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DEMOGRAGPHIC BONUS OR MALUS IN ROMANIA

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Abstract

Age structural transition is both a consequence and a component of demographic transition. Between two demographic problems perceived as "malus", the excessive growth of the population and ageing, are one or more periods of demographic "bonus". The "demographic windows" open for the population of Romania are changeable, but only with difficulty, in periods of "bonus" because of numerous turbulences in the age pyramid. This chapter describes the age pyramid in Romania at the last census (2002) by referring to two other countries in similar situations: Russia and China in the year 2000. The nature and process of the age structural transition in Romania are then analyzed using retrospective data and indexes derived from three variants of projection for the period 2002-2055. In the more or less near future, different mechanisms are possible, initiated by the increased weight of the large functional age groups that can generate demographic "bonuses" for lasting development, but everything depends on the magnitude of turbulences and the suitability of the public policies that are put in place. The statistical analysis of the correlation between economic development and functional age group structure for the period 1960-2000 shows that these mechanisms, potential sources of "dividends", have hardly worked in the past. The question is asked if, after the year 2000, when there will be other periods of demographic opportunity and when the economy will be directed more by the rules of market economy, it will be possible to profit therefrom.

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1. Introduction

One of the oldest fears concerning the evolution of the population was its capacity of excessive growth in relation to economic development. This idea was developed at the end of the eighteenth century by Malthus, whose *Essay on Population* brought about the development of demography as an academic science. Today, this fear no longer exists, or at least it is no longer generalized on the global level. The accelerated growths observed in the nineteenth century in the European populations were gradually replaced by less rapid, and then null, evolutions and a new theory, that of demographic transition, has shown how economic development leads to a halt in growth and the stabilization of the population. Demographic transition is today achieved in the developed countries, none of which continues to grow, and it is well established in all the other countries of the world. The fear of the excessive multiplication of the population no longer exists, at least on the long term. Moreover, in a large number of countries, decline, negative growth, is already in place.

However, another fear is on the agenda, that of demographic ageing. This is seen as a consequence of the process of demographic transition, which establishes demographic regimes in which the age structures are much older than initially. In addition, if the fertility transition continues, maintaining itself for a long period below the necessary replacement level of generations, a diminution of population sizes and an accentuation of the reversal of the age pyramid going well beyond the currently expected scenarios will be observed.

Thus, it can schematically be said that there are two major challenges for diverse populations in different stages of their development: rapid growth and pronounced ageing. The two problems staggered in time because they intervene, on the one hand, at the onset of the process of demographic transition and, on the other hand, after the inauguration of the fertility decline, which is generally much later. They are both characterized by a relation of increased dependency, but of a totally different nature: while during the first stage of age structural transition, the proportion of young people has the most weight, in the last stage the proportion of the elderly is largely preponderant. The two

situations have serious implications for economic development because of the presence, in both cases, of a large proportion of non-working persons in the population.

Economic demographers have drawn attention to the fact that between these two periods of demographic malus, there is a period of bonus, called "window of opportunity", when the share of working-age groups increases and the dependency ratio decreases, a period that can become a phase of economic expansion. During such a period, social sector expenditures diminsh because of a reduced demand for health services, corresponding to a population in which young and old are less numerous, and also because of a lower demand for educational services because of the decline in the school-age population. The most typical case of such a situation has been observed in the countries of East Asia, where the "economic miracle" occurred during such a period of demographic bonus. Navaneetham (2002) cites several studies that have shown that age structural transition has greatly influenced economic growth through the increase of investment and savings, and several studies on Asian and non-Asian countries have found that the growth in the size of the working-age population has positively influenced economic growth, while the growth of the total population had a negative effect.

But there are a few populations in which the period of the demographic window is characterized not only by a low dependency ratio (in general), but also by a high variation of generation sizes that enter into or leave the various functional age groups. These are the populations marked by multiple demographic waves and above all those that show strong demographic turbulences. The question that arises here is whether these situations can be considered as periods of demographic bonus (or opportunity) for a lasting development or if, on the contrary, they can deteriorate into periods of demographic malus.

We will not analyze all the countries that belong to this category but, before examining the situation in Romania, will look at the age pyramids of a few other countries in order to observe whether the large turbulences are always associated with major political turnarounds.

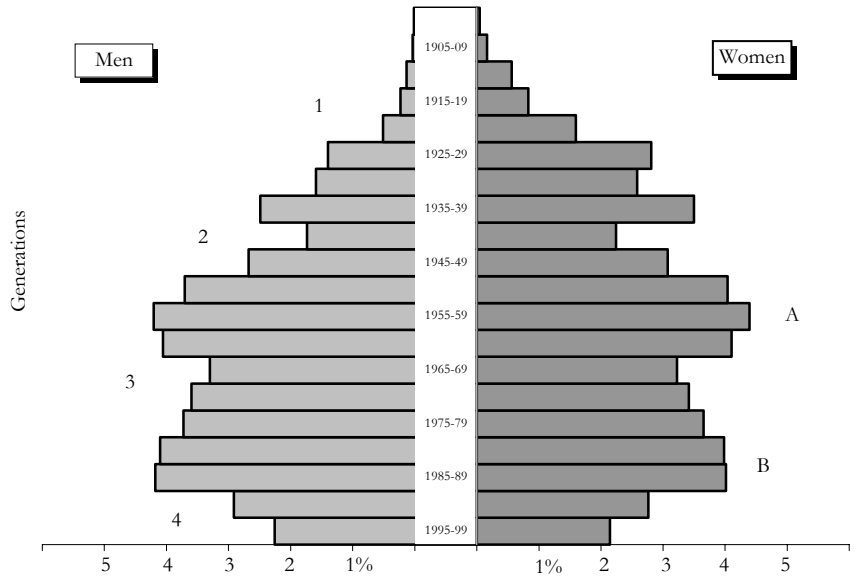
Casellie *et al.* (2001) cite three examples of strong demographic turbulences: Russia, China and Romania. The age pyramids of these

countries (Figure 1, a-c) show discernable irregularities even regarding the variant according to quinquennial age groups.

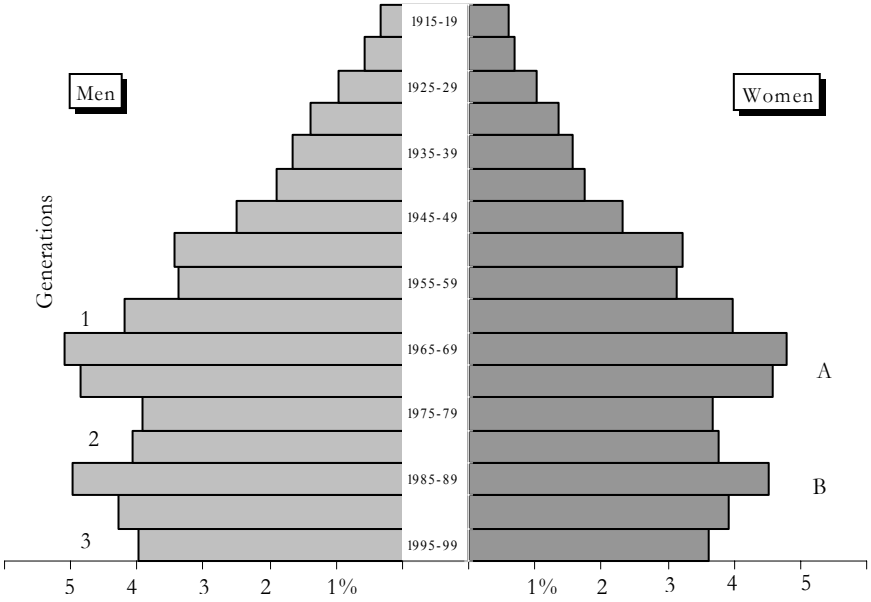
For Russia, World War II had consequences for the age pyramid that are still visible in 2000. Not only do the massive losses (nearly 20 million deaths) provoke an initial trough in the upper part of the pyramid (point 1), above all among men, but the birth deficit of the years 1940-1944 (point 2) was so large that it continued to generate, by an echo effect at intervals of around 25 years, two other troughs (points 3 and 4). The wave in the 1980s (point B) is yet more pronounced because it is also due to the effects of pronatalist policies put in place at that time. After 1990, when the transition to a market economy had put an end to these policies, the number of births fell by half in only ten years (from 1989 to 1999).

