EGYPT LABOUR MARKET REPORT

DEMOGRAPHIC TRENDS, LABOUR MARKET EVOLUTION AND SCENARIOS FOR THE PERIOD 2015–2030

Central Agency for Public Mobilization and Statistics
(CAPMAS)

International Organization for Migration (IOM)
The UN Migration Agency

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This report has been prepared by Professor Michele Bruni, and the Migration Data Analysis Unit of the Central Agency for Public Mobilization and Statistics (CAPMAS), with the support of IOM Country Office in Egypt, in the framework of the Developing Capacities for Forecasting and Planning Migration across the Mediterranean project funded by the IOM Development Fund (IDF).

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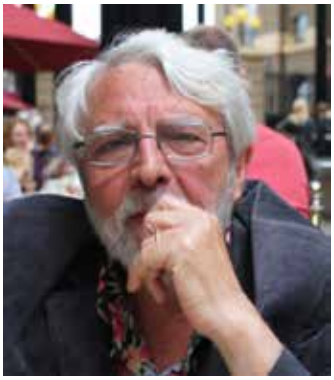
About the author



Michele Bruni's research has focused on the development of stock and flow models and their application to the analysis of labour market, migration, and more recently to the definition of a model to assess future labour needs and immigration flows and a new procedure to build demographic projections based on these estimates.

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Table of contents

List of graphs

List of tables

List of acronyms

AD	Additional demand
CAPMAS	Central Agency for Public Mobilization and Statistic
CBR	Crude birth rate
CDR	Crude death rate
CHMR	Child mortality rate
CMR	Crude mortality rate
GDP	Gross domestic product
IT	Information technology
LEB	Life expectancy at birth
LF	Labour force
RoA	Rate of activity
RoE	Rate of employment
RoU	Rate of unemployment
RoAF	Rate of activity in terms of flow
RoEF	Rate of employment in terms of flow
RoUF	Rate of unemployment in terms of flow
SEL	Structural excess of labour
SSL	Structural shortage of labour
TFR	Total fertility rate
UN DESA	United Nations Department of Economic and Social Affairs Population Division
WAP	Working age population

Objectives and structure of the paper

An unprecedented demographic revolution is affecting the planet. It will not only lead both working age population (WAP) and total population to their historical maximum, but will also open the way, probably before the end of the century, to a new historical period of demographic decline. Moreover, world population has entered a long phase of ageing and, even more worrying, of unprecedented international demographic polarization.

What is already being witnessed – and will become one of the most relevant features of this century – is the co-presence of countries whose total population and, more importantly, whose WAP are declining and other countries whose total population and WAP are exploding as a result of the demographic transition. The demographic transitions is a process that by now is affecting all the countries in the world and brings a population from a traditional regime, characterized by high rates of fertility and mortality, to a modern regime, characterized by low fertility and low mortality. The demographic transition has started in different countries in different moments of time. In some, it was already underway at the beginning of the nineteenth century; in others, it began after World War II; in the poorest countries of the world, it is starting now. Moreover, the speed of the demographic transition has been and is different in the various countries affected by the phenomenon depending on their values, religious beliefs and institutional settings.

The countries of the northern shore of the Mediterranean – and more generally the European countries – are already in the last phase of the demographic transition and therefore characterized by a declining WAP; those of the southern shore belong to the group of countries still in the middle phase of the transition and are characterized by an increasing WAP. The situation is made even more complex by the fact that the two groups of countries not only have a different demographic context, but also different levels of economic development, different religions and cultures. Egypt is the most populous country of the southern shore of the Mediterranean and still has the most pronounced level of demographic growth.

The general objective of the paper is to provide strong statistical evidence that in Egypt for at least 30 years – but probably for an even longer period – the rate of economic growth requested to absorb the generations that will exit the education and vocational training system is not attainable, and migration out of the country will be necessary to avoid an unsustainable level of poverty and unemployment, and all the socioeconomic consequences that would derive from such a situation. At the same time, an increasing number of countries in Europe, Asia, North America and South America will be characterized by an increasing structural shortage of labour supply that for its nature and dimension cannot be solved by market mechanisms, by active labour policies, or by presidential decrees. The conclusion is that Egypt (as well as other developing countries) and European Union countries have a common interest to join forces, although for differing motives, in coorganizing and co-managing migration flows, in the amount and typology needed. This would represent the most effective antidote to irregular migration flows pulled by the correct perception that the destination countries need foreign labour.

The paper is structured into three parts. The first part presents the evolution of the main Egyptian demographic variables and indicators since 1950 and the forecasts produced by the Population Division of the United Nations for the remaining part of the century. It does also contain a section presenting a short history of Egyptian migration, the available evidence on the trends of Egyptian migration flows and the present distribution of the stock of Egyptian migrants over the world.

The second section is devoted to a detailed analysis of the Egyptian labour market based on the results of the Labour Force Survey. The analysis – that covers mostly the 2010–2015 period – relies on two complementary approaches: the first is the standard approach in terms of stock, the second is the generational flow approach, the latter being more apt to understand the labour market dynamics and its connection to migration flows. The section will be concluded by a series

of policy suggestions based on the empirical evidence that has emerged from the previous analysis. The main conclusion is that even in the most favourable scenario, Egypt will be affected by a structural excess of labour supply that not only will cause unprecedented levels of unemployment, but could also jeopardize Egypt's social stability.

Therefore, the third and final part of the paper will be devoted to the presentation of labour market and demographic scenarios for Egypt and a select group of European Union countries for the period 2015–2030. The scenarios are very reliable from a demographic perspective since the young people that will become 15, and enter WAP over this time interval, are already born. For what relates to Egypt, the goal is to provide estimates of the structural excess of labour that will characterize the Egyptian labour market in the next 15 years in alternative hypotheses of employment growth, labour market participation and migration flows. At the same time, the scenarios for the European Union countries will document the structural shortage of labour supply that will affect these countries in the same period also in alternative hypotheses of employment growth, labour market participation and immigration flows. In both cases, the estimates will be presented by educational level.

Some conclusive remarks summarizing the main findings of the paper will be the premise for a series of policy suggestions ranging from demography, to education, to economic development and industrial structure. However, it will be argued that while the Government of Egypt should strive to implement all the measures suggested, as well as any other measure that could help in solving the employment problems of the country in an efficient and coordinated way, mass emigration will remain a necessity if the country wants to avoid poverty and social unrest.

This goal should be facilitated by the fact that European Union countries, and also other countries including the Arab countries of the Gulf, will have a parallel need of mass immigration. The paper will therefore argue that it would be in the common interest of Egypt and potential arrival countries to organize migration flows responding to their complementary needs and suggest a possible methodological approach to do so. What stands in the way, especially in this historical phase, is an ideological and irrational refusal of many developed countries to recognize that they have a structural shortage of labour that can be solved only by immigration, and that in its absence, they will not be able to continue along a path of economic growth and social development. The hope is that the ideas put forward in this paper, together with the empirical findings on which they stand, will facilitate a political agreement in this direction.

Executive summary

The demographic transition is currently affecting all countries of the world. It will bring both the working age population (WAP) and the total population of the world to their historical maximum, probably before the end of the century, while causing an unprecedented ageing process.

The demographic transition started in different countries at different moments of time. In some, it was already on its way at the beginning of the nineteenth century, while in others, it began after World War II. As for the poorest countries of the world, it is just taking off. As a result, the world is witnessing the co-presence of countries whose WAP is declining and countries whose WAP is exploding. This situation will become more and more pronounced and will impose itself, together with ageing, as one of the most relevant demographic features of the twenty-first century.

One obvious implication is that the countries of the first group are extremely likely to be affected by an increasing structural shortage of labour, while those of the second group by an increasing structural excess of labour. In this situation, the growth of the employment level registered by the more developed countries from 1950 to 2015 has fuelled the increase in international migration from 1 to 6 million per year, and caused relevant changes in their direction.

The countries in the northern shore of the Mediterranean – more generally, the European countries – belong to the first group and are already characterized by a declining WAP. Meanwhile, those in the southern shore belong to the second group and their WAP is increasing. Both trends are extremely relevant and will become more and more pronounced. The geopolitical situation of the region is made more complex by the fact that the two groups of countries present a different level of economic development, as well as different religions and cultures. A dramatic outcome of this situation is the lack of the capacity to manage the flows of migrants and refugees (who are also looking for jobs) trying to cross the Mediterranean or reach Europe along the Balkan or Spain routes.

The main objective of this study is to provide statistical evidence that in Egypt, for at least 30 years or even for a longer period, the rate of economic growth requested to absorb the generations exiting educational systems is not attainable; and migration out of the country will be necessary to avoid an unsustainable level of poverty, unemployment, as well as other undesired socioeconomic consequences. At the same time, an increasing number of countries in Europe, Asia, North and South America will be characterized by an increasing structural shortage of labour supply that, for its nature and dimension, cannot be solved by market mechanisms, active labour policies, nor presidential decrees. Therefore, Egypt (as well as other developing countries) and European Union countries have a common interest to join forces in better organizing and managing migration across the Mediterranean.

The first two parts of the study are devoted to Egypt, the largest country of the southern shore of the Mediterranean. The first presents the evolution of the main demographic variables and indicators since 1950, in addition to the forecasts of the Population Division of the United Nations (UN DESA) for the remainder of the twenty-first century. It also briefly summarizes the history of Egyptian migration and presents the available evidence on the distribution of Egyptian migrants around the world. The second section is devoted to a detailed analysis of the Egyptian labour market based on the results of the Labour Force Survey. The analysis, which mostly covers the 2010–2015 period, relies on two complementary approaches: the standard approach in terms of stock, as well as a generational flow approach better suited to analyse the connections between the labour market dynamics and the structural excess of labour. A series of policy suggestions based on the empirical evidence emerged from the previous analysis completes the section.

The third part of the paper is devoted to labour market and demographic scenarios for Egypt and four European Union countries (France, Germany, Italy and the United Kingdom). The scenarios cover the period 2015–2030 and are based on alternative hypotheses of employment growth and labour market participation. They aim to estimate the structural excess of labour that will characterize the Egyptian labour market, as well as the structural shortage of labour that will affect the four European Union countries. In both cases, the estimates are presented by three main educational levels.

The final part of the paper summarizes the evidence on the demographic polarization of the northern and southern shores of the Mediterranean and its impact on the respective labour markets. It then proposes a rational way of managing the migration flows that will inevitably move from one shore to the other. These flows are fuelled by the structural lack of labour that will affect the European region in the presence of the large and increasing structural excess of labour in the countries of the southern shore.

PART I
MAIN FINDINGS OF THE STUDY

Demographic trends in Egypt

Since the middle of the twentieth century, Egypt has witnessed a dramatic demographic explosion that has brought its population from 20.9 million in 1950 to 91.5 million in 2015. In a zero-migration scenario, the Egyptian population is forecast to exceed 200 million by 2100.

Since 1950, the main demographic indicators of the Egyptian labour market have undergone a notable evolution; the total fertility rate has decreased from 6.6 to 3.4 children per woman, and life expectancy at birth has increased from 41.1 to 70.8 years, also due to the dramatic decline of the child mortality rate from 387 to 24.2 per thousand. However, the number of births has progressively grown, reaching a present value of around 2.5 million, and it is expected to remain above this value until 2080. Therefore, despite the increase in the number of deaths caused by the ongoing ageing progress, the total population of Egypt will continue to expand by more than 1.5 million people every year until the end of the century.

The growth in population has been paralleled by a dramatic change in age structure. The percentage of young people reached a maximum of 41 per cent in 1990, and then progressively declined to a present value of 33.2 per cent.

However, it is projected to remain at 17.2 per cent at the end of the century, while the number of young people will continue to increase for most of it. At the other side of the age ladder, the number of people aged 65 and more has increased sevenfold from 1950 until now. The ageing process is forecast to intensify in the next 85 years; old people are expected to represent 21.6 per cent of the total population in 2100 (45 million), outnumbering children (36 million).

Despite the lack of reliable data and the presence of very different estimates, there is no doubt that emigration has been a constant feature of Egyptian socioeconomic history. It underwent different phases originating from changing international conditions, the need for labour force in the Arab regions, and different economic factors and policy decisions at the national level, all of which are identified as part of the analysis.

In the 1960s, it was already evident that the Egyptian economy could not provide the number of jobs necessary to satisfy the growth in labour supply due to demographic trends. Since 1971, the Government of Egypt has authorized both temporary and permanent migration. Following the increase in the price of oil and its impact on economic growth, the following years registered a very relevant expansion in the demand of foreign labour by Arab countries. As a result, this caused the Government of Egypt to further ease migration procedures and create the Ministry of State for Emigration Affairs in 1981, drawing up an overall migration strategy.

