SOCIAL SECURITY AND RETIREMENT IN BRAZIL: RELATION TO YOUTH UNEMPLOYMENT AND HEALTH TRENDS*

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Resumo

Há uma preocupação generalizada sobre como o envelhecimento da população afeta variáveis macroeconômicas e o equilíbrio fiscal do setor público. O rápido envelhecimento da população apresenta um dos maiores desafios das políticas públicas no Brasil e em outros países ao redor do mundo. Uma segunda questão relacionada é como o sistema de previdência social brasileiro afeta o comportamento de aposentadoria dos trabalhadores mais idosos (Wise, 2004). A literatura sobre os determinantes da aposentadoria masculina nos países desenvolvidos é extensa (Gruber e Wise, 1999; 2002; Costa, 1998). Entretanto, pouco se sabe sobre possíveis impactos dos sistemas públicos de previdência, em especial em países com grandes sistemas públicos sobre essa relação. Em trabalhos anteriores, Queiroz (2005, 2006, 2008) discutiu como a evolução do sistema previdenciário no Brasil pode ter tido impactos na decisão de aposentadoria dos trabalhadores brasileiros. A principal explicação para a reforma antecipada nos países desenvolvidos é a existência de programas de pensões generosas (Gruber e Wise, 1999), e aumento da renda e da riqueza dos trabalhadores (Costa, 1998). Todavia, há diversas críticas aos resultados apresentados por Gruber e Wise por duas razões principais: primeiro, que a saída dos idosos do mercado de trabalho cria vagas para os trabalhadores mais jovens e, em segundo lugar, que os trabalhadores mais velhos deixam a força de trabalho devido a questões de saúde. Nesse sentido, o objetivo desse artigo é investigar essas duas hipóteses para o caso brasileiro ao longo das duas últimas décadas. O Brasil é um estudo interessante e importante pois vem passando por um período de grandes mudanças demográficas, que tem importantes impactos sobre a economia e o sistema público de previdência, e também está observando uma mudança no perfil de doenças da população que possibilitam a investigação adequada do problema proposto anteriormente.

Palavras-chave: retirement, health, youth unemployment, Brazil

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1. Introduction

Changes in population age structure poses an important challenge to economic growth, economic development and public transfer programs across the world (Lee and Mason, 2011). More specifically, there is a huge concern on how population aging can impact on the public pension programs in different developed and developing countries. The impact of population aging on public pension programs is amplified by the patterns of labor force participation of the elderly. As mortality declines and life expectancy and health conditions improve, one could expect that individuals would work stay longer in the labor market, thus reducing the impact of population aging in the public pension programs. However, historically it is observed a long-term trend decline in the labor force participation of older workers (Costa, 1998; Burtless & Quinn, 2001; Gruber & Wise, 1999; 2004). Contrary to the past, most workers today enjoy a long and healthy period of retirement, in Brazil, for example, Queiroz (2007; 2008) estimated that the duration of retirement has doubled between 1960 and 2000. These changes are a paradox since at the same time people are entering the labor force later, because of increasing educational attainment, living longer; they are leaving the labor force at younger ages (Wise, 2010).

There are six main explanations for pattern of labor force participation of older persons. First, the existence of public pension systems (Gruber & Wise, 1999; 2004); second, higher income and expansion of the leisure class (Costa, 1998). Third, Profeta (2004) argues that aging population increases political pressure on social security policies affecting labor force participation at older ages. Forth, Clark et al (1999) points that rising income and socioeconomic changes tend to affect negatively the proportion of the elderly that stay in the labor market. As mentioned, there is a large body of research discussing the four theories presented above.

There are two less studied factors that are normally brought into the discussion of trends in the labor supply of the elderly. First, it is argued that changes in the elderly labor force participation have an important impact on the jobs available for the youth. In this sense, the labor market functions as a “closed-box” and new workers would only be able to find work if older workers leave the labor force. The second point is that, as mortality declines individuals with worse health reach older ages and are less able to stay in the labor force. The aim of this paper is to analyze these two theories in the context of the Brazilian economy. I use data from the Brazilian household survey (PNAD) to investigate the relation between elderly labor force and youth unemployment and Census data, from 1960 to 2010, and life-tables prepared by Celade to study the relation between health and labor force participation. The results indicate that there is neither relation between labor force participation of older workers and changes in the unemployment of younger workers nor a strong relation between worse health and labor supply.