Figure 1
Age pyramids in 2000: Russia, China, Romania

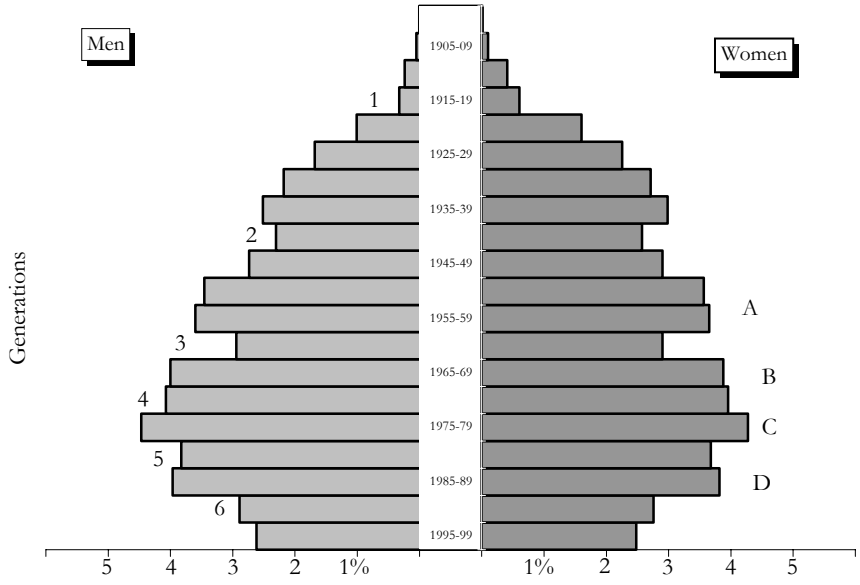
a) Russia



b) China (http://www.census.gov/ipc/)



c) Romania

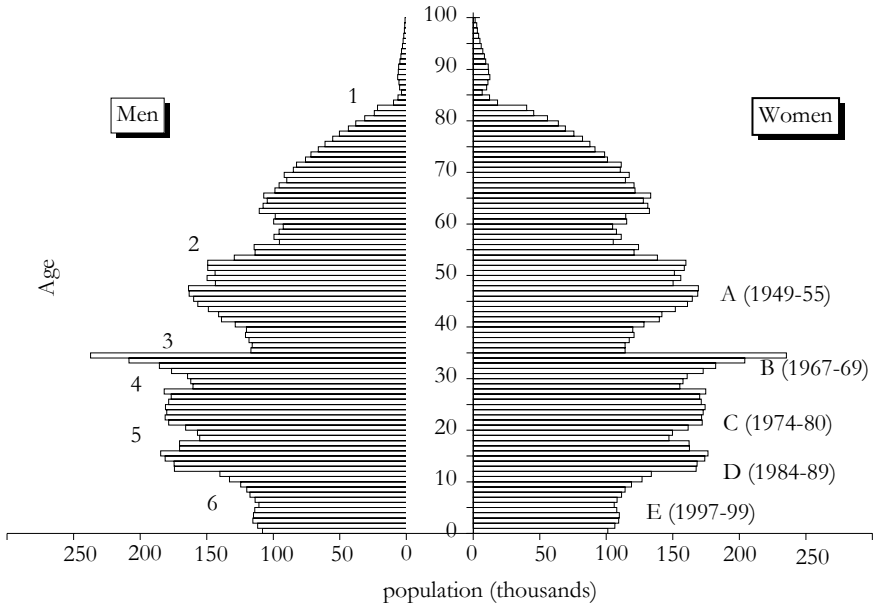


On the pyramid for China, one sees three troughs (points 1, 2 and 3) and two waves (A and B; see also the chapter by Yan Hao in this book). The first trough corresponds (in part) to the period 1959-1962, the period of the "great leap forward". Not only did this abrupt political change cause between 15 and 30 million deaths (Casselli *et al.* 2001; chapter by Yan Hao in this book), but the crisis entailed a slump in the birth rate (less visible on the age pyramid according to quinquennial groups), because of the forced separations of numerous couples as well as the attitude of others who avoided giving birth to children doomed to famine, and the mortality due to the crisis affected children in particular. The second trough (2), from the mid-1970s to the mid-1980s, began with the launching of the one-child policy and is later accentuated by the effect of the inertia of the first trough. The second trough follows the wave of the 1960s and 1970s (A) corresponding to the political turnaround of the "great Cultural Revolution", the echo effect of which can be seen 20 years later (wave B in the Figure).

The age pyramid according to quinquennial groups for the year 2000 in Romania shows still more waves and troughs than are to be observed for Russia and China. They can be followed more closely on a more detailed and more recent pyramid constructed with the data from the census of 18 March 2002 (Figure 2).

Apart from the two troughs at the upper part of the pyramid (points 1 and 2) and the corresponding waves, due to the birth deficits of the two world wars, the other troughs (3, 4, 5 and 6) and four other waves (A, B, C and D) are connected not only with cyclic perturbations generated by the echo effect and the declining trend in fertility, but also with the history of regulations concerning abortion. Following a "small baby boon" (wave A, 1949-1955) of only 6 to 7 years subsequent to World War II, a persistent declining trend in fertility began. This produced a birth deficit that was further accentuated with the legislation regarding abortion (in 1955) and then its liberalization (1957) (see trough 3, 1957-1966, in Figure 2). Births decreased year for year for some ten years (from nearly 443 000 in 1957 to 273 000 in

Figure 2
Age structure in Romania at the 2002 census



1966). In 1966, the Romanian government suddenly decided to prohibit abortion, largely practised until then, which obliged many women to bring their pregnancy to completion and provoked a sudden surplus of births the following year (wave B). Until the fall of the socialist regime (in late 1989), the cyclic trend in fertility decline was thwarted, more or less effectively, by pronatalist measures. Among the latter, the enforcement of the law prohibiting abortion, strengthened in 1973 and 1984, created two other, smaller waves (C and D). Generally, this extraordinary parenthesis of 23 years in the demographic transition in Romania finally produced only a slight rise in the birth rate, a population surplus estimated at approximately 2 million inhabitants (Muresan 1966) and a slowing down of ageing, elements that are viewed as positive and desirable by the Romanian government and population. However, at the same time other less positive consequences of a socio-economic or psychological nature were generated by the inability of institutional adaptation (maternity hospitals, schools, housing, labour market, etc.), the frustration of

parents and the birth of a large number of unwanted children, often disturbed and poorly accepted by families and society.

After 1990, another trough (point 6 on the age pyramid) marks a new stage in the "normalization" of behaviours. Abortion was once more liberalized and was gradually included in family planning programmes, prohibited during the pronatalist period. The number of births fell from year to year, with a decline in fertility reaching the level of 1.3 children per woman on average for the short-term indicator. The age structure favourable to the birth rate only had a slight impact on the evolution, with the exception of a low wave (E) between 1997-1999, due exclusively to an inertia effect.

We will consider here other aspects of the age structural transition in Romania. First we will present the specificity of its process of demographic transition. Then, so as to identify the periods of demographic windows, we will view the stages in the age structural transition. The turbulences of the different functional age groups will be followed in their past and future evolutions by referring to policy implications. The last part will consist in an analysis of the links between economic development, in particular the growth of the gross domestic product, and the change in the age structure during the period 1960-2000. This period unquestionably belongs to the second stage in the transition of the age structure, that of "demographic waves" (Pool 2000).