All sources agree that the number of Egyptians living and working abroad greatly increased throughout the following decades, and that the main destination of Egyptian migrants is represented by Arab countries. However, the estimated number of Egyptians living abroad largely differs from one source to the other.

According to the United Nations, 3.27 million Egyptians were living abroad in 2015, which is 2.5 times more than in 1990. The registered Egyptians abroad are extremely concentrated, with 87 per cent in Arab countries, 6.7 per cent in Europe and 5.3 per cent in North America. Those who are not registered have a similar distribution, but a lower level of concentration.

It has to be underlined that the migration to Gulf countries have always been characterized by temporary work contracts without any perspective of a permanent stay or obtaining citizen privileges, while the migration to Europe, North America and Australia are motivated by the hope of a permanent stay.

PART II
EGYPTIAN LABOUR MARKET TRENDS AND CHARACTERISTICS: THE PERIOD 2010–2015

Stock analysis

Between 2010 and 2015, the performance of the Egyptian labour market has been largely insufficient relative to demographic growth. In fact, while the WAP increased at a rate of 3.1 per cent per year, employment increased by only 0.9 per cent, which is half of the growth registered by the labour force. As a consequence, unemployment grew more than employment, the average yearly rates being 260,000 and 200,000.

The Egyptian WAP is not only very young, but its average age has been declining due to the entrance of young generations that are larger in size.

The previous trends are well captured by the changes of the main stock and flow labour market indicators.

The rate of employment (RoE) plunged from an already very low 47.2 per cent to 42.6 per cent, while the rate of unemployment (RoU) increased from 9.1 per cent to 13 per cent. While registering some modest improvement, the presence of women in the labour market remained marginal and very weak, more than double that of men.

As is the case with all economies in which men have the social role of the main breadwinners, the men-specific employment rates in Egypt are characterized by values above 90 per cent for the age groups between 30 and 55. In this socioeconomic context, men not only have the duty to work, but also enjoy social priority in getting the available (and "socially suitable") jobs. Additionally, men with family have priority over younger, unmarried men. Coherently, the relative lack of labour demand registered in the Egyptian labour market between 2010 and 2015 has primarily affected the men in the first age groups.

The situation of women is quite different. In 2010, their age-specific rates of employment progressively increased up to the age of 50, to then rapidly decline. Between 2010 and 2015, the rates of employment of the first three age groups increased, while those of all the age groups above 29 declined, the maximum contraction registered by the 45–49 age group. As a consequence, women-specific rates of employment also present a box shape in 2015, but with maximum values below 25 per cent.

However, this very clear trend is the result of a complex set of opposite tendencies. On the one hand, all male rates have increased, and the maximum change has been registered by the 20–24 age group. The unemployment rate of this group has more than doubled, reaching a record value of 31.7 per cent. On the other hand, female rates have declined in the 25–29 age group. Therefore, while the female rates for these age groups remain higher than those of male, the gender differential has notably declined. Moreover, the rates of the older age groups have increased and, in this case, the most affected has been the 35–39 age group. Data seem to suggest a convergence of male and female rates for the first age groups and the opposite phenomenon for the central age groups.

Flow analysis: Generational entries and exits by sex and age group

The analysis of the generational flows shows that during every year between 2010 and 2015, more than 2.4 million young people entered the WAP and 1.1 million entered the labour force on an annual basis. Only around 800,000 succeeded in finding a job, and as much as 75 per cent of these entries were fostered by definitive exits from employment due to retirement, death or migration. The main age group of entry is the 20–24, representing 52.5 per cent of labour force and 40.7 per cent of employment.

Generational exits from both labour force and employment start in correspondence with the 30–34 age bracket. As to be expected, the majority of exits from the labour force take place starting the age of 60, and account for almost 50 per cent of the total. However, a little more than 20 per cent of the generational exits took place in the 30–34 age group and 15 per cent in the following two age groups. The latter could be the result of discouragement, but is most probably due to emigration.

The economic sectors

The analysis in terms of stock. The increase in employment by almost 1 million was the result of a decline in agriculture (-4.2%) and industry (-4.2%), and an increase in construction (+11.7%) and services (+ 10.0%). Thus, in 2015, 49.4 per cent of the employed worked in the service sector, 25.2 per cent in agriculture, 13.1 per cent in industry, and 12.3 per cent in construction.

Women's employment grew in all four sectors, particularly the service sector (+ 14.9%) where it was overall more than men's employment (9.3% versus 3.0%). Their employment remains concentrated in agriculture and services, which respectively account for 40.1 and 54.2 per cent of total female employment.

On the other hand, employment declined in all industrial branches, except for water supply. The decline was quite large in mining and electricity.

In conclusion, the positive trend in the employment level of the service sector was due to traditional sectors, modern sectors like information technology, financial activities and professional and administrative professions registering negative or marginal increases. Women are concentrated in few branches: 39 per cent work in education and 16.5 per cent in health, followed by trade (15.8%) and public administration (15%).

Between 2010 and 2015, the performance of the Egyptian labour market was not only insufficient in quantitative terms, but also showed a lack of dynamism in the two main productive sectors (agriculture and manufacturing), as well as a negative performance in modern service sectors that represent a prerequisite to increase productivity and competitiveness.

The analysis in terms of flows. It was the services sector that contributed significantly to absorbing the new entrants into employment (51.1%), followed by agriculture (27.9%), construction (12.8%) and industry, with only 8.2 per cent. The share of women in total entries was just below one third. Agriculture absorbed 265,000 young workers every year (around 28% of total entries). Generational entries were fewer than generational exits, and therefore total employment declined. However, while this was true for men, it was not true for women. A similar situation characterized the industry sector with women registering a positive additional demand. In the services and construction sectors, replacement demand played a more important role for men than for women. The main branches of transportation and trade, with shares of 11.4 per cent and 10.6 per cent, played a more important role than manufacturing, which had a share of 6.7 per cent and preceded education and health.

Women found employment mainly in agriculture and services, which respectively accounted for 53.4 per cent and 41.8 per cent of women's entries. At a lower level of aggregation, education (11%), health (9.5%) and trade (8.1%) are the branches of the services sector that have the highest share of women's entries. In the case of men, 55.5 per cent of entries were accounted for by services, 18.8 per cent by construction, 15.6 per cent by agriculture and 10.1 per cent by industry.

The educational level

The analysis in terms of stock. As a consequence of the present position of Egypt along the path of the demographic transition, the population members in the compulsory education age are increasing at a very fast rate, as well as the number of potential high school and higher education students. Therefore, it is not surprising that the educational level of the Egyptian WAP is quite low and that improvements in recent years have been quite modest.

If the main labour market variables are considered, the most positive signs are represented by the drastic decline in the number of illiterates and the increase in the educational level of the young generations, especially women.

Given the positive relationship between education and participation in the formal labour market and the relative lack of high technological cluster, WAP has the lowest average educational level and highest unemployment, with labour force and employment presenting intermediate values.

In 2015, only 15.2 per cent of the WAP had a high educational level, while 32.7 per cent had an intermediate education, and more than half only had compulsory education (or less). With respect to 2010, the situation had not changed notably; only the percentage of people with intermediate education registered a small increase. However, a positive indication for the future can be derived from the fact that the percentage of illiterates in the 15–19 age group declined from 13.7 per cent to 8.7 per cent between 2010 and 2015. The educational attainment of women was lower than that of men, but their educational level increased more between 2010 and 2015.

The previous data already suggest that the members of the labour force had a higher educational level than the employed, with the share of the employed with less than intermediate education equal to 44.5 per cent vs. 41.1 per cent of the members of the labour force.

Finally, the distribution of women is observed in the labour force and in employment by educational level presents a higher level of polarization, with women being over-represented between the illiterate and the people with higher education being under-represented between those with intermediate and below intermediate education.

The main economic indicators by educational level. Numerous labour market studies have shown that the presence in the labour market is positively related to educational attainment. At first glance, Egypt is no exception. In 2015, the RoE was equal to 34.9 per cent for people with low education, 43.7 per cent for people with intermediate education, and 61.4 per cent for people with high education. A similar trend characterized the activity rates, the difference in the rates of employment increasing with the educational level. A partial exception to this perfect progression is the RoE of the illiterates, which was equal to 38.5 per cent. This exception assumes a special relevance when the sex-specific rates are considered, since – in the case of men – the highest RoE is in fact registered by the illiterate with values above 86 per cent, both in 2010 and 2015.

It is observed that between 2010 and 2015, all specific rates of activity (RoA) and rates of employment declined, the maximum change being registered by the illiterate and by those with intermediate education.

The positive relationship with education does not have exceptions in the case of unemployment, with the RoU being an almost marginal phenomenon for illiterates but almost reaching 20 per cent for the members of labour force with high education. The range by educational level is larger for women than for men, in the case of women, with values being included between 2.8 per cent for the illiterates to 31.9 per cent for those with high education

The analysis in terms of flows. Flow data provide an updated vision of the needs of the labour market in terms of educational level and the coherence of the labour supply with those needs. The elaboration shows that, between 2010 and 2015, 40 per cent of the people hired had no formal education or less than intermediate education, 32 per cent had intermediate education and 26 per cent had higher education. It must also be underlined that around 5 per cent of the newly employed were illiterate. This well illustrates the fact that a subpopulation of the employed can decline while registering new entries. Obviously, this is due to the fact that entries are paralleled by a greater number of exits.

A comparison of entries into labour force and employment shows that entries into the labour force exceeded those into employment for every educational level. Moreover, entries by educational level into labour force were more polarized than those into employment; the only group registering a lower percentage being that of people with intermediate education.

Data confirm that the supply of women in terms of flow is more polarized from an educational attainment perspective than that of men, and the same is true for the demand. Moreover, the educational level of women that have entered into employment is notably higher than that of men.

Entries into labour force and employment allow estimating the distribution of the additional unemployed, which, as known, amounted to a little more than 1.5 million, by educational level. The most affected group was that with intermediate education (39.2%), followed by very similar percentages of the group with low and with high education (respectively 30.6% and 30.2%). Also, in this case, the data for men and women notably differ. In the case of men, the most affected group was represented by people with a middle-low level of education, while in the case of women, the most affected were those with a middle-high level of education.

PART III
LABOUR MARKET AND DEMOGRAPHIC SCENARIOS

Egypt

The structural excess of labour. Between 2015 and 2030, the Egyptian WAP is projected to increase by 19 million. Generational entries are also expected to progressively grow from 8.6 million in the first five-year period to 9.5 million in the second, to 12 million in the third.

The labour market demographic scenarios will be based upon three hypotheses on labour force participation and three hypotheses on labour demand, summarized in the following table.

Table a. Egypt: Hypotheses on labour force participation and labour demand

	Labour force		Employment
A	The rates of activity (RoA) will remain constant at the 2015 level of 48.9%.	1	Employment will grow at the same rate registered in the last five years (4.3%).
B	The RoA will increase by half a percentage point every year.	2	Employment will grow at 7% over every five-year period.
C	The RoA will increase by 1 percentage point every year.	3	Employment will grow at 9.5% over every five-year period.

For each of the nine scenarios obtained crossing these hypotheses, the structural excess of labour as the difference between the increase in labour supply and labour demand was computed.

Over the upcoming 15-year period, the excess of labour is included between: (a) a minimum of 1.7 million in the scenario in which the rate of participation remains constant and employment increases; and (b) a maximum of 17.1 million in the scenario in which labour force participation increases at the fastest rate considered, while employment is projected to increase at the present rate of "only" 0.9 per cent per year. In the central scenario characterized by a parallel increase in employment and labour force, the yearly excess of labour is estimated in a little more than 750,000 people per year.

Both unemployment and the RoU increase in all scenarios, the increase being positively related to the RoA and inversely related to employment growth. It must be underlined that in numerous scenarios, unemployment reaches levels that could result in social unrest.

The excess of labour by educational level. The use of a generational flow approach allows to estimate the structure of the excess of labour by educational level assuming a positive relationship between the demand and the supply of labour, which implies that each level of entries into employment is linked to only one level of entries into labour force.

It is forecasted that the educational level of the excess supply will be quite high, with more than 42 per cent of its members with a high educational level and just around one fourth with a low educational level; values are not very sensitive to changes in the level of demand and supply.

The educational level of both labour force and employment is projected to increase in all scenarios due to the generational turnover that brings into the labour market young generations more educated than the old ones exiting for retirement. In both cases, the increase is positively related to employment growth. However, the share of people with less than intermediate education is projected to continue to weigh around 40 per cent, while the percentage of those with education above average remains short of 25 per cent. In the case of unemployment, the estimates suggest an increase in polarization with a notable decline of the unemployed with intermediate education.