2. Related Literature

Several studies in the United States and Europe show the impact of pension regulations, income growth and behavior on labor force participation rates (Gruber and Wise, 1999; Wise, 2010).
Hurd (1990) shows the retirement peak at age 62 after the introduction of early retirement provisions in the 1960s. However, Krueger and Pischke (1992) find little empirical evidence linking changes in social security wealth and retirement behavior of older workers. The authors argue that the reduction in wealth did not affect downward trend in labor force participation. In other countries, the effects of pension provisions are much larger than in the US. Borsch-Supan (2000) analyzes Germany and other OECD countries and finds large disincentives to work in the public pension programs. Baker, Gruber and Milligan (2003) find that the Canadian pension program has significant impacts on retirement, and that public policy can create incentives for workers to stay in the labor force longer. Profeta (2002) shows that changes in the population age structure are one of the main determinants of the size of the public pension programs and of retirement policies in a series of OECD countries. She shows that as population ages, political pressure increases to maintain or create better conditions for early retirement. Finally, Clark et al (1999) argue that economic development, and rising income, plays an important role in the declining trend in the elderly labor force participation rates. In an international comparison analysis, Gruber and Wise (1999; 2004) showed that for a series of developed countries there are very large incentives to leave the workforce earlier and collect pension benefits. They also show that countries could create incentives for additional years of work by create fair compensations for an additional year of work compared to the current laws in place.

In a more recent project, Gruber, Milligan and Wise (2010) studied the relation between trends in elderly labor supply, more specific retirement trends, and changes in youth unemployment. The study, for 12 countries, investigates the common idea that incentives to early retirement were necessary to create jobs for younger workers as they would replace older individuals in the labor force. The study, carried out by research specialists in each country, found no evidence that early retirement trends increase the employment opportunities for younger workers. Kalwij et al (2010) also investigate the same issue for 22 OECD countries showed that older and younger workers are not substitutes and changes in the employment of workers aged 60 and above have small impacts on youth (16-24) employment. They concluded that policies to discourage early retirement will have no impact on the unemployment rates of young workers.

There is a large body of research on the how health status affects the labor supply of the elderly (Perez et al, 2006; McGarry, 2004; Hagan et al, 2009; among others). In general, these studies try to relate how health status directly impacts one’s decision to remain or leave the labor force in a micro perspective. In the case of Brazil, Perez et al (2006) showed that individuals in poor health conditions is related to lower labor force participation and, for those working, less hours worked per week. It is important to stress that they found stronger effects for males than for females. Most of the analysis mentioned before is based on one point in time and tries to estimate individual’s probabilities of working/retirement. There is less work in a historical and macro perspective. Milligan and Wise (2011) showed that, over time, health conditions in different countries are improving as labor force participation of the elderly declines. In the same vein, Cutler et al (2011) estimate that elderly labor supply could be substantial higher (15 percentage points) between ages 60-65 given current estimates of health status in the USA.

The issue of the relation between elderly employment and youth unemployment and health and labor supply, however, should be tested in a less developed economy, especially one going over important changes in the population age structure. In addition to the trends in the labor force of the elderly a larger share of working-age population should also have an impact on the
employment rates of the youth. The research on the impacts of public pension system on labor market behavior in Brazil is still incipient. Most of the research concentrates on the impacts of population changes and fiscal impacts of the program to the economy. These studies analyze the idiosyncrasies of the pension system and its impacts on the society. Most of the studies focused on the fiscal impacts of social security regulations and how different economic groups receive more or less benefits from the program (Afonso and Fernandes, 2004; Rocha and Caetano, 2008, among others). However, there are important research on the impacts of the pension programs and its rules and regulations on the labor supply of the elderly. Leme and Málaga (2001) study the impacts of the social security rules on investments in human capital and duration of labor force participation in comparison with a capitalization regime. They find that the pension scheme does not induce further investments in human capital due to the provision of pension benefits at fairly young ages. Legrand (1995) uses 1980 census data to study effects of the social security system and of other variables on men's retirement behavior in Brazil. The results indicate that the system has strong effects on retirement. Self-employed and employers have lower retirement propensities. Education and high levels of income are associated with lower retirement rates. Carvalho-Filho (2008) shows that the social security reform of 1988 impacted the labor supply of rural workers. The author finds that rural workers leave the labor force as soon as pension benefits become available. Finally, Queiroz (2007; 2008) show that there was a decline in the labor force participation of the elderly since 1960 and that more educated workers in the urban areas have higher propensity to retire than less educated workers.

