



## Youth and Elderly in two Latin American Countries: Brazil and Mexico

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### Introduction

In several Latin American countries, the elderly population is growing rapidly, as a result of past population dynamics. Those countries have had an age structure typical of young population on the first half of the past century, and have experienced a sharp decline in fertility in the second half of the century. This combination contributed to the rapid increase in the proportion of older people, while at the same time, countries still have a significant amount of children and adolescents. It is a challenge for public policy to address the needs of these different population cohorts.

As fertility and mortality have decreased in different periods and intensity in Brazil and Mexico, changes in the age structures reflect these differences. The purpose is to evaluate how these demographic factors interacted with the socio economic scene of each country.

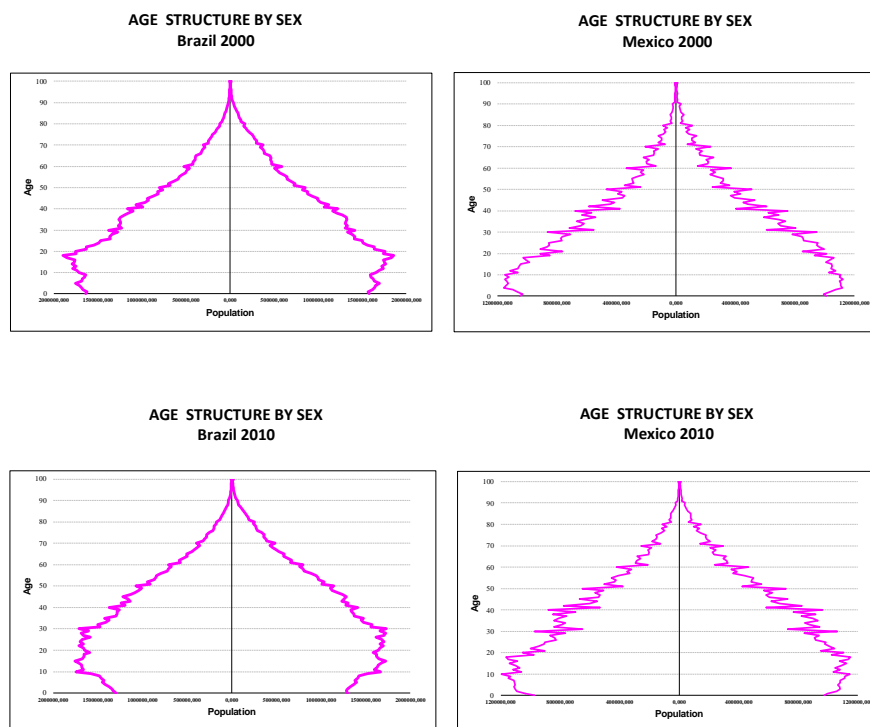
The observation of the differences between both age structures led to the application of a method that allowed observing how population dynamics evolved along time by measuring the variation in size between successive cohorts. As an effect of the influence of variations in the components of population dynamics - fertility, mortality, migration - the sides of the age pyramid may narrow or broaden with the variation in the number of births in each generation. The demographic discontinuities are precisely sudden changes in size of successive cohorts. The paper has two objectives: the first is the comparative analysis between Mexico and Brazil, of past and future trends of the population structure in the context of demographic discontinuities, the second is a consideration about the implications of these developments in the labor force behavior for each country. Data from the Population Censuses for the 1970, 1980, 1990, 2000 and 2010 Rounds of Brazil and Mexico are used to calculate the magnitude and temporal location of discontinuities and its consequences.

### Age structures and demographic discontinuities

The age-sex pyramids of the Brazilian and Mexican population since 1970 were compared. The differences in the age and sex structure become evident when observing the sequence of pyramids: it shows the successive widening and narrowing of the sides of the pyramids in both countries from 1990 to 2010 (Figures 1 to 4).

In Brazil, the pyramid base had narrowed in the seventies, enlarged slightly in the 80's and narrowed once again in the 1991 pyramid. For 2000 and 2010, the base continued narrowing deeply. The Mexican pyramid, narrows for 1990 census; the trend continued for the 2000 and 2010 Censuses, accompanying the decline in fertility. The change in the slope observed during the 80's in Brazil, appears in the 90's, less intense, for Mexico.