France, Germany, Italy and the United Kingdom

Following the same procedure, estimates were made on labour market and demographic scenarios for the four largest European Union countries over the period 2015–2030.

Demographic trends. Between 2000 and 2015, only two of the four countries (Germany and Italy) were affected by a negative natural balance that was especially pronounced in the case of Germany, but relevant in Italy as well. However, all four countries registered relevant, positive migration balances. In the case of Germany, the migration balance covered around 60 per cent of the natural decline of WAP, while in the case of Italy, the migration balance more than covered the natural decrease of WAP. As for the cases of France and the United Kingdom, the migration balance contributed to the growth of WAP by 56 and 85 per cent respectively. In conclusion, in all countries but Germany, WAP increased, the largest increase being registered by France (9.7%) and the United Kingdom (9.4%).

Table b. France, Germany, Italy and the United Kingdom: WAP in 2000 and 2015, natural balance, migration balance and total balance between 2000 and 2015

	WAP 2000	Natural balance	Migration balance	Total balance	WAP 2015
France	37,317	1,598	2,013	3,610	40,927
Germany	55,077	-5,229	3,116	-2,113	52,964
Italy	38,644	-2,057	2,448	391	39,035
United Kingdom	37,750	548	2,993	3,541	41,291
Total	**168,787**	**-5,140**	**10,570**	**5,430**	**174,217**

Considering the four countries together, in the absence of immigration WAP would have declined by more than 5 million people (-3%). The arrival of 10.6 million migrants allowed the population to increase by 5.4 million (+3.2%).

Labour market. Between 2000 and 2015, the level of employment increased in all four countries, with France and the United Kingdom registering the highest rates of growth (13.4 and 12 % respectively) and Germany and Italy registering the lowest (8.9 and 6.6%).

Table c. France, Germany, Italy and the United Kingdom: Total employment in 2000 and 2015 and absolute change and percentage change from 2000 to 2015

	2000	Abs. change	% change	2015
France	23,029	3,090	13.4	26,119
Germany	35,977	3,199	8.9	39,176
Italy	20,620	1,353	6.6	21,973
United Kingdom	26,805	3,223	12.0	30,028
Total	**106,430**	**10,865**	**10.2**	**117,295**

Despite immigration, the RoE increased in all four countries (especially in Germany); the RoU declined in both Germany and the United Kingdom, while remaining substantially constant in France. It increased in Italy, the country that in 2015 was still affected by the international financial crisis.

The scenarios

Demographic trends. Between 2015 and 2030, all four countries are projected to register a negative natural balance: France and the United Kingdom will move from a positive to a negative value, while Italy and Germany will register a notable increase of the already negative value registered in the previous period.

The labour market scenarios: Structural shortage of labour and migration balance. For each of the four countries, specific assumptions on labour force participation and employment growth have been adopted, following a simple and homogeneous pattern. For the labour force, two scenarios were considered: (a) the rate of participation increases at the rate registered between 2000 and 2015; and (b) it increases at a rate 1.5 times that value.

For employment, three scenarios were considered: (a) employment growth is equal to that registered between 2000 and 2015; (b) the increase is equal to two thirds that value; and (c) the increase is equal to four thirds. This approach generates six scenarios for each country.

The main emerging elements are the following:

- The expected total labour shortage of the four countries amounts to around 15.2 million, which implies a migration balance of almost 20 million (1.3 million per year).

- Germany ranks first in terms of labour shortage and migration balance; the expected yearly migration balance is estimated at around 700,000 per year, followed by Italy (247,000), France (242, 000) and the United Kingdom (124,000).
- In France, Germany and the United Kingdom, the migration balance will exceed the natural balance and therefore WAP is projected to increase. Italy is the only country in which the migration balance will not be sufficient to offset the natural decline of WAP.
- In 2030, the WAP of Germany is projected to be back to the 2000 value; the WAP of France is to be larger than that of the United Kingdom, while the WAP of Italy will decline below the 2000 level.

Table d. France, Germany, Italy and the United Kingdom: WAP in 2015 and 2030 natural balance, labour shortage, migration balance and total balance in an intermediate scenario

	WAP 2015	Natural balance	Labour shortage	Migration balance total	Total balance	WAP 2030
France	40,927	-1,119	-2,802	3,643	2,524	43,451
Germany	52,964	-8,496	-8,178	10,631	2,135	55,099
Italy	39,035	-4,888	-2,850	3,705	-1,183	37,852
United Kingdom	41,291	-1,129	-1,431	1,861	731	42,022
Total	**174,217**	**-15,633**	**-15,261**	**19,840**	**4,206**	**178,423**

The fact that all four countries need foreign labour is clearly shown by the RoE that increase in all of them, even in the scenario with the lowest growth in employment and the highest increase in participation. At the same time, the RoU is projected to decline in France, Italy and the United Kingdom, while in Germany, it is projected to reach a maximum of 5.5 per cent.

The most interesting result of the scenarios, also for its absolute novelty, is that related to the educational level. According to the estimates, 38.1 per cent of the workers needed by the four countries should have a high educational level, and 48.7 per cent an intermediate education. This need of highly educated migrants is especially pronounced in France (55.6%) and in the United Kingdom (54.8%). Not surprisingly, Germany is the country that especially needs technicians, while in Italy still 20 % of the labour shortage is represented by people with low educational level.

Table e. France, Germany, Italy and the United Kingdom: Structure of labour shortage by educational level (absolute values and percentage composition)

	Educational level					
	Low	Intermediate	High	Low	Intermediate	High
	Absolute values			Percentage composition		
France		44.4	55.6		-1,244	-1,558
Germany	16.3	52.9	30.9	-1,331	-4,323	-2,523
Italy	21.7	44.9	33.4	-620	-1,280	-951
United Kingdom	4.8	40.5	54.8	-69	-579	-784
Total	**13.2**	**48.7**	**38.1**	**-2,020**	**-7,426**	**-5,816**

Main conclusion

Egypt. The analysis has clearly shown that, for at least 15 years (but most probably for a much longer period), the Egyptian economy cannot attain the rates of economic growth requested to absorb the generations that will exit the education and vocational training system. Egypt will be affected by an increasing structural excess of labour that, most importantly, will be characterized by a high and increasing educational level. This will not only determine extremely high and unprecedented levels of unemployment and therefore poverty, but could also jeopardize the social stability of the country.

In this situation, emigration is not an option but a necessity.

However, Egypt must also strive to reduce the structural excess of labour. Therefore, it is an immediate necessity to promote a fast decline in fertility rate. Furthermore, Egypt should strengthen all the necessary socioeconomic economic policies.

Sustained economic growth is a top priority. In order to keep the present already extremely low RoE constant, the number of jobs should grow at an average rate of more than 2 per cent per year, which implies a rate of gross domestic product (GDP) growth close to 5 per cent. However, it must be underlined that this will not prevent unemployment from notably growing because the technological innovations to be adopted by Egypt would lower the employment-income elasticity.

A process of industrial restructuring must be put immediately under way. The agricultural sector must continue to play a key role, and it should become the origin of an integrated agro-food sector, bringing food production close to the place of origin of raw materials. The traditional sectors such as textile must be revived, while the traditions of a rich handcrafted production should be maintained. Special attention should be devoted to tourism as well through a well-aimed communication policy based on a renewed image of the country. However, the most necessary step is that of progressively shifting the engine of economic and employment growth from traditional sectors to clusters with higher technological and knowledge content. This is also required and could be sustained by the increase in the educational level of labour supply.

Women's labour market participation must be increased. Enlarging the presence of women in the labour market is not only a question of social equity. The potentialities are the same for men and women, and an unequal participation in the labour market negatively affects productivity. It is therefore in the general interest of the country to reach a more equitable distribution of jobs between men and women.

Improving the educational level cannot be postponed. Education represents a key factor to sustaining the social and economic development of the country and will also represent a precondition for regular migration flows, since an increasing number of countries will need foreign labour with a high level of education.

Better cooperation and coordination mechanisms with a number of destination countries for enhanced channels of regular migration. The above-mentioned WAP indicators of Egypt shall guide policymakers towards building cooperation between countries across the Mediterranean (especially European Union countries with declining WAP). Not only, to meet the demographic and economic challenges expected to rise in the coming years, but also to better plan for and maximize the potential of demand-driven migration.

France, Germany, Italy and the United Kingdom

Between 2015 and 2030, in the absence of immigration, the WAP of France, Germany, Italy and the United Kingdom combined will decline by more than 15 million. This represents a precondition for a notable structural need for foreign labour.

In an intermediate scenario of employment and participation growth, the need for foreign labour will amount to more than 15 million, which would translate into an immigration balance of around 20 million. Due to the interplay of demographic trends, labour market size and structure, Germany is projected to have the largest share (53%), followed by Italy (18.7%), France (18.4%) and lastly, the United Kingdom (9.4%).

Finally, the analysis has shown that only a small minority (around 13%) of the labour needed by the four countries could have a low educational level, almost half need to have an intermediate education and 38 per cent high education. Notable differences exist between countries depending on the labour market structure and local supply.

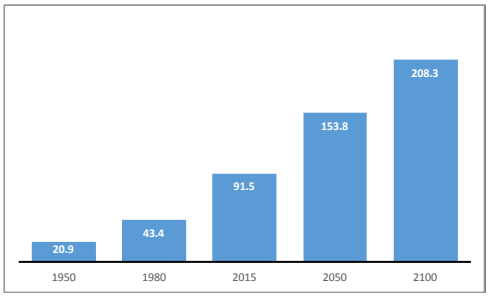
In conclusion, the opposite and complementary demographic and labour market situations described should be sufficient to realize that there is only one rational solution for both groups of countries: to sit together, plan and manage migration flows that will satisfy the opposite needs of Egypt and countries with a structural excess of labour and those of European Union member countries and those with a structural shortage of labour.

Part 1: Demographic trends and structure

TOTAL POPULATION

In 1950, Egypt's total population amounted to 20.9 million; after 30 years, it had increased to 43.4 million, and in 2015, it reached 91.5 million.[1] According to the United Nations Department of Economic and Social Affairs Population Division (UN DESA) projections, in a zero migration scenario, it will reach 153.8 million in 2050, and it will exceed the 200 million mark by 2100.

Graph 1.1. Egypt's total population, selected years from 1950 to 2100; in millions



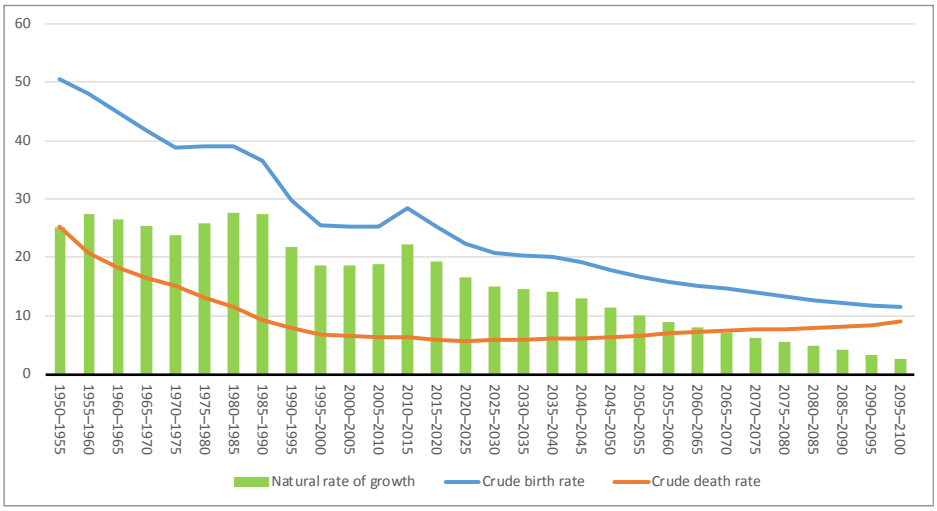
Source: Elaboration from UN DESA, 2015.

[1] Around 95 per cent of the Egyptian population is crowded in 5 per cent of the territory, a narrow ribbon of land that follows the Nile and is fertilized by its water.

MORTALITY AND FERTILITY

This extraordinary demographic explosion is the result of a process known as demographic transition,[2] a phenomenon that was already in its way in 1950, as shown by the fact that the crude mortality rate (CMR) was well below the standard value of a traditional society (40, 50 per thousand). However, the crude birth rate (CBR) was still above 50 per thousand so that total population was growing at an average yearly rate of 2.5 per cent.

Graph 1.2. Egypt's crude birth rate (CBR), crude death rate (CDR) and natural rate of growth; from 1950–1955 to 2095–2100



Source: UN DESA estimates 1950–1955 to 2010–2015 and forecast (zero migration scenario) 2015–2020 to 2095–2100.

