil.

If we add up all effects, the accumulated increase from 2003 to 2009 in the rate of access to private insurance in Brazil would be 44,3%. This would correspond to a second stabilization in the life of Brazilians, comparable to the launch of the Real Plan, when instability of individual income fell sharply. The growth in the income pie, more strongly in the lower income groups, gave the poor to the insurance market, now it is necessary to give the market to the poor. This is the Brazilian agenda for the next decade, where the challenge of developing micro-insurance is situated.

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