### Figures 1, 2, 3 & 4



Source: IBGE, Brazil 2000 & 2010 Population Census

Source: INEGI, Mexico 2000 & 2010 Population Census

### Variations in the size of the cohorts

The method proposed by Keyfitz (1988) allows locating demographic discontinuities, i.e. sharp changes in the size of successive cohorts. These discontinuities in fact correspond to changes in the age pyramid slopes. This method has at least two advantages: (1) the discontinuities become more visible with regard to timing, volume and intensity; (2) evolution of cohort size and intercohort increase can be estimated, even for periods in which no direct data is available.

Figures 5 and 6 show the variation in size of the birth cohorts between 1932 and 2010. In this case ten-year periods were used based on the observation of the structures derived from the 2000 and 2010 Censuses. To ensure that these observations were coherent with those made previously for Brazil (Bercovich et al., 1990), based on five-year intervals it was necessary to estimate the population in 1990 using 1991 data and age survival ratios, based on the IBGE life tables (2003). For Mexico, no conversion was needed.

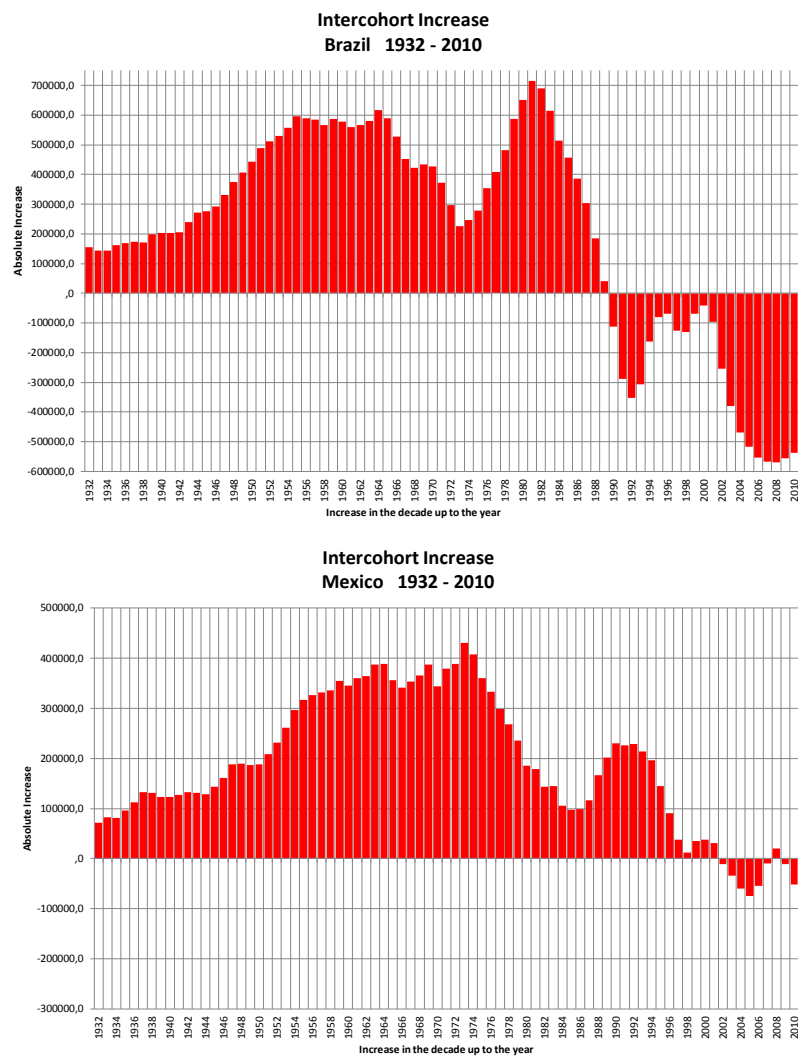
The first major discontinuity in Brazil started in the second half of the Forties, in the post-war, with considerably increase in the number of births due to the significant drop in mortality (Figure 5). This scenario is related to the introduction of antibiotics, vaccination campaigns, in addition to social factors that made it possible for these innovations to be disseminated. It avoided a large number of adult and child deaths, initiating a significant population increase. A similar situation is observed in Mexico (Figure 6). The figures show the onset of the so called population explosion in both countries. In much of the world this onset was especially sudden due to the overlap of the baby-boom in the countries involved in the Second World War with the fall in mortality associated with the dissemination of effective medicines in the others.