During the remaining part of the century, the CBR fell slightly more rapidly than the CDR (respectively from 50.6 per thousand to 25.5 per thousand and from 25.4 to 16.8 per thousand), so that the natural growth rate fell to around 1.9 per cent. At present, the CBR and the CDR are respectively equal to 27 per thousand and 6 per thousand, resulting in a natural rate of population growth of around 2 per cent per year (Graph 1.2).

[2] See Annex 1.

Another way to capture the progress of the demographic transition is to analyse other indicators of fertility and mortality, and more specifically the total fertility rate (TFR) and the life expectancy at birth (LEB), as well as one of its most important determinants, the child mortality rate (CHMR). From 1950 to present, the TFR has been cut in half (from 6.6 children per woman to 3.4[3]), but remains extremely much above the replacement rate. In the same period, the LEB has increased from 41.1 years to 70.8, also due to the dramatic decline of the CHMR, from 387 to 24 per thousand. Looking forward, the most relevant UN DESA projection is that the TFR will remain above the replacement level of around 2.1 children per women until 2070.

Table 1.1. Egypt's total fertility rate, life expectancy at birth and child mortality rate, selected years between 1950 and 2100

	TFR	LEB	CMR
1950–1955	6.6	41.1	387
1980–1985	5.2	63.5	102
2010–2015	3.4	70.8	24.2
2045–2050	2.4	76.7	9.3
2095–2100	1.9	84.3	6.9

Source: Elaboration from UN DESA, 2015.

The numbers of births and deaths help to better understand the quantitative impact of the demographic transition. In 1950, the total population was growing at around half a million per year, as a difference between 1.127 million births and 565,000 deaths.

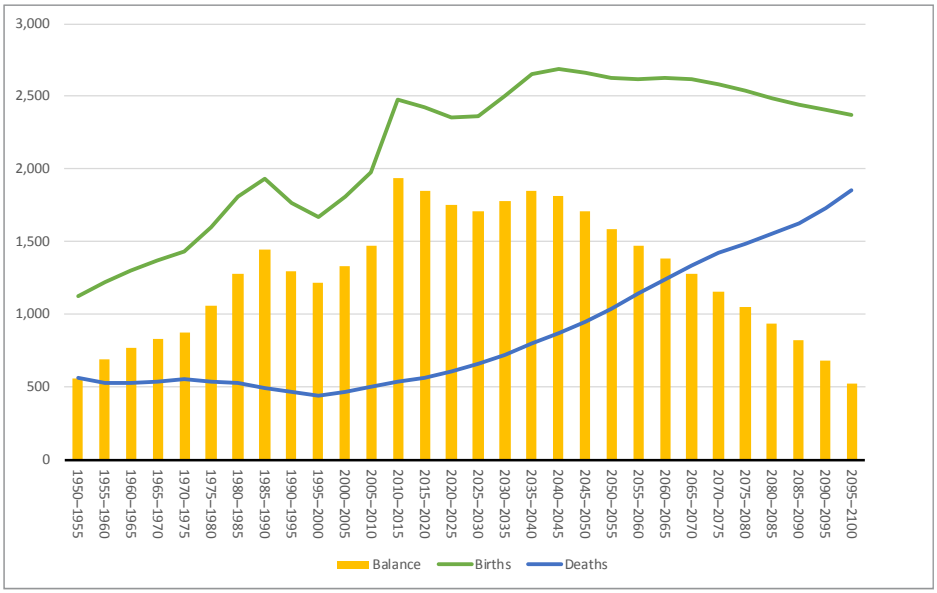
In spite of a slowdown registered at the end of the twentieth century, the number of births has progressively and dramatically increased, and by now it stands at around 2.5 million per year. According to UN DESA, the number of births will peak in the 2040–2045 period at around 2.7 million and will remain above the 2.5 million mark until 2080.

[3] It should be noted that in 2011, the TFR was down to around three children per woman, but it increased in the following years in connection with the decline of the financial sustainability to family planning policies.

The number of deaths has slightly declined until the end of the twentieth century when it reached a historical minimum of around 450,000, to then enter a phase of progressive growth so that by now it is up to 541,000; it will reach 1 million in the middle of the century and 1.85 million at the end of the century.

Due to the combined effect of the trends in births and deaths, the growth of total population reached a maximum of almost 2 million per year between 2010 and 2015; it is projected to decline, but at a very slow pace so that it will be still above 1.5 million by the middle of the century and above half a million at the end of the century.

Graph 1.3. Egypt's births, deaths and population increase, from 1950–1955 to 2095–2100; values in thousands



Source: UN DESA estimates 1950–1955 to 2010–2015 and forecast (zero migration scenario for the period 2015–2100).

POPULATION'S AGE STRUCTURE

The demographic transition has a huge impact not only on the population level, but also on its age structure. As already known, from 1950 to 2015, the total population increased by more than four times, from 21 to 91 million, but almost one third of the increase is due to young people (0–14), almost two thirds to people in the central age group (15–64) and only around 6 per cent to the oldest age group. Therefore, the age structure of the Egyptian population has dramatically changed.

Table 1.2. Egypt's total population by main age group, selected years from 1950 to 2100; values in thousands

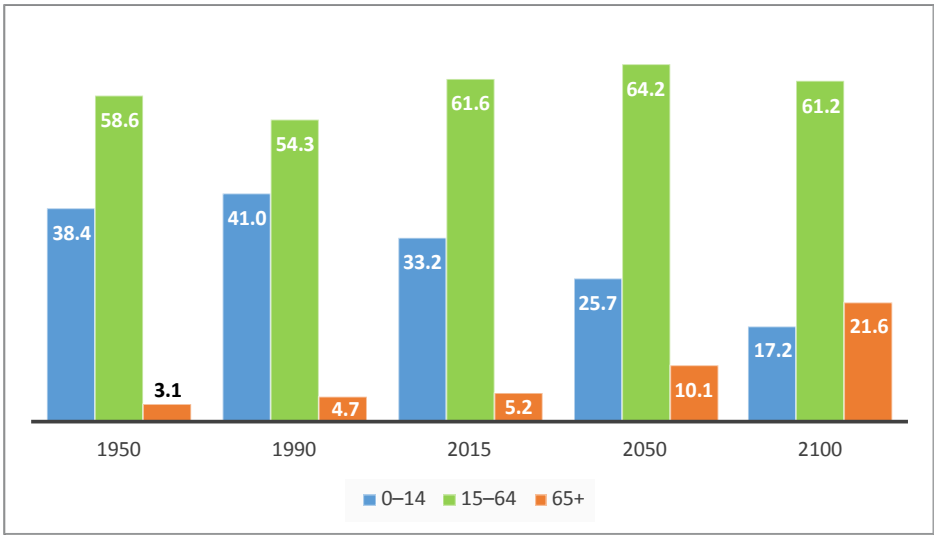
	0–14	15–64	65+	Total
1950	8,020	12,237	640	20,897
1990	23,114	30,636	2,648	56,397
2015	30,344	56,387	4,777	91,508
2050	39,608	98,698	15,544	153,850
2100	35,893	127,423	45,007	208,323
1950–2015	22,325	44,149	4,137	70,611
2015–2050	9,264	42,311	10,767	62,342
2050–2100	-3,715	28,725	29,464	54,473

Source: Elaboration on UN DESA, 2015.

After reaching a maximum of 41 per cent in 1990, the percentage of young people progressively declined to the present value of 33.2 per cent. This trend is expected to continue all along the century, so that the percentage of young people is projected to decline to 17.2 per cent in 2100 (Graph 1.4). However, their number will continue to increase for a long part of the century.

At the other side of the age ladder, in 1950, people aged 65 and more represented only 3.1 per cent of total population. In 65 years, their number has increased by more than seven times, but their share is still as low as 5.2 per cent. The ageing process is forecast to continue and intensify in the next 85 years so that in 2100, old people are expected to be 45 million (21.6 per cent of total population), while the young (0–14) are projected to be 36 million (Table 1.2).

Graph 1.4. Egypt's total population by main age group, selected years between 1950 and 2100; percentage composition



Source: UN DESA estimates 1950–1955 to 2010–2015 and forecast (zero migration) 2015–2020 to 2095–2100

The central age group has continuously increased, doubling around every 30 years, while its percentage has progressively increased from 58.6 per cent to a present value of 61.6 per cent. In the next 35 years, it will increase by another 42 million and by "only" 29 million in the following 50. In conclusion, in the next 85 years, *ceteris paribus* and in absence of migration, the working age population (WAP), the source of labour supply, will increase by another 70 million.

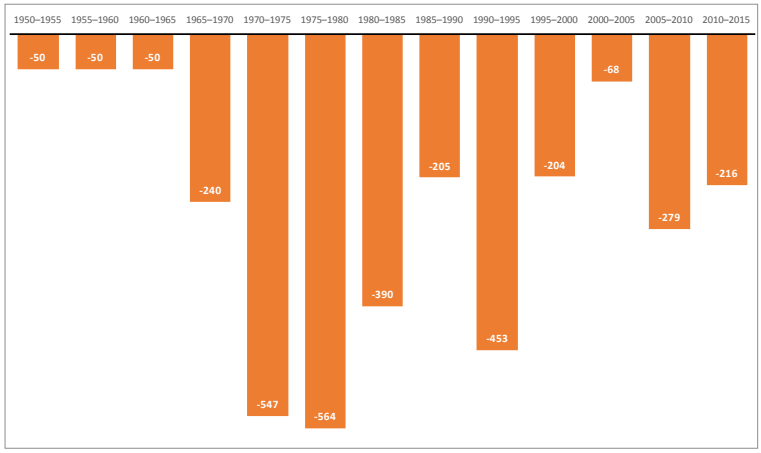
MIGRATION FLOWS

According to UN DESA (2015), after World War II,[4] the Egyptian net migration has always been negative, resulting in a total balance for the 1950–2015 period of -3.3 million. Peak values were registered in the 1970s and again at the beginning of the 1990s, a clear indication that the main determinant of emigration flows was the demand, and more specifically the labour demand coming from the Arab States.

As it has been suggested,[5] the history of Egyptian migration presents different phases that have their origin in changing international conditions, the labour market needs, particularly of the Arab regions, and also different economic factors and policy decisions at the national level.

In the first phase, the Government of Egypt tried to prevent migration by providing job opportunities, but it was soon evident that the Egyptian economy could not grow fast enough to provide the number of jobs necessary to satisfy the growth in labour supply determined by demographic trends. So in 1971, the State authorized both temporary and permanent migration, and in 1974, lifted the remaining restrictions on labour migration.

Graph 1.5. Egypt's migration balance in five years, from 1950–1955 to 2010–2015; values in thousands



Source: Elaboration on UN DESA, 2015.

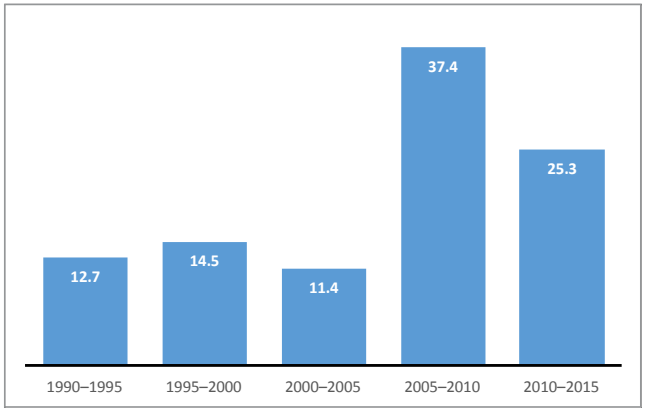
4 "Until the mid 50's foreigners came to Egypt, but Egyptians rarely migrated abroad." (A. Zohry, "The place of Egypt in the regional migration system as a receiving country", *Revue Européenne des Migration Internationales*, 19(3):129–149 (2003))

5 A. Zohry, "Migration and development in Egypt", in: *Migration from the Middle East and North Africa to Europe: Past Developments, Current Status and Future Potentials* (M. Bommes, H. Fassmann and W. Sievers (eds.) (IMISCOE Research, Amsterdam University Press, 2014), pp. 75–98.

In the 1970s, there was a very relevant expansion in the demand of foreign labour by Arab countries, where the increase in the price of oil fueled big economic ambitions. In light of this new situation, the Government of Egypt further eased migration procedures, and in 1981, created the Ministry of State for Emigration Affairs that drew up an overall migration strategy. This period was also characterized by an increasing demand for teachers coming from Arab Gulf countries, while Iraq became a favoured destination for unskilled labour.

In the following years, the Islamic Republic of Iran–Iraq War, together with the decline in the price of oil, led to a decrease in the number of Egyptian migrants that did then stagnate in the following years.

Graph 1.6. Percentage changes in the number of Egyptians living abroad (1990–2015); five-year values



Source: UN DESA, 2013.