2. Factors and specificity of the demographic transition and age structural transition in Romania

2.1. The stages of demographic transition

The starting point of the demographic transition in Romania and its periodization have been subject to controversy in national and international demographic literature. Even though this is not the main subject of this chapter, it must be said in a few lines that the recent data reduction of the civil register of the historical provinces of Romania has made possible the utilization of statistics that are more comparable than was previously the case, and more reliable than those retained in the international literature. Basing his analysis on the data

representing all the historical provinces constituting the present Romania, in place of those of the former kingdom alone, Ghetau (1997) advanced the hypothesis that mortality began to steadily decline not at the end of the nineteenth century, but towards of the middle of the century. The second phase in demographic transition, that is, the onset of the fertility decline, also began around 35 years earlier (around the mid-1880s rather than 1920) than is indicated in the international literature (Chesnais 1987) or even in the earlier national literature. The dating of the end of this secular process is more complex, not only for the population of Romania, but also for other countries, because on this point the theory shows a weakness and is highly contested. Moreover, as we have seen, Romania presents a strange historical parenthesis, namely the period 1967-1989, marked by a strong legislative intervention in "natural" reproductive behaviour. We will thus leave this problematic to the reading of those who are interested (Muresan 1999a) and examine only the age structural transition.

2.2. The factors: past evolutions and projections

The nature of the process of age structural transition depends on the evolution of the same factors as involved in the demographic transition itself: the nature and speed of the evolution of fertility and of mortality. Figures 3 and 4 show the evolution of the short-term indicator of fertility and the life expectancy at birth for the period 1950-2000, complemented by the values used in the projections until the year 2060. This chapter uses three projection variants of the Romanian population calculated by the author with a specific programme. These variants are hypothetical (scenarios), without claiming to be predictions, either because they prolong the fertility and mortality observed in 2000, or because they consider a recovery, unforeseeable today, of fertility and/or mortality.

The scenario "Recovery 2050" has as basis a hypothesis of gradual recovery of fertility, such that it reaches 1.5 children per woman in the year 2010 and arrives at a value necessary for the replacement of generations in 2050. The level observed in 2000 is 1.3; it has hardly declined since 1997 and is considered as fixed for the period of the scenarios "Constant 2000" and "Double Constant 2000".

Figure 3
Evolution of the short-term indicator of fertility,
observed values and projected values

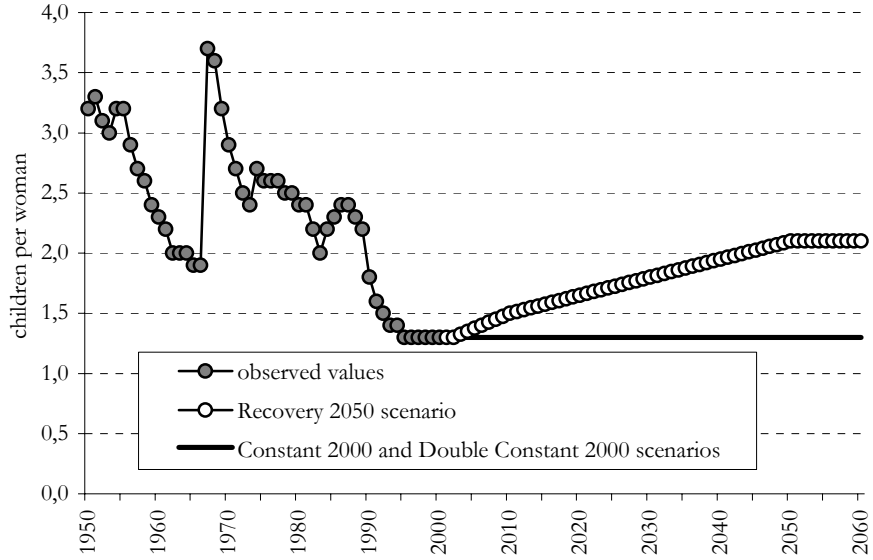
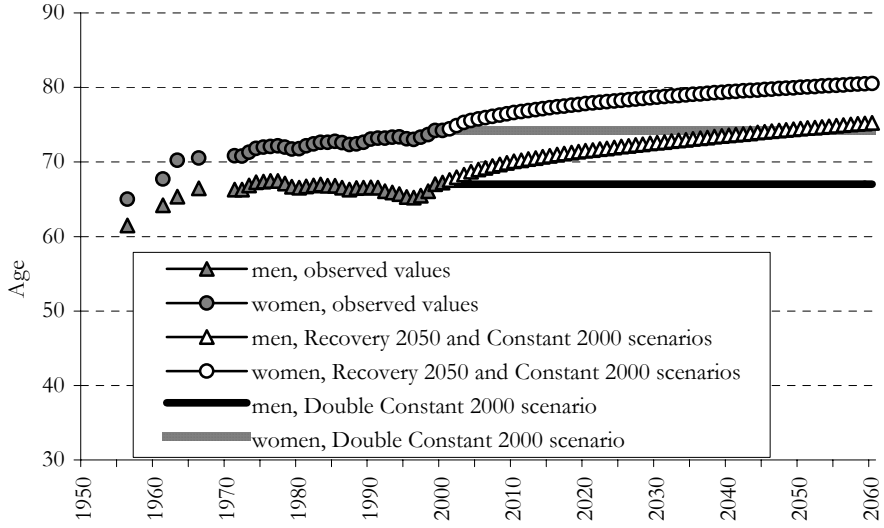


Figure 4
Evolution of life expectancy at birth,
observed values and projected values



For mortality, we have considered a continuous progression of 0.015% annual increase of each perspective probability of survival at each age throughout the entire period of the projection. The last mortality table published by the National Institute of Statistics, which relies on the data from the period 1998-2000, was used as an initial model. Gradually, over time, men will achieve an increase in life expectancy at birth, from 67 years in 2000 to 70 years in 2010 and 74.5 years in 2050. Women, who start with a life expectancy at birth of 74.2 years, should reach 76.6 years in 2010 and 80 years in 2050. Two of our scenarios of demographic projection, "Recovery 2050" and "Constant 2000", use a hypothesis of positive evolution of mortality, while the third, "Double Constant 2000", which only serves as reference, supposes unchanged mortality at the level of 1998-2000.

The strong variations in fertility were, as a general rule, declining when considered on the long term, but with short-term turnarounds subsequent to the prohibition of abortion (3.7 children per woman in 1967 as compared with 1.9 in 1966) or during the years of intensified state control of reproduction, 1974-1980 and 1984-1987. These variations greatly contributed to the disordered birth flows, producing over time unequal entering into and leaving the subpopulations of various functional age groups. Even the evolution of mortality was not very regular. Always declining until the second half of the 1970s, the positive evolutions diminished between 1984 and 1987 and between 1990 and 1996, and they even assumed a negative orientation (recrudescence) for men (Muresan 1999b). After 1997, the positive evolutions were restored.

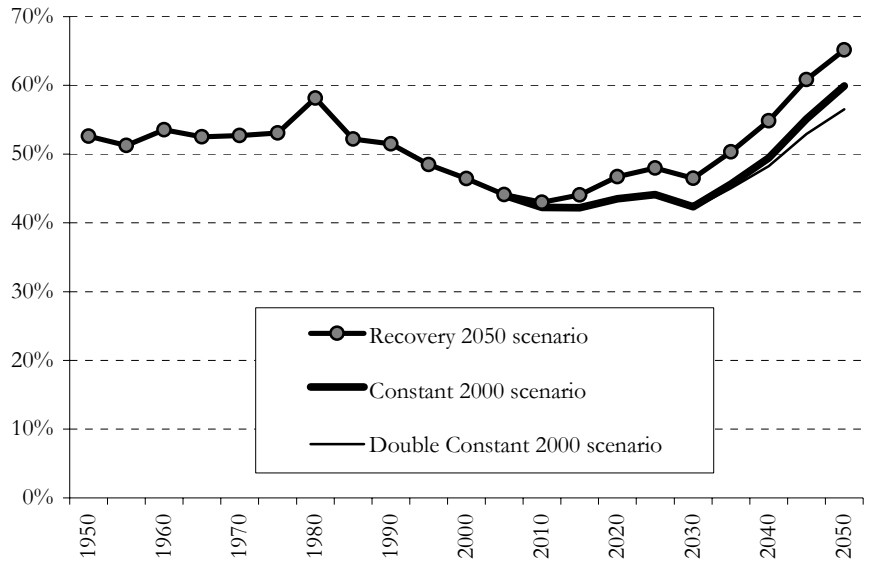
2.3. The stages of age structural transition

While the progression of stages in demographic transition is judged in particular in relation to the natural growth rate, the course of age structural transition is mainly judged according to the evolution of the dependence ratio. The demographic "window of opportunity" is a period in which the series of these ratios has low values or a diminishing pace, between two periods in which the values are higher.