Since the second half of the Sixties, a reduction in the increase of the cohorts' size can be seen in Brazil. This period coincides with the introduction in the country of the most effective contraceptives, such as, the contraceptive pill, which certainly caused, associated to the social conditions, a reduction



in fertility and number of births. This phenomenon is reflected in the smaller size of the cohorts in that period. This reduction in the increase between cohorts continued until the first half of the Seventies in Brazil. From the second half of that decade, there was, again, an increase in the number of births. This increase was not due to an increase in fertility, but due to an increase in the birth rate, which was the echo of the great wave of population described above. Indeed, the large cohort of baby boomers women reached childbearing age, and this generated a large cohort of infants.

Figures 5 & 6



Source: IBGE, Brazil 2000 & 2010 Population Census & INEGI, Mexico 2000 & 2010 Population Census

For Mexico, the same reduction in size of the increase between cohorts was observed later in the middle seventies (Figure 6). The same discontinuities can be observed almost 10 years later in Mexico, with less intensity, approximately from the 70s up to second half of the 80s.

The size of the cohorts in Brazil diminished sharply from the second half of the eighties. This reduction resulted in the absolute decrease of the cohorts from the nineties (Figure 5). Not only the



increase in the number of births decreased, but there was an absolute reduction in the number of births. This phenomenon may continue in the form of damped wave, in the future. For Mexico, the decline began in the nineties, and the reduction in the size of cohorts can be noticed from the 2000s.

Mexican demographers, using census data, surveys and other sources, estimated mortality trends since the beginning of the twentieth century. The decline in mortality was stronger during the 50s and 60s, as Zavala de Cosio (1992) argues quoting Arriaga (1968) and Camposortega (1988). The fertility transition was more intense during the 70s. Juarez et al (1989) showed that the fertility decline from 1974 to 1980 was approximately 30%. CONAPO and INEGI also released similar calculations. The timing for the transition in Mexico shows the consistency of the series with the likely evolution of these variables inferred from the analysis of discontinuities.

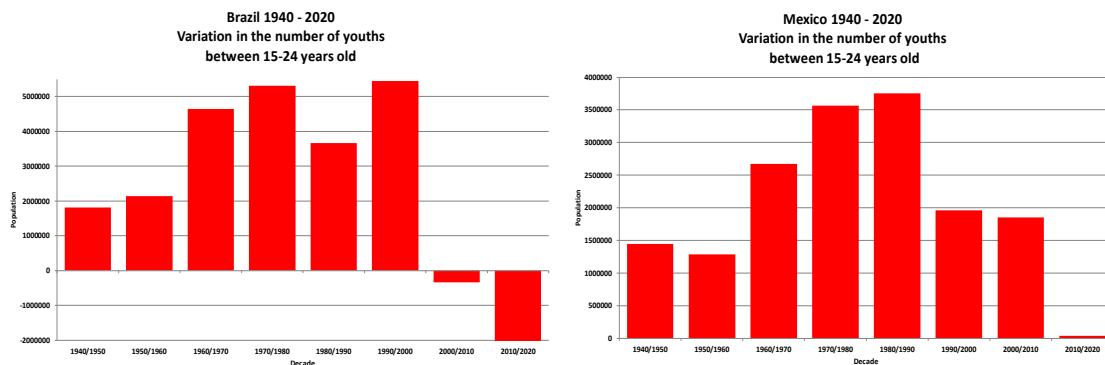
### The Youth Wave

Given the unequal size of different cohorts over time, it is possible to focus on a certain age group and see how the increase or reduction in the number of births is reflected in the size of cohorts of young people or other groups.

This approach to the transformation of age structures led to the detection of the phenomenon of "young waves", i.e. the effect of the waves of births in the variation of the number of youths.