The major role is played by Arab countries: between the first 10 countries of arrival, in fact, there are only two non-Arab countries – United States and Italy. Between 1990 and 2015, the concentration has notably augmented, with some countries increasing their weight and others becoming less relevant.

Also, the Egyptian Ministry of Foreign Affairs collect data through its missions abroad and provides the number of Egyptian migrants registered at the mission offices and estimates of those not registered (Table 1.3). According to this source, the former amounts to just a little more than 2 million, the latter to 5.4 million.

Less than one third of Egyptian migrants register their presence with official government agencies, but the percentage of registration largely differs between regions. In Arab countries, the registered are a little more than one third, while in the other two relevant areas of migration, the percentage is much lower: 17 per cent in Europe and 7.8 per cent in North America.

The registered are extremely concentrated; 87 per cent live in Arab countries, 6.7 per cent in European countries and 5.3 per cent in North America. The non-registered have a much lower concentration level: 58.6 per cent are in Arab countries, 23.3 per cent in North America and 12.3 per cent in European countries.

In conclusion, according to the Ministry of Foreign Affairs, Egyptian migrants amount to almost 7.5 million, and they work mainly in three regions: 2/3 in Arab countries, 18.4 per cent in North America and 10.4 per cent in Europe. The presence in Australia is estimated at 3.4 per cent while Asia, South America and Africa together account for only 1 per cent (Table 1.3).

Table 1.3. Registered and estimated Egyptian migrants by areas of destination; absolute values in thousands and percentage composition; registered and not registered; 2015

	Registered by mission	Not registered (mission estimates)	Total mission estimates	Registered by mission	Not registered (mission estimates)	Total mission estimates	Registered/ Total
	Absolute values			Percentage composition			
Arab countries	1,775	3,163	4,938	87.4	58.6	66.5	35.9
European countries	135	662	797	6.6	12.3	10.7	16.9
North American countries	107	1,260	1,367	5.3	23.3	18.4	7.8
Asian countries	4	17	21	0.2	0.3	0.3	19.0
Australia	4	253	257	0.2	4.7	3.5	1.6
South American countries	1	6	7	0.0	0.1	0.1	14.3
African countries	6	38	44	0.3	0.7	0.6	13.6
Total	**2,032**	**5,399**	**7,431**	**100.0**	**100.0**	**100.0**	**27.3**

Source: Ministry of Foreign Affairs.

A closer look to the main areas of emigration shows that according to the Ministry of Foreign Affairs, the main destination countries are four, in the following order of relevance: Saudi Arabia, Jordan, the United Arab Emirates and Kuwait. To be noted, almost all registered migrants were in Saudi Arabia (Table 1.4).

Table 1.4. Arab States with the higher percentage of Egyptian migrants (2015)

	Not registered	Registered	Total
	Percentage composition by country		
Saudi Arabia	41.6	97.5	56.4
Jordan	23.3	0.2	17.2
United Arab Emirates	14.4	0.9	10.8
Kuwait	13.2	0	9.7
Others	7.5	1.4	5.9
Total	**100.0**	**100.0**	**100.0**

Source: Ministry of Foreign Affairs.

It should be underlined that migration to the Gulf countries has always been characterized by temporary work contracts without any perspective of permanent stay and no possibility to obtain citizen privileges, while the migration to Europe, North America and Australia are motivated and based on the hope of permanent stay.

Part 2: The labour market

RECENT TRENDS OF THE MAIN LABOUR MARKET VARIABLES (2010–2015)

This section of the report presents the main characteristics and recent tendencies of the Egyptian labour market at the national level. The analysis will be based almost exclusively on the data provided by the Labour Force Survey run by the Central Agency for Public Mobilization and Statistic (CAPMAS). For each argument considered, the standard approach in terms of stock will be followed by an analysis in terms of flows.

Stock analysis

An inspection of the absolute values of the main labour market variables (measured over the age interval 15–64) in 2010 and 2015 (Table 2.1) together with their absolute and percentage changes (Table 2.2), suggests the following observations:

- WAP increased at the very high pace of 1.542 million per year (that is by 3.1% per year); men increased slightly more than women;

- Labour force grew at a much lower rate of 1.8 per cent, which corresponds to 460,000 additional people in the labour supply per year; in this case, the rate of increase of women was higher than that of men, but women still represent just 30 per cent of the additional supply;
- The growth in employment was even lower, 0.9 per cent (+200,000 per year), with women having obtained 43 per cent of all the additional jobs; and
- As a consequence, total unemployment grew more than employment, at an average yearly rate of 260,000 per year (11.1%), from 2.35 million in 2010 to 3.65 million in 2015.

Table 2.1. Egypt's WAP, labour force, employment and unemployment; absolute values (2010 and 2015) and absolute changes (2010 to 2015); in thousands

	2010			2015			2010–2015		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
WAP	25,174	24,458	49,632	29,097	28,247	57,344	3,923	3,790	7,713
Labour force	19,765	5,989	25,754	21,382	6,673	28,055	1,617	684	2,301
Employment	18,778	4,625	23,403	19,350	5,053	24,403	572	428	1,000
Unemployment	987	1,364	2,351	2,032	1,620	3,652	1,045	256	1,301

Table 2.2. Egypt's WAP, labour force, employment and unemployment; yearly absolute and percentage changes (2010–2015)

	Average yearly absolute change			Average yearly percentage change		
	Male	Female	Total	Male	Female	Total
WAP	785	758	1,543	3.1	3.1	3.1
Labour force	323	137	460	1.6	2.3	1.8
Employment	114	86	200	0.6	1.9	0.9
Unemployment	209	51	260	21.2	3.8	11.1

Therefore, as shown by Table 2.3:

- The rate of employment (RoE) plunged from an already very low level of 47.2 per cent to 42.6 per cent; the decline was much more pronounced for men, whose rate lost 8.1 percentage points, than for the women (-1 percentage point); however, in 2015, women RoE was still as low as 17.9 per cent;

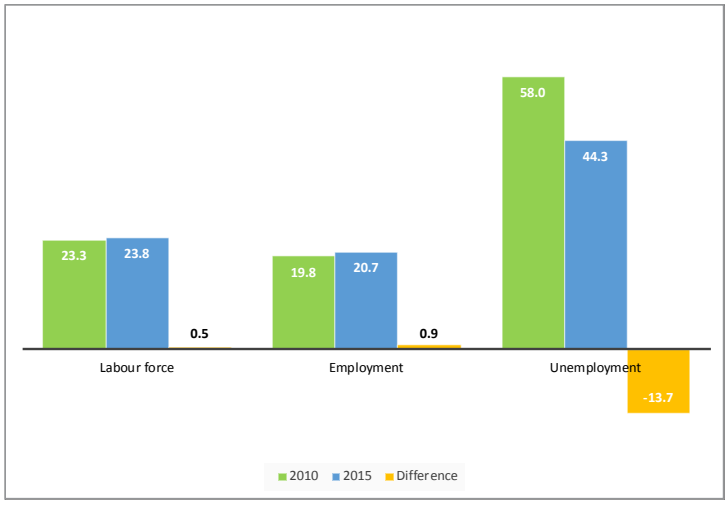
- The rates of activity (RoA) moved in the same direction as the rates of employment, but in a less pronounced way: the total rate declined by 3 percentage points, down to 48.9 per cent, while that of men lost 5 percentage points and was down to 73.5 per cent, and that of women only 0.9 percentage points (down to 23.6%);
- The total rate of unemployment (RoU) increased from 9.1 per cent to 13 per cent; as previous data suggest the situation worsened more for men (from 5% to 9.5%) than for women, whose rate (24.2%) remains, however, more than double that of men.

Table 2.3. Egypt's main labour indicators by sex (2010 and 2015) and difference (2010–2015)

	2010			2015			2010–2015		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
RoA	78.5	24.5	51.9	73.5	23.6	48.9	-5.0	-0.9	-3.0
RoE	74.6	18.9	47.2	66.5	17.9	42.6	-8.1	-1.0	-4.6
RoU	5.0	22.8	9.1	9.5	24.3	13.0	4.5	1.5	3.9

The only positive aspect that emerges from the previous data is that between 2010 and 2015, the percentage of women in the labour force and in employment, while remaining very low, did however slightly increase, while women's share in unemployment declined (Graph 2.1).

Graph 2.1. Egypt's percentage of female in the labour force, employment and unemployment (2010 and 2015)



Flow analysis

Generational flow data allow portraying in a more complete, relevant and suggestive way the dynamic of the Egyptian labour market in the period surveyed. More specifically, this approach allows answering, between others, the following questions: How many people entered WAP for the first time? How many of them entered the labour force, and how many did find a job?[6]

Starting from the labour demand in terms of flow, between 2010 and 2015, every year 813,000 young Egyptians entered employment; three fourths of the entries were due to replacement demand – i.e they were the result of the need to substitute the definitive exits of older workers, as well as the employed who had died or migrated – while only less than one fourth (200,000) were due to the creation of additional jobs. Women represent 34.4 per cent of total entries into employment but, as already known, 42.8 per cent of the entries were due to additional jobs.

In the same period, yearly entries into labour force (i.e. the labour supply in terms of flows) amounted to 1.119 million, while entries into WAP were equal to 2.433 million. Women represented 50.6 per cent of the entries into WAP, but only 32.3 per cent of the entries into the labour force (Table 2.4).

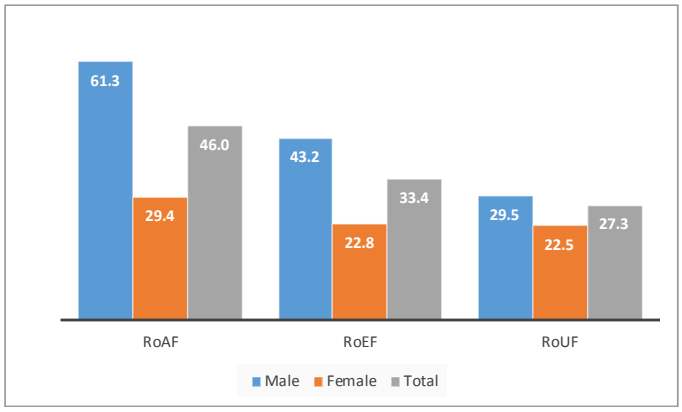
Table 2.4. Egypt's WAP, labour force and employment; generational entries, generational exits and generational balance (2010–2015)

	Five-year values			Average yearly values			W/T
	Male	Female	Total	Male	Female	Total	
	Working age population						
Entries	6,237	6,152	12,163	1,247	1,230	2,433	50.6
Exits	-2,314	-2,362	-4,450	-463	-472	-890	53.1
Balance	3,923	3,790	7,713	785	758	1,543	49.1
	Labour force						
Entries	3,824	1,806	5,593	765	361	1,119	32.3
Exits	-2,207	-1,122	-3,292	-441	-224	-658	34.1
Balance	1,617	684	2,301	323	137	460	29.7
	Employment						
Entries	2,698	1,401	4,066	540	280	813	34.4
Exits	-2,126	-972	-3,067	-425	-194	-613	31.7
Balance	572	428	1,000	114	86	200	42.8

[6] The stock-flow model is presented in Annex 2.

The economic implications of the previous flow data can be better captured analysing the main flow indicators (Graph 2.2).

Graph 2.2. Egypt's flow indicators by sex (2010–2015)



The rate of activity in terms of flows (RoAF) shows that out of 100 people who entered WAP, only 46 entered into the labour force and joined, therefore, the labour supply. The gender-specific rates were 61.3 per cent for men and 29.4 per cent for women.

The extremely low values of these indicators are largely explained by the rate of employment in terms of flow (RoEF) that measure the percentage of entrants in WAP that succeeded in entering employment (the labour demand in terms of flow), which is a good indicator of the probability to find a job for a new entrant into WAP. In summary, only one out of three new entrants in WAP found a job, and the percentages for men and women were respectively 43.2 per cent and 22.8 per cent. The gender differential of the RoEF was therefore much lower than that of the RoAF (20.4 versus 31.9 percentage points).

The rate of unemployment in terms of flows (RoUF) measures the percentage of people that entered the labour force, but did not succeed in finding a job. In spite of the extremely low level of the labour supply in terms of flow, 27.3 per cent of the new entrants in the supply remained unemployed, the percentages being 29.5 for men and 22.5 for women.

Some first considerations on the structural excess of labour

Between 2010 and 2015, 2.433 million young Egyptians entered into working age,[7] the percentage of men and women being almost the same. The relatively very modest demand expressed by the market allowed only a small percentage of these young people (just one third) to enter into employment. This insufficient performance has to be imputed, on the one hand, to the rate of growth in production that generated an increase in employment of only around 200,000 jobs per year and, on the other, to the low average age of the employed that created a modest replacement demand of less than 3 per cent per year.