3. The Brazilian Public Pension System

The pension system in Brazil consists of three main segments: the general system (private workers), the civil servants system, and the other general private funded systems. Most pension system is based on the PAYGO scheme (Bonturi, 2002). The country has also a large non-contributory system with means-tested eligibility that provides benefits for low-income elderly. Public expenditures on social security benefits and other forms of elderly support amount to 12% of GDP (Brasil, 2003).

The Social Security system for private workers (general system) is an unfunded defined-benefit program. There is still debate regarding when it began. In 1888 some measures were taken to provide pension benefits for postal workers and employees of the national press. In the following years, retirement benefits were extended to railroad workers, employees of the Ministry of Finance, the Mint and the armed forces. In 1923, the Lei Eloi Chaves (legislation) was approved to regulate social security for both civil servants and private sector workers. This law decentralized the pension system, as each company became responsible for its own employees. The first reform happened in 1933 when the pension funds became structured by professional categories (Leite, 1983). The general pension system was centralized only in 1966, when the House of Representatives approved the Social Security Ordinary Law. The National Social Security Administration, INPS, incorporated all the revenues and expenditures from sector-specific programs as well as its assets and liabilities. Another major change during this time was in the scheme of the program, which changed from a capitalization system to PAYGO (Leite, 1983).
The last major reform occurred with the 1988 Constitution, which extended mandatory social security coverage to most of the previously excluded groups, including rural workers, without requiring equivalent increases in revenues from contributions. Other measures also made the system more generous than before: establishing the minimum wage as the lowest benefit paid by the system, indexing all pensions to the minimum wage, and reducing minimum retirement age (Stephanes, 1998).

Until 1998, full pension benefits were granted to all workers who had contributed for a minimum of 10 years to the system, have reached normal retirement age through the Old-Age Pension Benefit (65 for men and 60 for women), or could prove that they have been working for a certain number of years with the Length of Service Pension Benefit (35 for men and 30 for women, but without requirement of contribution for the same period of time). In addition, special retirement schemes existed that granted proportional retirement benefits for individuals who had worked for 30 and 25 years, for men and women respectively. The benefits were computed based on the last 36 months of activity (Brasil, 2002). The level of benefits is relatively high, old-age benefits recipients receive, on average, 3 times the minimum wage, and the length of service benefits is 2.5 times higher than the old-age benefits. In recent years, the system has been facing budget shortfalls, which have gradually increased after the new regulations were implemented in the early 1990s. In 1996, the deficit was equal to 0.1% but increased to 1.7% in 2004. The implicit debt, a long term measure of the system's financial adequacy, is also large and amounts to about 350% of the GDP (Holzman, et.al, 2004).

Alongside the general pension system, civil servants have their own pension program, which is also an unfunded PAYGO defined benefit program. Although smaller in absolute numbers when compared to the general program, expenditures with the civil servants are large, reaching 4.7 percent of the GDP in 2002. The program is a complex chain of federal, state and local systems, including special programs to different civil servants categories. Benefits are more generous in the civil servant program: replacement rates are higher and time of contribution to receive full benefits is shorter (Medici, 2001).

4. Data and Methods

I divided the analysis in two parts. The first part discusses the relation between health status and labor force participation of the elderly. The second part aims to examine the impact of the elderly labor force participation on youth unemployment in Brazil. I use different datasets and methods to address each question.

4.1 Labor Force and Health Trends

I use Brazilian census data to study historical trends in labor force participation rates. The data - 1960, 1970, 1980, 1991, 2000 – are public available at the Integrated Public Use Microdata Sample (IPUMS) and 2010 census available from the IBGE website. In those years a short and a long enumeration forms were used. IPUMS uses United Nations (UN) and ILO labor force definitions to maintain consistent across time and countries, however they caution that small differences exist which can affect analysis of the results. Health status in this paper is measure
by age-specific mortality rates. The choice of mortality is justified because it is available for a long period of time and it is easily comparable over time. Anyways, results should be taken with caution because mortality trends is not the same as morbidity trends, and the latter would be more related to the question I am studying here.