Figure 5 shows the evolution of the dependency ratio (number of young people of 0-14 years and of old people of 65 years and older for 100 persons of 15-64 years). The time horizon of 100 years (1950-2050) allows us to perceive a demographic window between 1995 and

2030 according to the projection variant "Recovery 2050", and still longer (between 1995 and 2045) according to the two other variants, which do not suppose an evolution of rising fertility. The criterion applied here is a value lower than 50% of the dependency ratio. However, the evolution is observed to be not at all steady and gradual, and there are two points of constraint minimum, around 2010 and 2030. This situation results from a very disrupted age structure with disorderly entering and leaving flows, either in surplus or in deficit, in the working age as well as in the non-working age cohorts.

Figure 5
Evolution of the dependency ratio, 1950-2050,
according to the projection variant



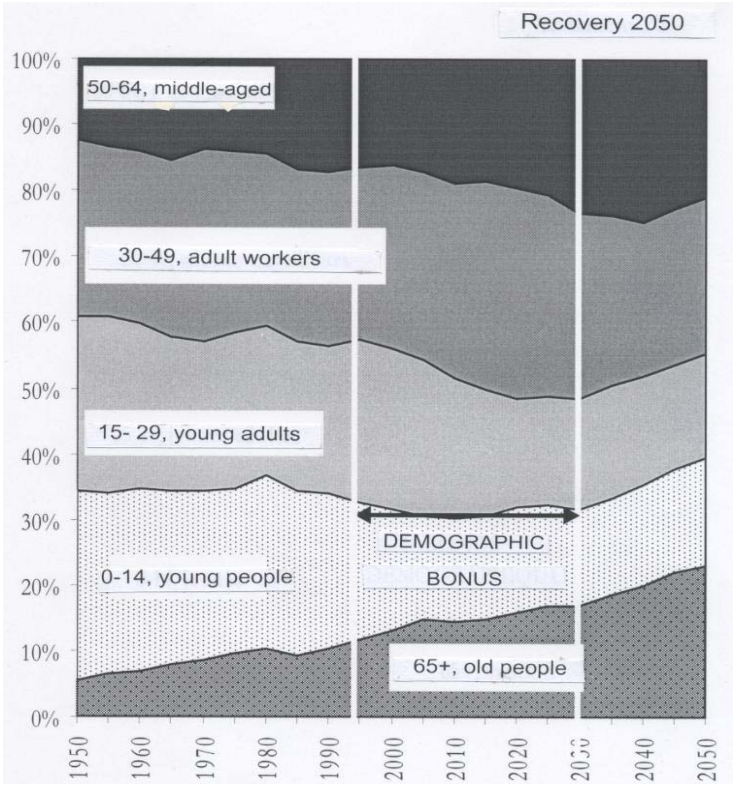
But the demographic window is not confined to only the diminution of the dependency ratio during the passage from a young age structure to an older one, but also includes modifications in the adult age groups, with intrinsic consequences for the labour market and the tax system.

2.4. The life cycle theory

A more detailed analysis of the positive or negative effects in this period is possible by considering, for example, the life style theory, the origin of which goes back to Modigliani. It was used by Lindh and Malmberg (1999), who defined the classification of age structure in accordance with economic behaviours: 0-14 years, young people (*young*); 15-29 years, young adults (*young adulthood*); 30-49 years, adult workers (*prime age*); 50-64 years, middle-aged adults (*middle age*); and 65 years and older, the elderly (*old age*). Thus, the young depend on adults for their consumption, and they are the cause of budgetary expenses for health and education. The young adults are also subject to health and education expenses, but their type of consumption is not the same because their needs are different. They bring about a decreasing average age of the labour force and necessitate investments in human capital. The population of adult workers of 30-49 years work and are therefore productive, but this group consumes its profit to purchase a house or to raise children, without saving very much. The middle-aged adult population earns still more because it profits from accumulated experience and it saves more than the group of 30-49 years. Most of the elderly are retired and they depend on others, in particular as concerns health, but also for their income, which comes from transfers from the active population. This study has shown that the per capita GDP growth rate is closely linked to the age structure. Using the quinquennial data over the period 1950-1990 in the OECD countries, the authors found a strong positive correlation between the weight of the middle-aged population (50-64 years) in the total population and the per capita GDP growth of the following period. They also found a negative correlation between economic growth and the weight of the old population.

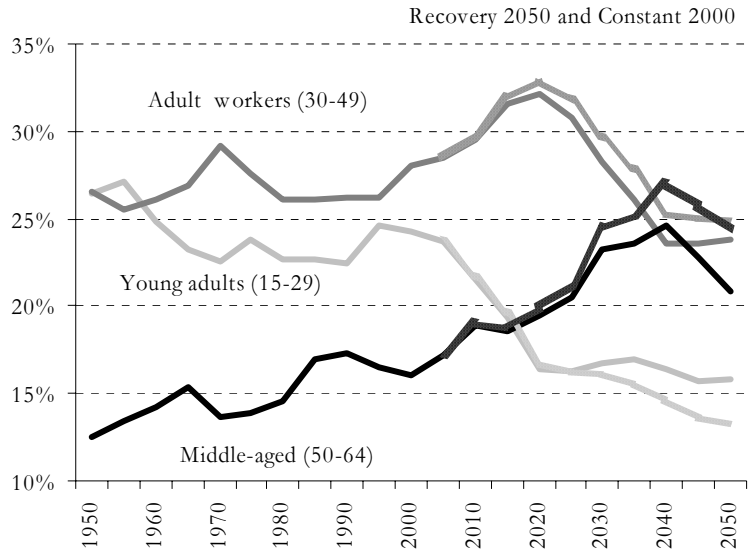
The functional age structural transition for Romania is shown in Figures 6a and 6b.

Figure 6a
Evolution of the functional age structure (all age groups)



The "demographic window of opportunity", determined above, is clearly seen in Figure 6a, as well as the structural growths of the proportions of the old population and the middle-aged population during almost the entire period considered. The question once again arises as to whether this is a bonus or malus period. Do the economic behaviours of the functional age groups move in the same direction as in the OECD countries? If yes, what is the strongest relation: the potentially positive relation induced by the structural growth of the middle-aged population able to make high investments, or the potentially negative relation induced by the increased weight of the old, primarily consuming population?

Figure 6b
Evolution of the functional age structure
(potentially active age groups)



In the group of adult ages there were, and there will be, structural changes (see Figure 6b). The increased weight of the young adults can provide a demographic bonus through the decreasing average age of the labour force and the enrichment of human capital. The increased weight of the adult workers is beneficial to the domain of the tax system because this part of the population is the most likely to work and thus to pay taxes. The growth of the share of middle-aged adults can provide a bonus through investments.

For Romania, the entire period 1950-2050 is marked by these types of changes. The problem is that they are too numerous, repeating themselves with back and forth movements that enormously disturb the ability to plan the concerned public policies. Thus, three periods of decreasing average age of the labour force can be observed (1950-1955, 1975-1980 and 1995-2005), two periods of growth of the population of adult workers (1965-1980 and a longer period 2000-2030) and a nearly continuous growth (with the exception of the years 1970 and 2000) of the middle-aged population.