It was necessary to assess the impact of the arrival of these young people to the labor market. What happened with employment as a result of the pressure from this young contingent? It was observed in Brazil a significant increase in the size of these groups in the late Sixties and early Seventies (Figure 7). At that time the Brazilian economy was going through a phase of expansion and dynamism, with possibility of great absorption and therefore there was a high possibility of absorbing this youth contingent in the labor market.

Figures 7 & 8



Source: IBGE, Brazil 2000 & 2010 Population Census

INEGI, Mexico 2000 & 2010 Population Census

Figure 7 shows, for successive decades, the evolution in Brazil of the group of young people 15 to 24 years of age. It can be observed that in the Seventies, there was an increase of more than 5 million young people, a reduction in the growth during the Eighties, increasing once again in the Nineties. For the period 2000-2010, a reduction of the number of young people is observed in relation to the previous decade. The same happens for the period 2010-2020.

The same phenomenon can be observed for Mexico, the young waves were observed during the 70s and 80s (Figure 8). The pressure diminished for the last decade of the twentieth century, and the first decade of this century. But only after 2010, the young cohorts apparently begin to reduce.

Therefore, there are differences between Brazil and Mexico in the possible demographic pressure of youth in the labor market. The decrease in size of the youth cohorts begins in Mexico with a gap of a decade with respect to Brazil.

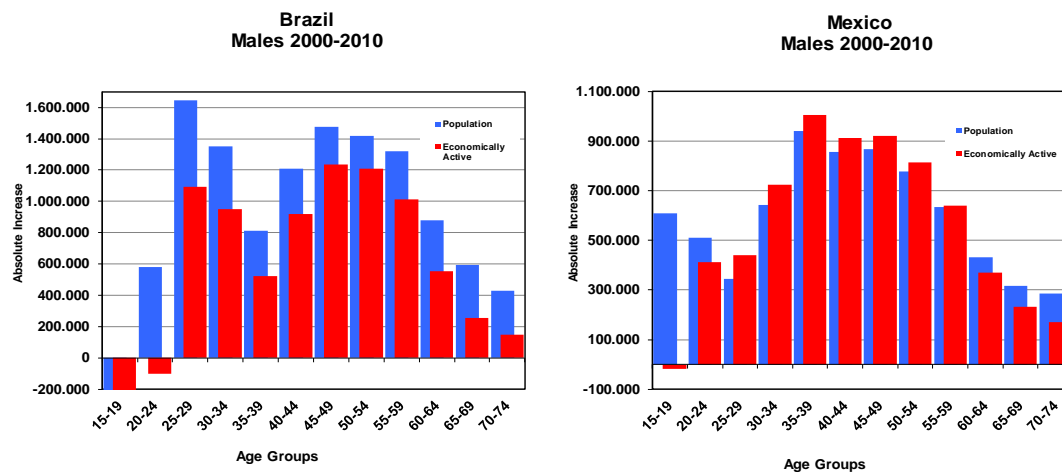


### The Youth Wave and the Labor Market

From the previous section, it can be concluded that from a demographic point of view, the first two decades of this century are witnessing reduced pressure for the entry of young people into the workforce in Brazil. The relationship between the youth wave and the labor market can be observed in Figures 11, 12, 13 & 14, which show the increase in the number of people by age group and the increase in the number of economically active population (EAP). To analyze this item, the data is separated by gender, since insertion into the labor force is different by sex and age.