I estimate labor force participation rates using Brazilian Census. The Brazilian census enumerates the population aged 10 years and above who are in the labor force. Until 1950 the unemployed were not enumerated as being in the labor force. From 1960 on the enumeration form was adjusted to incorporate this group in the labor force, consistent with the International Labour Organization definition. The enumeration of labor force is stable and consistent over time, however there are some limitations. The labor force is made up by the employed population plus the unemployed. Employment status is fairly consistent over time. Paiva (1984) argues that from 1960 to 1980 the definitions are very similar with small differences on the order and the phrasing of the questions, which might affect the enumeration of the economic active population. The problem arises because of changes in the unemployment concept. There are two main differences: first unemployment became more strictly defined, and second the period of reference changed in 1991. The first three censuses used the reference week to determine unemployment status. The last two also use a reference week but only consider unemployed those who were not looking for a job within the last two months in 1991, and the last month in 2000.

I obtained mortality data from the Celade life-tables constructed from 1950 to 2010. The data are available in 5-year age group. I use standard demographic methods to transform the data into single year-age groups. In this study, I focused the labor force and health status of males. Female labor force participation, is a very important matter, but has changed a lot in the last few decades what would demand a very different approach to analyze the question.

I study the question by a detailed descriptive analysis of the trend in mortality and health status for older workers in Brazil. I also describe the trends in labor force participation and relate changes in the elderly employment to recent changes in health status.

4.2 Retirement and Youth Unemployment

In this paper, I use data from the Brazilian household survey (PNAD) to gather information on elderly employment and youth unemployment. PNAD allows me to construct the longest series, from 1981 to 2009, of these two variables in addition to a series of socioeconomic and other control variables. I am aware of the limitations of using PNAD data to study unemployment (CITAR), but there are other studies about unemployment in Brazil using the same data (Reis and Camargo, 2007; Oliveira et al, 2009). In order to test the results, I perform similar analysis using data from the Employment and Unemployment Survey carried out by SEADE-DIEESE in Sao Paulo.

Before turning to formal statistical analysis, I present graphical evidence that illustrates the relation between elderly employment/labor force participation and youth unemployment in Brazil. I pay close attention to years that were characterized by important changes in the structure of the public pension system in Brazil (1988 and 1998). The second part of the analysis
uses a simple regression model on the relation between labor force participation of the elderly and employment of younger workers. I test different specifications of the model: model without controls, model with controls (GDP, GDP growth, % population working age, % elderly, dummy for change in pension system). I also tested the model using different lags, that is, youth unemployment in time t is regress to elderly employment in time t-n. I tested with n equals to 1 and 3, mostly because of sample size.

5. Results
5.1 Preliminary Evidence

The trend in labor force participation for Brazilian male workers shows significant changes in the last decades (Figure 1). It is clear that the length of working life shrank over time. Labor force participation rates of young individuals have declined because of the increase in educational attainment. Based on census data I calculated that 95% of the population aged 10-14 years was in school in 2000 compared to 54% in 1960. The rates have also declined for older workers. In 1950 almost 90% of the population aged sixty to sixty-four years was in the labor force, and this number has declined to 65% in 2000. The same rate of decline is observed for younger old workers. The fall in economic participation is even greater for older workers, those above sixty-five years of age: 30% of them were in the labor force in 2000 compared to over 60% in 1950.