3. Consequences of age structural transition. Economic and political implications

3.1. The future: new waves, new equilibria

In order to understand the possible long-term changes we will look at the histograms of ages in 2030 and in 2055 (Figures 7 and 8). There one can see the passage of waves already formed to higher ages and the formation of new waves resulting from effects of inertia.

At the end of the 30 years of evolution after the turn of the millennium, a new wave F (formed approximately during the second half of the twenty-first century) can be expected, due mainly to the effect of inertia of wave D. This wave will be smaller if fertility remains at the level of the year 2000, or it falls below that level (in 2001, the TFR was 1.27 children per woman!). After a quarter of a century, a period equal to the interval between the Romanian generations, it can be asked if there is a second new wave. The answer is rather yes in the case of the "Recovery 2050" scenario, and certainly no in the case of the "Constant 2000" scenario. The formation of a new wave can only be considered, from the economic point of view, to begin with as a possible malus, even if, when over the course of time the wave crosses the active ages, it could become a positive factor in development.

The equilibrium between the large age groups will have changed, irrespective of the projection variant. Apparently, in 2030, as in 2002, there will be a period of demographic window because all of the large generations are or will be at a mature age, thus potentially active. They represent 68% of the total population. The bonus would be even larger in the "Constant 2000" scenario because 70% of the total population would be of working age. However, an initial difference consists in the weight of the young people and that of the old. In 2002, the young represented 18% of the total population and the old 14%. In 2030, the equilibrium will have reversed: 15% for the young and 17% for the old. This holds for the variant that considers the recovery of fertility. According to the other variant, the difference between the respective weights of the young and the old is yet larger: 12% for the young and 18% for the old. A second difference consists in the internal composition of the adult age groups. In 2002, the large generations are in the initial phase of adult age, whereas in 2030, they approach old age, while remaining in the active age groups. Economically, according to the life

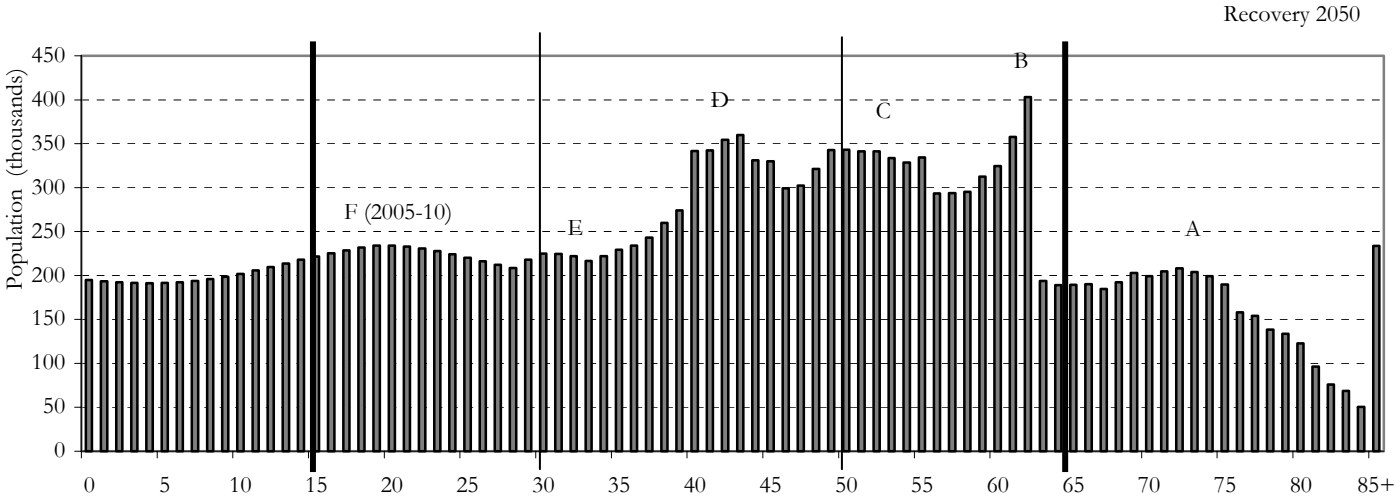
cycle theory, the years 2002 and 2030 can benefit demographic bonuses, but are different in nature and in social costs because, in the first period, the formation of human capital requires specific investments in young adults at the beginning of their active life, whereas in 2030, this will be a bonus without costs (if retirement before the legally foreseen age is not a mass phenomenon) because the numerous middle-aged adults (50-64 years) will have less expenses and will be able to invest and save.

After a quarter of a century, in 2055, the large generations will all be at old age, that is, over 65 years. But this demographic malus for the population as a whole is all the greater when the earlier bonus was large: 30% of the old people according to the "Constant 2000" variant, as opposed to only 25% according to the "Recovery 2050" variant, will be in this category, which is very substantial in terms of budgetary needs.

As regards problems in the nearer future, let us look at the situation for the year 2015 (Figure 9).

This would appear to be a very favourable year from the demographic point of view. Adults are relatively numerous (nearly 70%), the weight of the young population is in equilibrium with the old population (each group representing about 15% of the population), the young adults are mature, potentially already bearers of a high human capital, and the middle-aged adults are numerous. The only demographic problem could consist in the presence of numerous turbulences, implying the augmenting potentiality of punctual malfunctioning of services and the fear of substantial changes in the near future.

Figure 7
Population (thousands) by age in 2030, according to the projected scenario



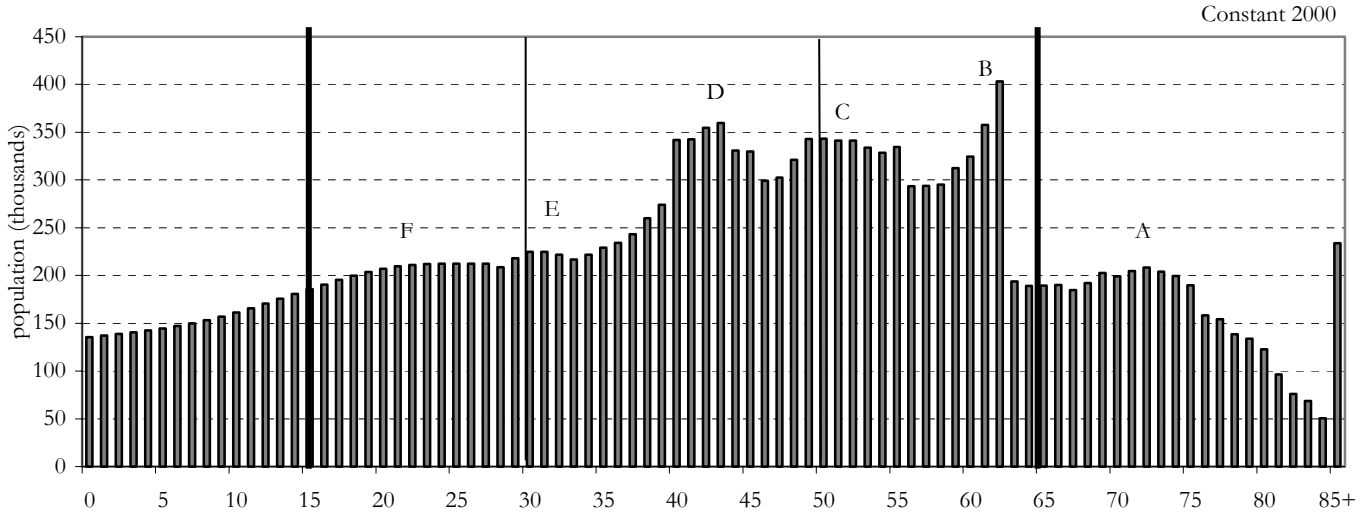
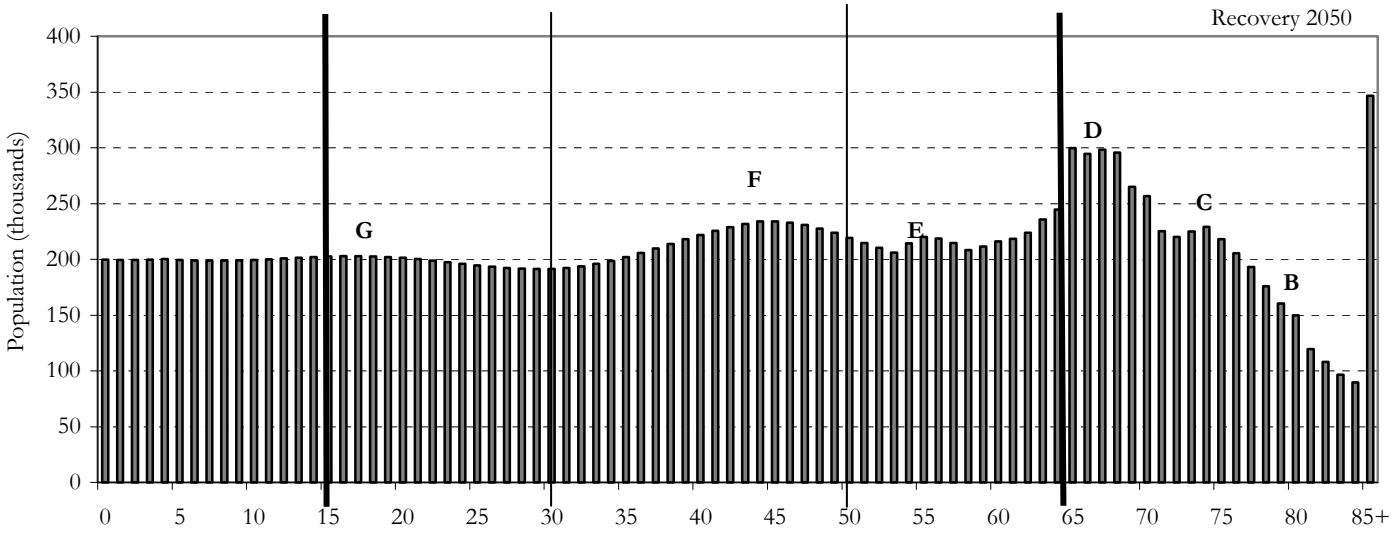