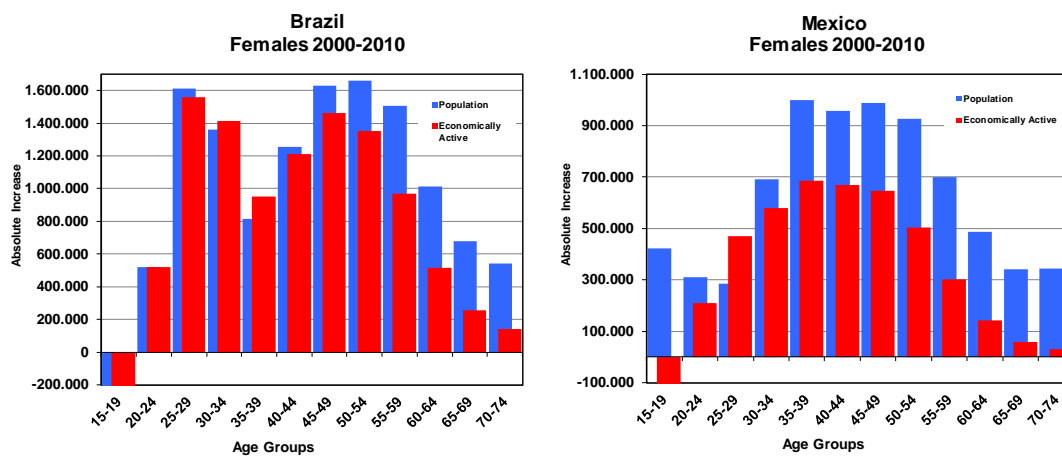
Figures 11, 12

Total Population and Economically Active Population Increase



Figures 13, 14

Total Population and Economically Active Population Increase



Source: IBGE, Censos Demográficos de Brasil 2000 y 2010

Source: INEGI, Censos de Población y Vivienda de México 2000 y 2010

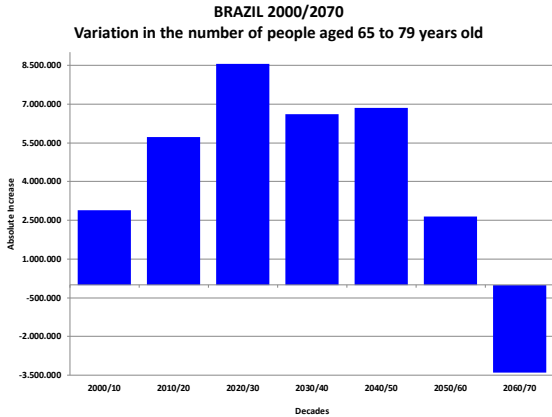
Figure 11, shows this phenomenon during the 2000s for males; the increase in the economically active population did not follow the increase in the population, even with small cohorts. The situation is different for Mexico, where the men older than 25 years, entered in the economically active population. For women is completely different: while in Brazil, the increase in the number of economically active women is bigger than the vegetative increase of the same group, in Mexico the increase of the number of economically active women is reduced compared with the increase of the females in the same age groups.



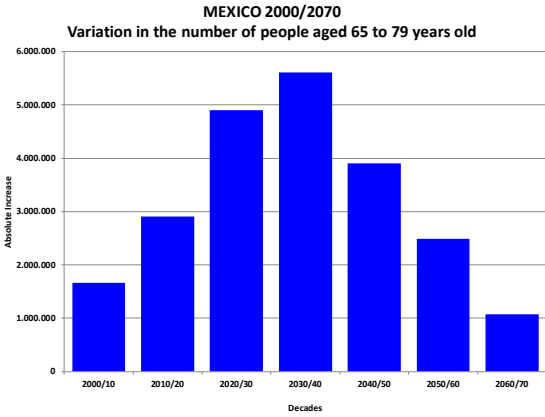
**The Elderly Wave**

The same analyses were done for the elderly people to identify the waves and the possible pressure in the Social Security system. The figures 9 and 10 show the increase in the number of people between 65-79 years old in Brazil and Mexico for the period 2000-2070. The largest increase in that cohort in Brazil will occur approximately between 2020 and 2030, but after 2050, the pressure of the cohorts of elderly will decrease. In Mexico this happens in the next decade, from 2030-2040, and consequently, it will decrease in the second half of the current century.

**Figures 9& 10**



Source: IBGE, Censos Demográficos de Brasil 2000 and 2010



Source: INEGI, Censos de Población y Vivienda de México 2000 and 2010

**Final Remarks**

The effects of the fertility decline in Brazil and Mexico, combined with the previous reduction in the mortality rate, raise challenges for public policy, basically due to the changes these two phenomena cause in the age structure. The differences in timing and size of the cohorts for the two countries may contribute to understand the differences in the behavior of the labor force.

However, an aspect is specially considered here, which has drawn little attention of those who contribute to the formulation of public policy: the phenomenon of successive variations in cohort size. As a wide cohort rises up the pyramid it creates new needs, requiring differentiated responses from the social system. This shows the advantage of focusing on the increase in the absolute number of individuals in each cohort when the purpose is to contribute to public policy.

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