Figure 1 – Labor Force Participation Rates, Males, Brazil, 1950-2010

Labor force participation rates fell for workers of different socioeconomic backgrounds. I use years of schooling as a proxy for socioeconomic status (SES) and estimate participation rates using census data from 1960 to 2000 by four different levels of education: 0 to 4, 5 to 8, 9 to 11 and 12 and more years of schooling. This measure is highly correlated with the general socioeconomic status of the individual and is preferred to other measures of SES (e.g. wealth or income) in this study since it offers better comparability among age groups.
I also estimated labor force participation rates by educational groups overtime. In 2000, participation of workers aged 60-64 and 65-69 years old, for all SES groups, intercept at the same levels around 50% and 40%, respectively. For older workers, those above 70 years of age, the rates converge at lower levels around 20% participation rates (results not shown). The results show a decline in the participation rates for all SES groups, but steeper for the oldest age group (65-69). The decline is also steeper for the low SES, which might be explained by the universalization of the access to social security benefits. High SES workers have lower participation rates at all times but their decline over time is slower than that of low SES. From 1960 to 2000, the participation rates of workers aged 65-69 years declined 33 percentage points for low SES workers and 20 percentage points for the high SES ones. The lifetime earnings of low SES workers are much lower than those of high SES workers and cannot be the only explanation for the decline and convergence in participation rates. The trend reflects the increase in the coverage of the social security system in the country, a move away from agriculture work and increase levels of income of the older population in the past half-century. Queiroz (2007) studies urban areas in Brazil and also observed that workers with low and high educational attainment have higher probabilities of retirement than those in the middle of the educational distribution.

5.2 Labor Force and Health Trends

Figure 2 shows a well known fact of evolution of mortality in Brazil, the decline of mortality rates. I concentrate on mortality rates for males aged 60, 65 and 70. The decline in mortality rates is occurring since 1950; with a small increase in 1985 (might be a feature of the data). The mortality rates continue to decline since then. Campos and Rodrigues (2004) showed that a fast decline of mortality rates for the elderly, both males and females, in southeast Brazil in recent decades. They estimated a decline of around 2% per year for individuals aged 60 to 89.
Figure 3 depicts the probabilities of death by single years of age from 1950 to 2010, from ages 45 to 79. I observe a steady decline in the probabilities of dying for all ages over time. The decline is faster for males above age 65. Assuming that mortality probabilities are a good proxy of health conditions, the steep decline in the force of mortality indicates clear improvements in the population health, especially above age 45, over time.

An additional way to look at improvements in mortality, and health status, is to observed at what age in a more recent year we observed a similar rate several decades ago. In other words, one could ask the question of how old you should be to feel like a X years old in 1950?. Figure 4 shows the age equivalent mortality rates of a male aged 65 and 60 in 1950. In Brazil, males aged 74 in 2010 had about the same mortality rate as a male age 65 in 1950, a 9 year improvement. Also, males aged 71 had about the same mortality rate as a male aged 60 in 1950, an eleven years improvement.
Figure 4 – How old should you be to feel like a 65 (60) year old in 1950? Males, Brazil

Figure 5 and Figure 6 present the historical change in employment by age and in the relation of employment and health status (measure by mortality rates). Figure 6 depicts labor force participation of the elderly in 1960 and 2000, for simplicity. It is observed that labor force participation of males is marked by a steep decline, especially at older ages. For example, labor force participation rates at age 60 in 1960 were around 85% compared to about 60% in 2000, a similar value is observed for 2010. Queiroz (2008) and Carvalho-Filho (2008) provide a review of possible explanations for the observed trend in labor force participation of the elderly in Brazil.
Figure 6 concentrates on the relation between employment (labor force participation) and health (mortality rates). The idea is to understand how employment varies based on the health status of the population. The figure shows the relation between labor force participation and mortality rates by age in 1960 and 2000. The general result showed by the relation is that employment rates today are much lower as the health of the population improves. For instance, if we take labor force participation at 60%, it is observed that the mortality rate was about 3% in 2000 compared to 4% in 1960. In other words, for 60% of males to be in the labor force in 2000 they had to be in much better health than those in the labor force in 1960. A different way to look at it, the results indicate that at the mortality rate of 2% there were about 75% males employed in 2000 compared to about 90% in 1960.
This initial analysis gives strong evidence that the decline trend in the labor force participation of elderly males in Brazil cannot be explained by health status. The results showed before indicated that as health status, measured by mortality rates, improve the labor force participation of older workers decline substantially. I also looked at other measures of health status in Brazil, but it is not possible to perform a long term analysis due to data limitations. The results indicated that males aged 60 to 65 have very similar health status (measure by self-rated health and happy life expectancy) as males aged 55-60 and have very little worse health than those aged 50 to 55. This indicates that a large part of those not working beyond age 60 cannot be explained by their health status. It is important to stress that there is a large variation in health conditions across socioeconomic groups, and this should also be taken into account in future analysis.