Constant 2000
population (thousands)
450
400
350
300
250
200
150
100
50
0
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85+
A
B
C
D
E
F

Figure 8
Population (thousands) by age in 2055, according to the projected scenario



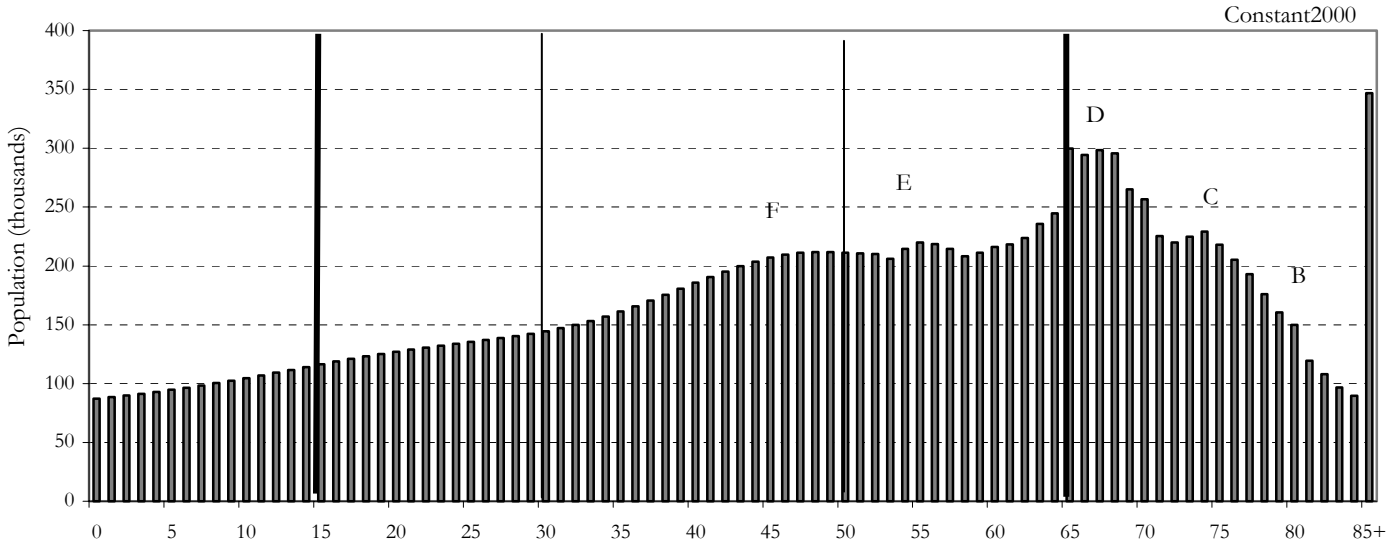
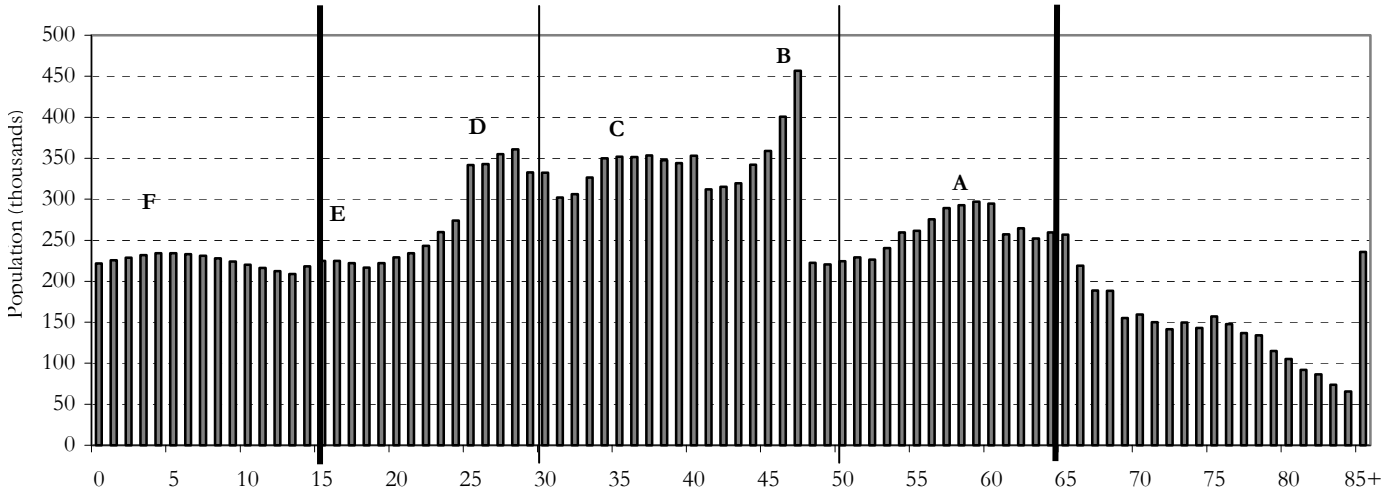

Constant2000
Population (thousands)
400
350
300
250
200
150
100
50
0
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85+
B
C
D
E
F

Figure 9
Population (thousands) by age in 2015, according to the scenario "Recovery 2050"