As already noted, the very low level of demand in relation to the increase in potential supply has discouraged entries into the labour force and fostered migration. This implies that the increase in unemployment, which amounted to 260,000 people per year, is not an adequate measure of the structural excess of labour that has affected the Egyptian economy in the period under consideration. A first alternative could be provided by the number of jobs needed to keep the level of employment at the 2010 level. In order to do so, the Egyptian economy should have created every year around 530,000 jobs more than what it did create and, more specifically, 470,000 for men and 58,000 for women (Table 2.5).

Table 2.5. Yearly structural excess of labour by sex in alternative definitions (2010–2015)

Excess supply equal to:	Male	Female	Total
Increase in unemployment	210,000	50,000	260,000
Jobs needed to keep RoE constant	470,000	58,000	528,000
Jobs needed to provide employment to 90% of male and 50% of female entries into WAP	583,000	335,000	925,000

[7] This number is approximately equal to the the number of young people that exited the educational and vocational training system.

On a more sociological level, it can be observed that in all Mediterranean societies (but not only), men are considered the main breadwinners, and all of them are therefore expected to find a job as soon as possible to sustain their family. At the same time, it seems realistic to assume that the women that enter WAP now would be willing to express a higher labour supply, while a more efficient use of human resources would demand a more equitable distribution of jobs between men and women. An alternative measure of excess supply could therefore be computed considering the need to provide jobs to 90 per cent of the new male entrants in WAP and to 50 per cent of new female entrants. Using this approach, the excess supply of labour in the period considered is of around 925,000 per year.

AGE STRUCTURE AND EVOLUTION OF LABOUR FORCE, EMPLOYMENT AND UNEMPLOYMENT

Stock analysis

Demographic trends, the level and evolution of labour demand are the main determinants of the age structure of labour force, employment and unemployment. Both in 2010 and 2015, the size of the five-year age groups of labour force and employment increases with age, both for men and women, up to the 25–29 age bracket to then decline (Table 2.6); in the case of unemployment, the largest size is registered by the 20–24 age group (Table 2.7).

Table 2.6. Egypt's labour force and employment by sex and five-year age group; absolute values (2010 and 2015)

	2010			2015			2010			2015		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
	Labour force						Employment					
15–19	1,266	328	1,594	1,307	559	1,865	1,136	170	1,306	1,040	396	1,436
20–24	2,885	1,116	4,000	3,087	1,443	4,529	2,405	493	2,898	2,107	853	2,960
25–29	3,308	1,026	4,334	3,543	1,249	4,792	3,084	677	3,761	3,061	814	3,875
30–34	2,532	702	3,234	2,849	812	3,660	2,475	562	3,037	2,717	584	3,301
35–39	2,330	697	3,027	2,399	649	3,048	2,310	662	2,973	2,355	540	2,895
40–44	2,014	608	2,623	2,135	597	2,732	1,995	576	2,572	2,083	534	2,617
45–49	1,986	639	2,625	2,052	486	2,538	1,941	622	2,563	2,027	469	2,495
50–54	1,544	454	1,998	1,974	481	2,455	1,535	447	1,981	1,937	466	2,403
55–59	1,319	327	1,646	1,413	328	1,741	1,316	326	1,642	1,403	327	1,731
60–64	583	91	674	624	71	695	581	91	672	620	71	691
Total	**19,765**	**5,989**	**25,754**	**21,382**	**6,673**	**28,055**	**18,778**	**4,625**	**23,403**	**19,350**	**5,053**	**24,403**

Table 2.7. Egypt's unemployment by sex and five-year age group, absolute values (2010 and 2015)

	Unemployment					
	2010			2015		
	Male	Female	Total	Male	Female	Total
15–19	129	158	287	267	163	430
20–24	480	623	1,103	980	590	1,570
25–29	224	349	573	482	435	917
30–34	57	140	197	132	228	359
35–39	20	35	55	44	109	153
40–44	19	32	51	52	63	115
45–49	45	17	62	25	18	42
50–54	9	7	16	37	15	52
55–59	4	1	5	10	0	10
60–64	2	0	2	4	0	4
Total	**987**	**1,364**	**2,351**	**2,032**	**1,620**	**3,652**

The structure by major age groups of the main labour market variables (Tables 2.8 and 2.9) shows that, on the average, the members of the labour force are younger than the employees, while the unemployed are younger than the members of the labour force.

Table 2.8. Egypt's labour force, employment and unemployment by sex and by main age group, absolute values (2010 and 2015)

	2010			2015			2010–2015		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
	Labour force								
15–29	7,458	2,470	9,928	7,936	3,250	11,186	479	780	1,259
30–49	8,862	2,647	11,509	9,435	2,544	11,978	573	-103	469
50–64	3,446	872	4,318	4,011	879	4,890	566	7	573
Total	**19,765**	**5,989**	**25,754**	**21,382**	**6,673**	**28,055**	**1,617**	**684**	**2,301**
	Employment								
15–29	6,625	1,340	7,965	6,207	2,063	8,270	-417	723	306
30–49	8,722	2,422	11,144	9,182	2,126	11,308	460	-296	164
50–64	3,432	863	4,295	3,960	864	4,824	529	1	529
Total	**18,778**	**4,625**	**23,403**	**19,350**	**5,053**	**24,403**	**572**	**428**	**1,000**

	2010			2015			2010–2015		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
	Unemployment								
15–29	833	1,130	1,963	1,729	1,187	2,916	896	57	953
30–49	140	225	365	253	417	670	112	193	305
50–64	14	9	23	51	15	66	37	6	43
Total	**987**	**1,364**	**2,351**	**2,032**	**1,620**	**3,652**	**1,045**	**256**	**1,301**

This emerges very clearly observing that in 2015, the 15–29 age group weights 39.9 per cent in the case of the labour force, 33.9 per cent for the employed, but 79.8 for the unemployed. At the same time, the 30–49 age groups weights 42.7 per cent for the labour force, 46.3 per cent for the employees and only 18.3 per cent for the unemployed.

Table 2.9. Egypt's labour force, employment and unemployment by sex; percentage composition by main age groups (2010 and 2015)

	2010			2015			2010–2015		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
	Labour force								
15–29	37.7	41.2	38.5	37.1	48.7	39.9	29.6	114.0	54.7
30–49	44.8	44.2	44.7	44.1	38.1	42.7	35.4	-15.1	20.4
50–64	17.4	14.6	16.8	18.8	13.2	17.4	35.0	1.1	24.9
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
	Employment								
15–29	35.3	29.0	34.0	32.1	40.8	33.9	-73.0	168.9	30.6
30–49	46.4	52.4	47.6	47.5	42.1	46.3	80.5	-69.1	16.4
50–64	18.3	18.7	18.4	20.5	17.1	19.8	92.5	0.2	53.0
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
	Unemployment								
15–29	84.4	82.9	83.5	85.1	73.3	79.8	85.7	22.2	73.2
30–49	14.2	16.5	15.5	12.4	25.8	18.3	10.7	75.3	23.4
50–64	1.4	0.7	1.0	2.5	1.0	1.8	3.5	2.5	3.3
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

These observations are supported by the estimates of the average age. Due to its present position along the path of the demographic transition, Egyptian WAP not only is very young, but from 2010 to 2015, its average age has slightly declined as a consequence of the entries of generations of increasing size.

Table 2.10. Egypt's WAP, labour force and employment, average age (2010 and 2015)

	Male	Female	Total
	WAP		
2010	33.9	34.1	34.0
2015	33.6	33.4	33.5
Difference	**-0.3**	**-0.7**	**-0.5**
	Labour force		
2010	36.0	35.0	35.7
2015	36.2	33.1	35.5
Difference	**0.2**	**-1.9**	**-0.3**
	Employment		
2010	36.5	37.9	36.8
2015	37.3	35.2	36.9
Difference	**0.8**	**-2.7**	**0.1**

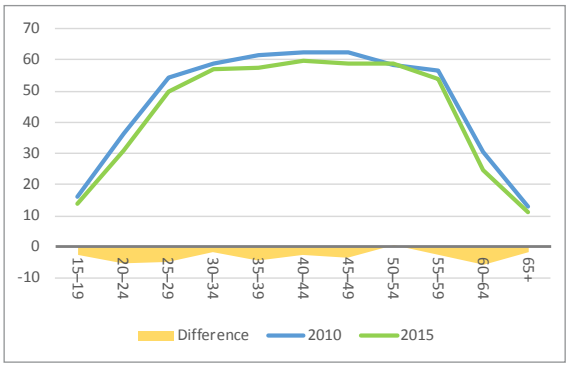
The average age of the people in the labour force is slightly higher that that of those in WAP (35.5 versus 33.5 years) and, as already suggested, the average age of the employed (36.9) is slightly higher than those in the labour force (Table 2.10). This does obviously descend from the fact that the people that enter the labour force cannot find a job immediately. At the same time, the average age of the men in the labour force and in employment (respectively 36.2 and 37.3) is higher than that of women in the same conditions (33.1 and 35.2) due to the different recent trends of the labour demand for men and for women.

The main age-specific labour market indicators

The labour market situation of different age groups is well captured by the age-specific labour market indicators.[8] The age-specific rates of employment for the total (men and women together) show that the presence in employment progressively increases up to age of 29, remains substantially stable between 30 and 55, and then rapidly declines (Graph 2.3). Moreover, from 2010 to 2015, with minor exceptions, all the specific rates of employment have declined, which suggests that all age groups have suffered from the relatively insufficient level of the labour demand registered in this period.

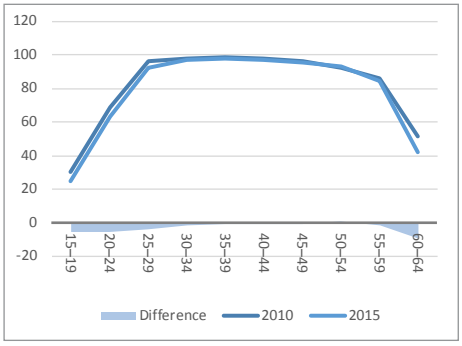
[8] The age-specific rates of activity are computed dividing age-specific variables, for instance the RoE of the 15–19 age group is obtained by dividing the number of people 15–19 that are employed by the number of people 15–19 that are in WAP.

Graph 2.3. Total RoE (2010 and 2015) and differences

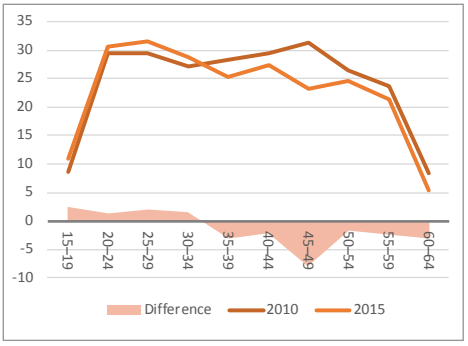


These data hide the notable differences both in the structure and evolution of the gender-specific rates of employment. Men's age-specific indicators present the classical box-shape structure with steep sizes for the first and last age groups and a flat top with values above 90 per cent for the age groups between 30 and 55 (Graph 2.4a). This shape is present in all economies in which men have the social role of main breadwinners. In this situation, not only men have the duty to work, but they also enjoy social priority in getting the available (and socially suitable) jobs. This does also imply that the men with a family have more job priorities over younger non-married men. Coherently with these assumptions, Graph 2.4a shows that the relative lack of labour demand registered in the last five years has affected mainly the men in the first age groups.

Graph 2.4. RoE for male (2.4a) and for female (2.4b); 2010 and 2015 and differences



Graph 2.4a

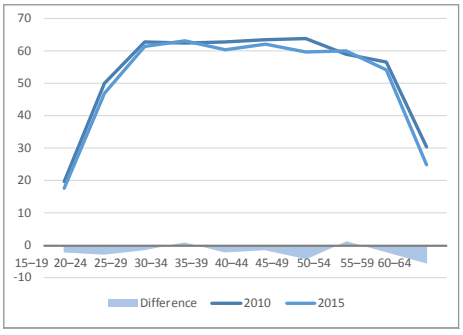


Graph 2.4b

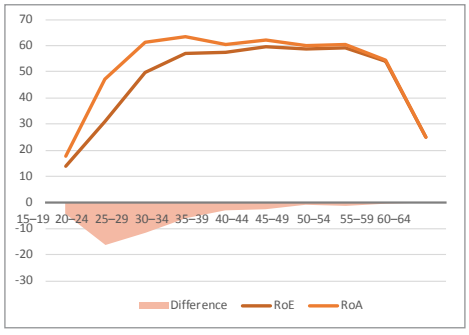
In 2010, the size of the age-specific rates of employment of women progressively increased up to the age of 50 to then rapidly decline (Graph 2.4b). Major changes have intervened in the period being analysed: the rates of employment of the first three age groups have increased, while the rates of all the age groups above 29 have declined, the maximum contraction having been registered by the 45–49 age group. As a consequence, in 2015 also, women-specific rates of employment present a box shape, but with maximum values below 25 per cent. At this point of the analysis, it is an open question to which socioeconomic groups of women are due the changes that have just been presented.