5.3 Retirement and Youth Unemployment

Before I turn to more formal statistical analysis, I show the relation between elderly employment and youth unemployment using aggregate series of labor force participation and youth unemployment from the PNADs and PED-DIEESE-Sao Paulo. Unfortunately, there were some changes to the PNAD survey which creates some limitations to the analysis of labor force participation and the PED survey does not have a very long time series to allow a more detailed analysis of the trends in the labor market.

Figure 7 shows the labor force participation rates, from 1979 to 2010, for males from aged 55 to age 64 and from ages 16 to 24. The main changes in the social security program (1988 and 1999) is marked in the vertical lines – they marked the large reform of the pension program in the 1988 constitution and the implementation of the 1998 reform by Cardoso’s government. The trends in old-adults labor force participation is very stable over the period of analysis, but I observe a small decline in labor supply after the 1988 reform, especially around 1992 and 1993, and a steep decline in the years before the implementation of the Fator Previdenciario. The impact is stronger for workers aged 55 to 64 that could be affected directly by the changes in the legislation. The elderly labor force participation show very small fluctuations over time, and an increase in the last years of the 1990s. The evolution of the youth labor supply is downwards, showing signs of decline especially from 1990 on. The change in the labor supply of the young seems to be much more related to important changes in the educational attainment of this group than to variations in elderly labor supply. The graph does not seem to show any strong correlation between the two variables.
Figure 8 shows the relation between elderly employment ratios and the youth unemployment rates. The results show an increase in the youth unemployment rate starting around 1995, but the employment rate of the elderly did not change much, if anything we observe a small decline in the labor force of the elderly. The figure does not indicate that the transition of the employment of older workers has any implication in the trajectory of the youth in the labor market. Figure 9 shows similar data for Sao Paulo Metropolitan Area (RMSP) using information from SEADE, but a shorter series. We do not observe any relation between changes in the employment of the elderly and youth unemployment. In fact, in Sao Paulo I observed that from 2005 on there was an increase in the labor force participation of the elderly and a decline in the unemployment rate of the youth. I also observe that the decline in the unemployment rate of the youth cannot be explained by an increase in the number of inactive, since the labor force participation rates do not show significant changes during the period of analysis.
I then move on to a more formal statistical analysis to study the relation between old age labor force participation and youth unemployment. I follow the simple regression specification proposed by Gruber and Wise (2010):

\[ \text{Unemp}_{\text{youth}} = \alpha + \beta \text{LFPR}_{\text{elderly}} + \gamma X_i + \varepsilon \] (1)
where, $Unemp$ is the unemployment rate of the youth (measure from PNAD, PME and PED), $LFPR$ is the labor force participation rate of the elderly, $X$ is a matrix of observable variables that might affect employment and unemployment rates; such as GDP growth, population age structure, educational attainment; and an error term.

I estimate the proposed model with different specifications. Table 1 reports the coefficient of the relationship between elderly labor supply and youth unemployment. The top part of the table report the results without considering any control variable and the bottom part reports the same coefficients in models controlling for different characteristics. The first row, top and bottom panel shows only a relation between the two variables and does not aim to show any causal relation. I also show the same relation using a lagged variable for the elderly employment. Finally, I related changes in the youth unemployment to changes in elderly employment over 3 years.

**Table 1 – Estimates of the Coefficients Relating Elderly Employment to Youth Unemployment, Brazil, Males**

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>No controls</td>
<td>0.068 (0.999)</td>
<td>-2.031 (0.177) ***</td>
<td>-0.233 (0.374)</td>
</tr>
<tr>
<td>With Controls</td>
<td>-0.098 (1.065)</td>
<td></td>
<td>-0.433 (0.395)</td>
</tr>
<tr>
<td>1 year lagged w/ controls</td>
<td>0.1395 (1.028)</td>
<td>-0.429 (0.308)</td>
<td>-0.136 (0.412)</td>
</tr>
<tr>
<td>1 year difference w/ controls</td>
<td>4.606 (3.741)</td>
<td>-0.201 (0.450)</td>
<td>0.002 (2.181)</td>
</tr>
</tbody>
</table>