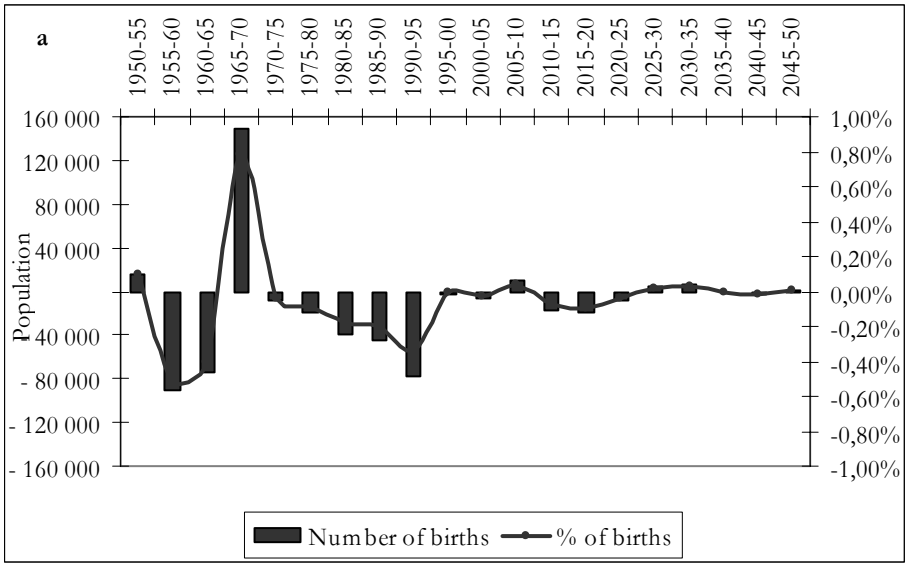
3.2. Past and future turbulences for all functional age groups

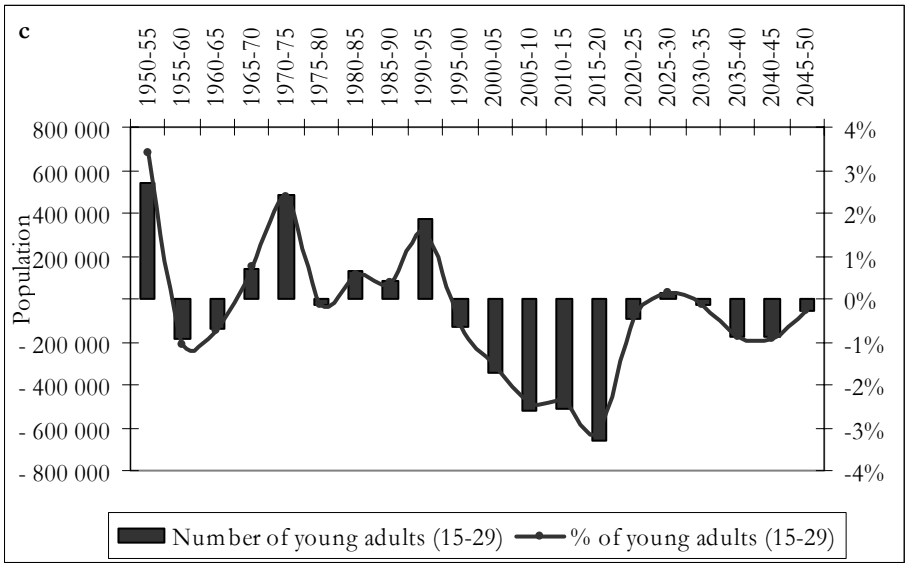
Past turbulences and their demographic consequences, future waves and turbulences, can be followed, not only on the pyramids of the various years of the schedule, but by observing them according to functional age groups evolving on a quinquennial time scale. The series of Figures 10a – f shows the absolute and relative growths of various subpopulations: infants, the young, young adults, working adults, the middle-aged and the elderly populations. The changes in the period 2010-2015, of great importance for the Millennium Development Goals, are indicated in a lighter colour. It is very easy to observe the fluctuating forms of increases and decreases in numbers. This series of diagrams uses only the scenario of the "Recovery 2050" projection, but, as is already known, the turbulences will not disappear according to the other variants, even if their magnitude can decrease.

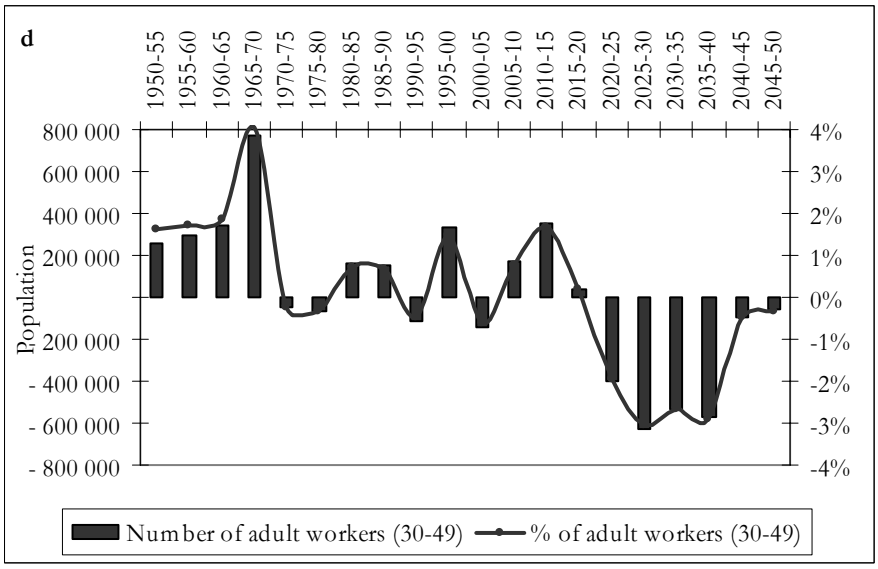
The population in Romania continues to decline (since 1990) throughout the period of projection but, in addition to this, let us see what changes take place more particularly around the year 2015. Between 2010 and 2015:

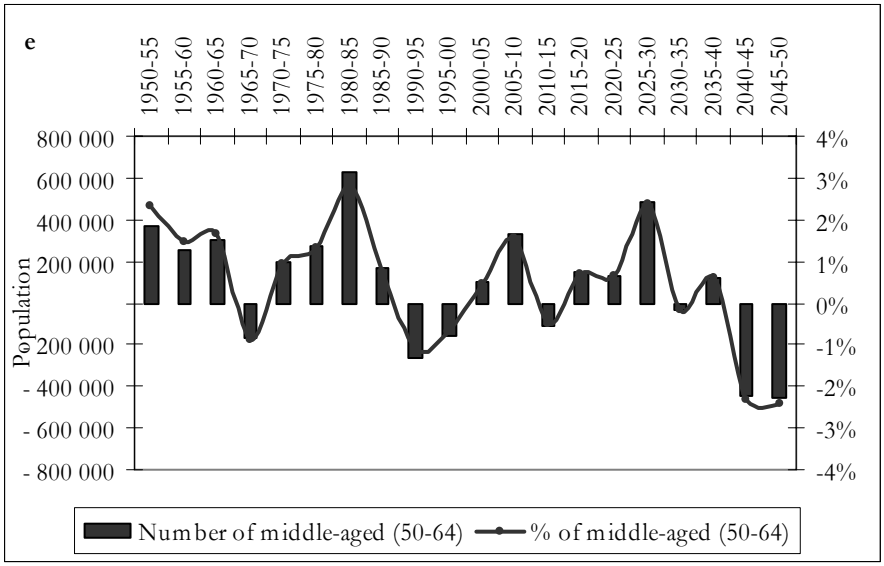
- the number of births will begin to decline, from more than 230 000 to roughly 220 000 (Figure 10a);
- the massive numerical decline of the young (0-14 years) will temporarily come to a halt, with a resumption in 2020 (Figure 10b);
- the number of young adults (15-29 years) will continue its massive decline, with still a half million individuals, representing 2.4% of the total population (Figure 10c);
- the number of adult workers will increase to 350 000 (1.7% of the total population), an evolution between two periods in which their number diminishes, 2000-2005 and 2020-2040 (Figure 10d);
- the number of middle-aged adults (50-64 years) will undergo a temporary decline, after having increased between 2005 and 2010, and before another period of increase between 2015 and 2030 (Figure 10e);
- the number of old people will increase at a more or less accelerated rate, with a stagnation around the year 2015 (Figure 10f).