The observations previously addressed to the total age-specific rates of employment apply also to the total age-specific rates of participation for what concerns both the shape (2.5a) and the evolution from 2010 to 2015 (2.5b). Graph 2.5b shows also that the differences between the age-specific RoAs and the age-specific RoEs reach a maximum in correspondence of the 20–24 age bracket to then progressively decline. In substance, as already documented, unemployment affects almost exclusively young people.

Graph 2.5. Male RoA in 2010 and 2015 and differences (2.5a); RoA and RoE and differences in 2015 (2.5b)



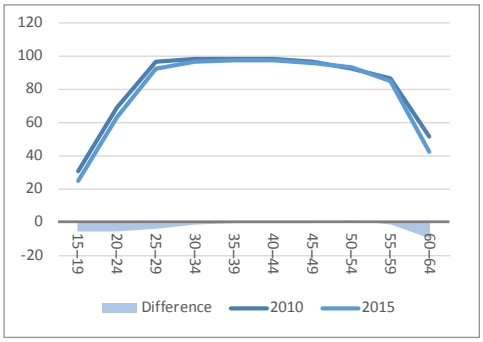
Graph 2.5a



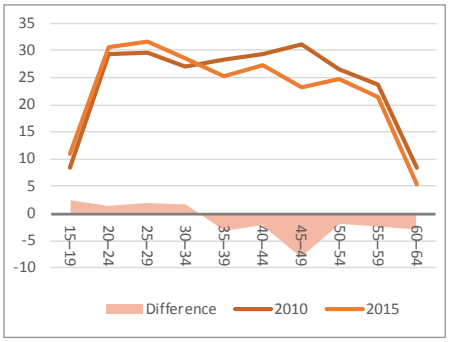
Graph 2.5b

Men's RoA have a box-shape structure, similar to that of the RoE; between 2010 and 2015, the values of the central age group have remained substantially unchanged while those of the first four and of the last age groups have slightly declined, reflecting the discouragement induced by the contraction in demand (Graph 2.6a). Quite interestingly, the changes in the shape of women RoA mirror those of the RoE, with an increase in the first four age groups and a decline in those of the older age groups (Graph 2.6b). The obvious implication is that labour demand strongly influence labour supply.

Graph 2.6. RoA in 2010 and in 2015 and differences; male (2.6a) and female (2.6b)



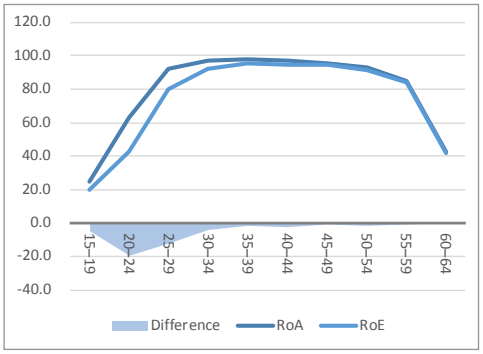
Graph 2.6a



Graph 2.6b

Graph 2.7 compares the age-specific RoA and RoE for men (2.7a) and for women (2.7b). It is evident that in both cases, unemployment affects mainly the first age groups, the situation being more pronounced for the former than for the latter.

Graph 2.7. RoA and RoE in 2015; male (2.7a) and female (2.7b)

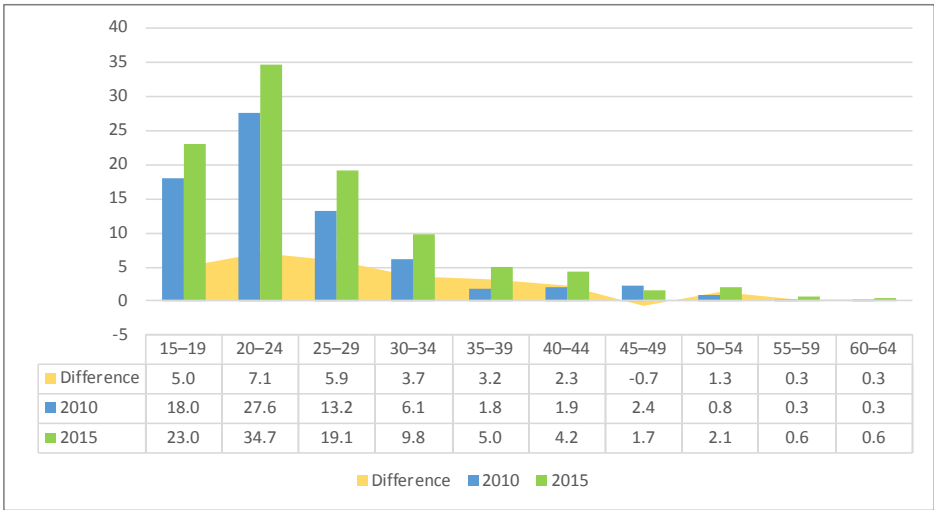


Graph 2.7a

Graph 2.7b

The worsening of the unemployment problem in Egypt is well captured by the specific rates of unemployment that have all increased (Graph 2.8). The maximum increase has been registered by the 20–24 age group that in 2015 has climbed to 34.7 per cent.

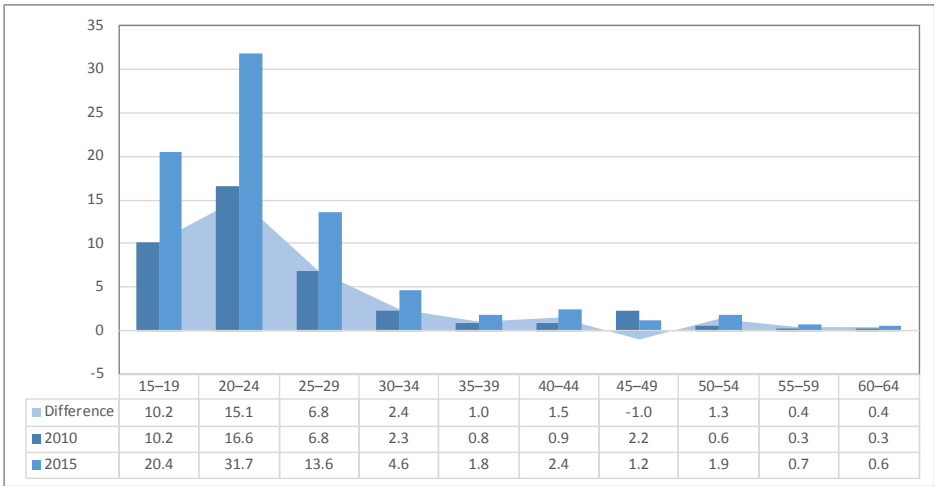
Graph 2.8. Total specific rates of unemployment by age group (2010–2015)



	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64
Difference	5.0	7.1	5.9	3.7	3.2	2.3	-0.7	1.3	0.3	0.3
2010	18.0	27.6	13.2	6.1	1.8	1.9	2.4	0.8	0.3	0.3
2015	23.0	34.7	19.1	9.8	5.0	4.2	1.7	2.1	0.6	0.6

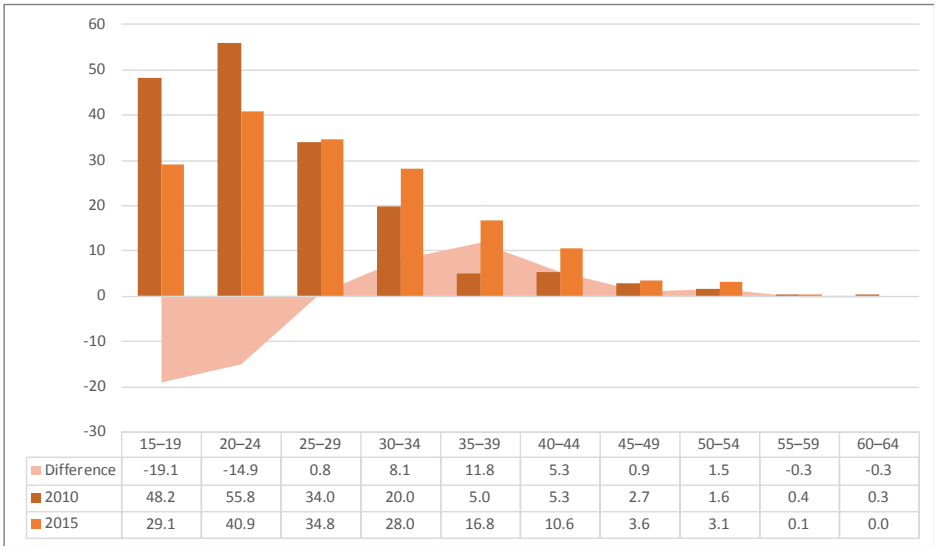
However, this very clear trend is the result of a complex set of opposite tendencies. On the one hand, all men rates have increased, and the maximum change has been registered by the 20–24 age group, whose unemployment rate has more than doubled, reaching a record value of 31.7 per cent; on the other hand, women rates have declined up to the 25–29 age group so that, while the women rates of these age groups remain higher than those of men, the gender differential has notably declined. Moreover, the rates of the older age groups have increased and, in this case, the most affected has been the 35–39 age group.

Graph 2.9. Specific rates of unemployment (2010, 2015 and difference); male (2.9) and female (2.9b)



	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64
Difference	10.2	15.1	6.8	2.4	1.0	1.5	-1.0	1.3	0.4	0.4
2010	10.2	16.6	6.8	2.3	0.8	0.9	2.2	0.6	0.3	0.3
2015	20.4	31.7	13.6	4.6	1.8	2.4	1.2	1.9	0.7	0.6

Graph 2.9a

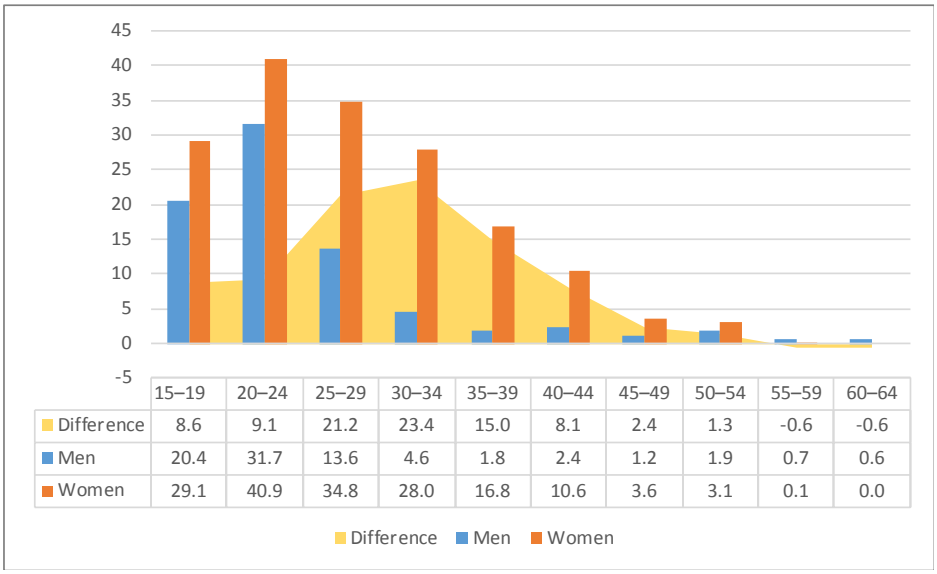


	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64
Difference	-19.1	-14.9	0.8	8.1	11.8	5.3	0.9	1.5	-0.3	-0.3
2010	48.2	55.8	34.0	20.0	5.0	5.3	2.7	1.6	0.4	0.3
2015	29.1	40.9	34.8	28.0	16.8	10.6	3.6	3.1	0.1	0.0

Graph 2.9b

Graph 2.10 summarizes the impact of these trends on the gender differential of the rates of unemployment. Data seem to suggest a convergence of men and women rates for the first age groups and the opposite phenomenon for the central age group.