* monthly data, does not include control variables.  
*** significant at 1%

Table 1 reports results using different specifications and datasets (PNAD, PME and PED). It is important to stress that each dataset covers a somewhat different period depending on data availability and the consistency of each survey. The first line reports the basic regression model relating youth unemployment and older workers labor supply without controls. The only model with statistically significant estimates is the one using PME data. The estimates indicate that an increase in the labor force participation of the elderly reduces the unemployment rate of the youth, a result that is contrary to the theoretical model. In the PME estimate I am using monthly data, thus I did not include any control variable. The different specifications indicate similar results, negative relation, but the estimates are not significant. The estimates using data from PNAD and PED are not significant. The only estimate showing that any increase in elderly employment increases youth unemployment is obtained using PNAD data. The other three specifications (control, lagged and difference) indicate a very similar story, that is, I do not observe any relation between changes in old adults or elderly employment and youth unemployment.
6. Discussion

The rapid process of population aging will have huge impacts on the sustainability of the Brazilian pension system. The increase in the old age dependency ratio means a larger number of beneficiaries will depend on a smaller number of workers. The demographic problem is not the sole issue in this matter. There is also a strong downward trend in labor force participation at older ages. Early retirement has increased the dependency ratio more than would be predicted by demographic analysis. Labor force participation rates of older men fell significantly between 1950 and 2010, as in other developed and developing countries. During this time, the Brazilian social security system expanded, absorbing a larger group of the population and helping to accelerate the trends toward early retirement. The trend towards early retirement can also be explained by income growth and better options for the old-age population. In general, there are two main criticisms to this view. The first one argues that early retirement is important to create employment opportunities to young workers, in other words, if the elderly postpone retirement one would observe an increase in youth unemployment rates. The second view argues that elderly leave the labor force earlier mainly because of poor health conditions.

In this paper, I try to discuss and highlight some of these issues in Brazil. First, I show that there is a clear improvement in the health condition in the Brazilian population. Using mortality rates as a proxy of health status, I show that an individual aged 74 years in 2010 face the same mortality risks as 65 years old in 1960. I also look into measures of self-rated health and observed that the percentage of years lived in good health has been increasing since 1998. Moreover, the results from SABE and PNAD health supplements indicate that the health conditions of the population aged 60 to 64 is very similar to those aged 55 to 59, but they have very different patterns of labor force participation. Finally, the results indicate that at the same mortality level (proxy for health status) labor force participation of the elderly was much higher in the past than today.

The results indicate that, on average, older males could remain in the labor force for a longer period than they are staying. However, there are a few caveats to this result. First, it is important to use other measures of health status to perform this analysis, especially in a longitudinal perspective. Second, it is important to stress that there is significant variation in health status across socioeconomic groups in Brazil (Guedes et al, 2011; Perez, 2010), so policies that increase retirement requisites or increase incentives for longer working lives will not impact all population sub-groups in similar ways. In any event, the results indicate a significant potential for labor force participation and employment beyond age 60, and this could be even stronger for future cohorts.

In the second part of the paper, I put forth a second question: how old-age employment is related to youth unemployment? I use three different data sets and both descriptive and regression analysis to discuss the relation between the two variables. As observed for more developed countries (Gruber and Wise, 2010), I do not find any relation between old-age employment and youth unemployment. In the case of Brazil, economic growth and educational variables seem to be much more related to variations in youth unemployment than employment history of the elderly. In future work, I plan to work with microdata, individual analysis, and concentrate the analysis on years in which was observed substantial changes in the labor supply of the elderly or
in retirement benefits take-up rates, such as period around the implementation of the Fator Previdenciario. The analysis presented here used traditional regression models, in further analysis time-series econometrics should be considered in the models.

In sum, retirement is an important stage on one’s life cycle. Contrary to the past, most workers today enjoy a long and healthy period of retirement. In Brazil, the expansion of the social security system, economic development and rising income have allowed more workers to leave the labor market. In addition, improvements in goods and services provided to the elderly have transformed retirement into a more pleasurable and desirable stage of life. The importance of the public pension systems throughout the world is unquestionable, and the well-being of the elderly depends heavily on the provision of income from such programs. However, the necessity to reform the Brazilian pension system is clear. But, there are still several questions on how the reform should take place. One important point, not addressed in this paper, is the evolution of labor demand. As point by Skirbekk et al (2012) cognitive capacity is a better measure of active aging than age itself, and as technology evolves and firms demand different abilities, how older workers will fit this new demand.

7. References