Figure 10a-f
Growths in numbers and impact of cohort flows
on the functional age groups in percentage
of the total population at the beginning of the quinquennial period




c
1950-55
1955-60
1960-65
1965-70
1970-75
1975-80
1980-85
1985-90
1990-95
1995-00
2000-05
2005-10
2010-15
2015-20
2020-25
2025-30
2030-35
2035-40
2040-45
2045-50
800 000
600 000
400 000
200 000
- 200 000
- 400 000
- 600 000
- 800 000
Population
4%
3%
2%
1%
0%
-1%
-2%
-3%
-4%
Number of young adults (15-29)
% of young adults (15-29)


d
1950-55
1955-60
1960-65
1965-70
1970-75
1975-80
1980-85
1985-90
1990-95
1995-00
2000-05
2005-10
2010-15
2015-20
2020-25
2025-30
2030-35
2035-40
2040-45
2045-50
800 000
600 000
400 000
200 000
200 000
- 400 000
- 600 000
- 800 000
Population
4%
3%
2%
1%
0%
-1%
-2%
-3%
-4%
Number of adult workers (30-49)
% of adult workers (30-49)


e
1950-55
1955-60
1960-65
1965-70
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1980-85
1985-90
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1995-00
2000-05
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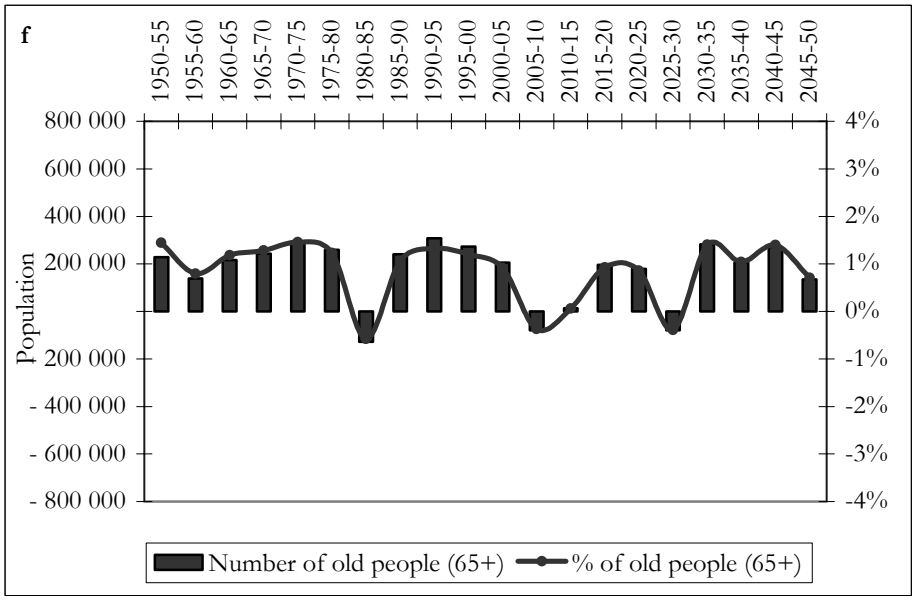
2010-15
2015-20
2020-25
2025-30
2030-35
2035-40
2040-45
2045-50
800 000
600 000
400 000
200 000
200 000
- 400 000
- 600 000
- 800 000
4%
3%
2%
1%
0%
-1%
-2%
-3%
-4%
Population
Number of middle-aged (50-64)
% of middle-aged (50-64)


f
1950-55
1955-60
1960-65
1965-70
1970-75
1975-80
1980-85
1985-90
1990-95
1995-00
2000-05
2005-10
2010-15
2015-20
2020-25
2025-30
2030-35
2035-40
2040-45
2045-50
800 000
600 000
400 000
200 000
200 000
- 400 000
- 600 000
- 800 000
4%
3%
2%
1%
0%
-1%
-2%
-3%
-4%
Population
Number of old people (65+)
% of old people (65+)

3.3. Relations between the evolution of the sizes of functional age groups and economic development, 1960-2000

We will present at the end of this chapter the results of a statistical analysis examining the relations between population and development. We have used the annual series in percentage according to functional age-group structures between 1960 and 2000 (National Institute of Statistics) and the corresponding series of data on economic development (Heston *et al.* 2002). The economic variables used are the per capita gross domestic product and its components: shares of consumption, of public consumption expenditure and of investment.

The analysis of the macro-economic indicators shows that the period 1960-2000 was a period of economic bonus (continuous growth of GDP). The evolution of the main development indicator shows that the most advantageous period for the economy was before 1985, when the growth rate was situated between 8% and 16% (Table 1). This period coincides with the period of population growth, while the period of demographic decline (after 1990) coincides with a slowing down of GDP growth (only 1% annually) and, of course, with the period of transition from an entirely planned socialist economy to a market economy. If we consider the components of development, the evolution of consumption indicates that its share diminished until the beginning of the 1980s and subsequently resumed an upward trend, whereas the growth rate of public consumption expenditure followed an opposite evolution. The most advantageous period for investment seems to be the last, 1990-2000, marked by a strong fertility decline.

This rough macro-economic analysis tells us nothing regarding the influence of age structure and its transition. Without professing a very adequate analysis, let us look at the statistical correlations (Table 2). Contrary to the results arrived at by Lindh and Malmberg (1999), economic development is not positively associated with the share of the middle-aged population at the beginning of the period, but very negatively (-0.701), as for that matter the share of old people (-0.432). The two values are statistically significant at the level of confidence $p<0.01$, but the latter association is very weak. Two other paradoxical

Table 1
Annual evolution of economic indicators, 1960-2000

Period	Annual per capita GDP growth rate (%)	Average annual percentage of consumption	Average annual percentage of public consumption expenditure	Average annual percentage of investment
1960-1965	9	65	29	7
1965-1970	11	59	33	9
1970-1975	16	57	35	9
1975-1980	12	56	38	8
1980-1985	8	59	30	9
1985-1990	3	65	22	8
1990-1995	1	74	17	14
1995-2000	1	82	11	14

Tableau 2
Correlation and regression coefficients of functional age structure with annual GDP growth rates

Determinants of economic growth	Pearson correlation coefficients (with GDP growth)	Standardized regression coefficients (dependent variable: GDP growth)
Young 0-14	0.461 **	pas incluse
Young adults 15-29	- 0.052	0.189
Adult workers 30-49	0.456 **	- 0.061
Middle age 50-64	- 0.701 **	- 0.671 *
Old 65+	- 0.432 **	- 0.256
Consumption (%)	-0.629 **	-1.205 **
Public expenditure (%)	-0.387**	0.324
Investment (%)	0.638 **	- 0.809

** $p<0,01$; * $p<0,05$. $R^2 = 0,660$.

Associations that are somewhat significant are those of the share of young people (0-14 years) and the share of adult workers (30-49 years). According to the life cycle theory, the latter are consumers rather than investors, and thus they would not favour economic development. The correlations showing the contrary are weak. For this reason we have

carried out another statistical analysis that accounts for all the factors at the same time and we have added as control variables the shares in percentage of the GDP components.

The new coefficients obtained show that, all other things remaining the same, the only percentage that counts is the share of the population of 50-64 years. But the negative orientation remains (-0.671). Rather than its weight contributing to economic development, it checked this development. This is the share of consumption in the GDP which counted most in economic development (-1.205, significant at the threshold of $p<0.01$). The other age groups did not contribute significantly in the regression regarding economic growth. The only explanation we found for this situation is that the Romanian economy is rather an economy of consumption, and all the other possible motives are still too weak in the actual period of transition. Or, perhaps the numerous disparities of sizes of diverse ages, on the upper and lower ends, and their irregularities – that is, the turbulences – impeded the economy from developing steadily or in accordance with the theory?

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