Graph 2.10. Male and female rates of unemployment and gender differential (2015)



	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64
Difference	8.6	9.1	21.2	23.4	15.0	8.1	2.4	1.3	-0.6	-0.6
Men	20.4	31.7	13.6	4.6	1.8	2.4	1.2	1.9	0.7	0.6
Women	29.1	40.9	34.8	28.0	16.8	10.6	3.6	3.1	0.1	0.0

Flow analysis: Generational entries and exits by sex and age group

Graph 2.11 shows the structure by five-year age group of total generational entries into and generational exits from labour force and employment (male and female). The main elements that emerge are the following:

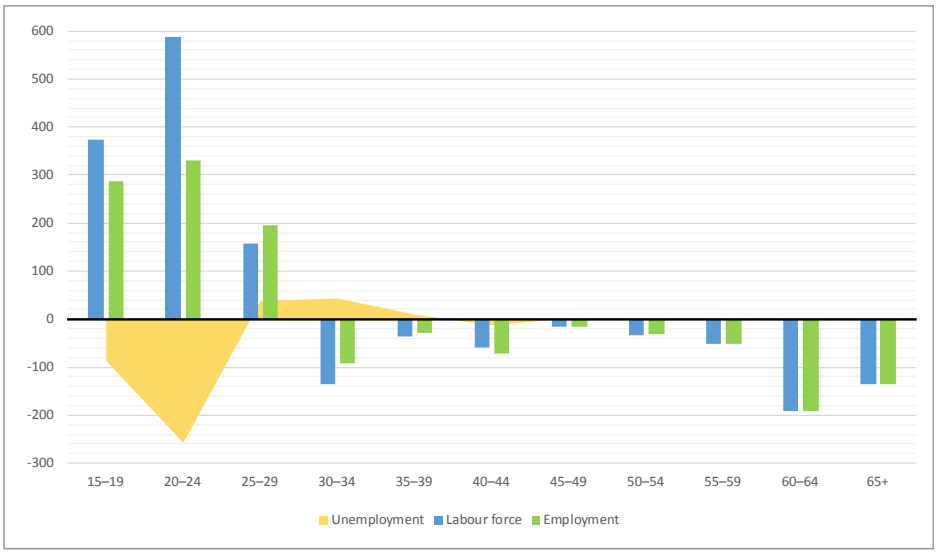
(a) The main age of entry, both into labour force and employment, is the 20–24 age group that accounts for 52.5 per cent, in the case of labour force, and 40.7 per cent, in the case of employment; the second most important age group of entry is the first with respectively 33.4 per cent and 35.3 per cent, while the 25–29 age group accounts for 14.2 per cent of the entries into the labour force and 24 per cent of the entries into employment.

(b) The average age of entry into employment is therefore slightly higher than the average age of entry into labour force (21.4 versus 21 years of age). It is also evident that quite a substantial number of young people that enter the labour force between the age of 15 and 24 cannot find

employment for quite a long time due to the insufficient level of demand; the phenomenon is particularly relevant in correspondence with the main age group of entry. However, starting with the 25–29 age group, the difference between entries into employment and entries into the labour force become positive, which indicates a positive contribution of these age groups to reduction of unemployment.

(c) Generational exits from both labour force and employment start in correspondence of the 30–34 age bracket. However, as to be expected, the majority of exits from the labour force takes place starting at 60, exits from 60 up representing almost 50 per cent of the total. However, a little more than 20 per cent of generational exits take place in the age group 30–34 and 15 per cent in the following two age groups; this could be the result of discouragement, but mainly of emigration.

Graph 2.11. Egypt's total generational flows by five-year age group (2010–2015)

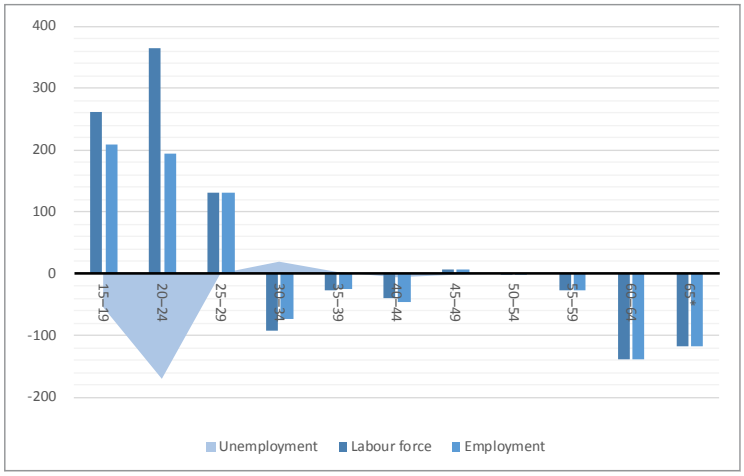


The general structure of entries and exits of men and women does not dramatically differ from each other and from the total (Graph 2.12). Some elements do however deserve attention.

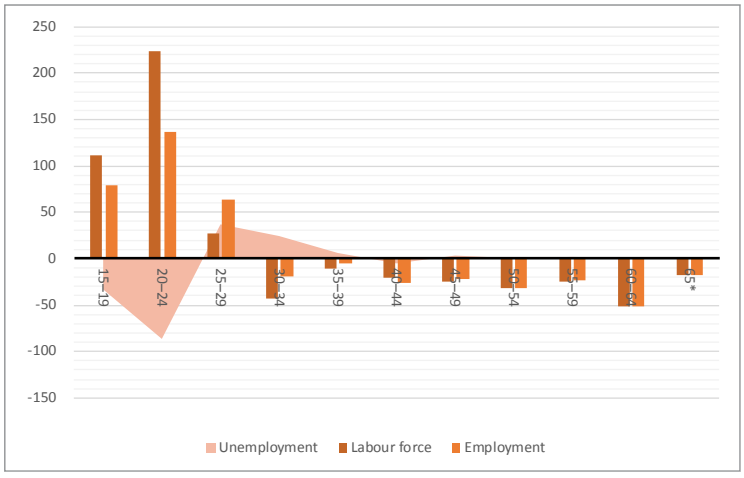
In both cases, the first three classes present positive values and the main age of entry is the 20–24 group. However, women entries are more concentrated in the 20–24 age group; moreover, in the following age group, entries in employment exceed entries in labour force, reducing the level of unemployment; finally, also older age groups contribute to a lower increase in unemployment with exits from labour force exceeding exits from employment.

For both men and women, negative generational flows begin with the 30–34 age bracket. This suggests, as already noted, relevant migration flows especially for men while for women, this phenomenon could be due to the decision to take care of children. However, around two thirds of generational exits from employment are concentrated in the age groups 50 and above. For women, the 50–59 age group is very relevant, accounting for around 28 per cent, while for men, it accounts for around 6 per cent.

Graph 2.12. Egypt's generational flows by five-year age group (2010–2015); male (2.12a) and female (2.12b)



Graph 2.12a

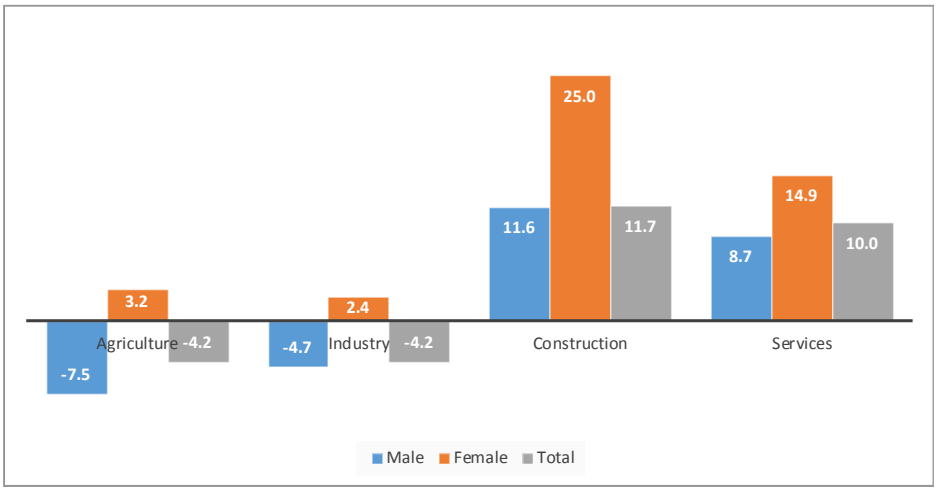


Graph 2.12b

The analysis in terms of stock

As already known, between 2010 and 2015, total employment grew by 1 million. The increase was the result of the algebraic sum of, on the one hand, a decline in agriculture (-273,000 or -4.2%) and industry (-139,000 or -4.2%) and, on the other hand, an increase in construction (313,000 or +11.7%) and services (1,099,000 or +10.0%) (Table 2.11 and Graph 2.13).

Graph 2.13. Employment by sex and sector, percentage growth (2010–2015)



As already known, employment of women grew more than employment of men (9.3% versus 3.0%). Differently from men, it grew in all four sectors and especially in services (+14.9%). However, women's presence remains concentrated in agriculture and services that account respectively for 40.1 and 54.2 per cent of total female employment.

Table 2.11. Employment by sex and main economic sectors; absolute values, absolute change (in thousands) and percentage composition (2010 and 2015)

	2010			2015			2010–2015		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Agriculture	4,464	1,964	6,428	4,128	2,027	6,155	-336	63	-273
Industry	3,066	260	3,326	2,921	266	3,187	-145	6	-139
Construction	2,668	16	2,684	2,977	20	2,997	309	4	313
Services	8,580	2,385	10,965	9,323	2,741	12,064	743	356	1,099
Total	**18,778**	**4,625**	**23,403**	**19,350**	**5,054**	**24,403**	**572**	**429**	**1,001**
Agriculture	23.8	42.5	27.5	21.3	40.1	25.2	-2.4	-2.4	-2.2
Industry	16.3	5.6	14.2	15.1	5.3	13.1	-1.2	-0.4	-1.2
Construction	14.2	0.3	11.5	15.4	0.4	12.3	1.2	0.0	0.8
Services	45.7	51.6	46.9	48.2	54.2	49.4	2.5	2.7	2.6
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**0.0**	**0.0**	**0.0**

As a consequence, the following can be registered:

- A decline in the share of agriculture and industry and an increase in the share of construction and services, so that in 2015, 49.4 per cent of the employed worked in the service sector, 25.2 per cent in agriculture, 13.1 per cent in industry and 12.3 per cent in construction; and
- An increase in the percentage of women employed in all sectors with agriculture and services registering values above average (32.9% and 22.7% respectively) (Table 2.12).

Table 2.12. Percentage of female in the main economic sectors (2010 and 2015)

	2010	2015	2010–2015
	Female/Total		
Agriculture	30.6	32.9	2.4
Industry	7.8	8.3	0.5
Construction	0.6	0.7	0.1
Services	21.7	22.7	1.0
Total	**19.8**	**20.7**	**0.9**

At a more detailed level, all industrial branches, but water supply, registered a decline in employment (Table 2.13). The decline was quite large in mining and electricity. Percentage-wise, it was much more limited in manufacturing (-3.7%), but given the size of the sector, it implied the destruction of 116,000 jobs. Moreover, while employment of men declined by 4.4 per cent, women's employment increased by 4.4 per cent. The percentage of women working in manufacturing remains, however, below 10 per cent of sector employment. As already noted, employment in water supply increased notably, and the increase was especially relevant for women (58.9%).

Table 2.13. Employment in industrial branches; absolute values and total change; in thousands (2010–2015)

	2010			2015			2010–2015		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
	Absolute values								
Mining	45	2	47	37	1	39	-8	0	-8
Manufacturing	2,638	225	2,863	2,522	236	2,758	-116	11	-105
Electricity	243	23	266	191	13	204	-52	-10	-62
Water	140	10	150	171	16	187	31	6	37
Industry	**3,066**	**260**	**3,325**	**2,921**	**266**	**3,187**	**-145**	**6**	**-138**
	Percentage composition						Percentage change		
Mining	1.5	0.7	1.4	1.3	0.5	1.2	-17.0	-17.6	-16.9
Manufacturing	86.0	86.6	86.1	86.3	88.7	86.5	-4.4	4.8	-3.7
Electricity	7.9	8.8	8.0	6.5	4.7	6.4	-21.4	-45.2	-23.4
Water	4.6	3.9	4.5	5.8	6.1	5.9	21.9	58.8	24.5
Industry	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**-4.7**	**2.4**	**-4.2**

Almost three fourths of the employment in the service sector is concentrated in four branches. The most relevant is wholesale and retail trade, followed by public administration, health and transportation (Table 2.14). Between 2010 and 2015, the employment level of the public administration (as well as its share) declined due to the hiring restriction introduced by the Government in 1985. The increase in the employment level of the service sector was mainly due to transportation (whose employment level increased by 430,000 or +29.3%), trade, health, education and accommodation that taken together account for almost the totality of the additional jobs, the first three branches accounting for 71.5 per cent.

Table 2.14. Services: Employment by branches, absolute values and total change; in thousands (2010–2015)

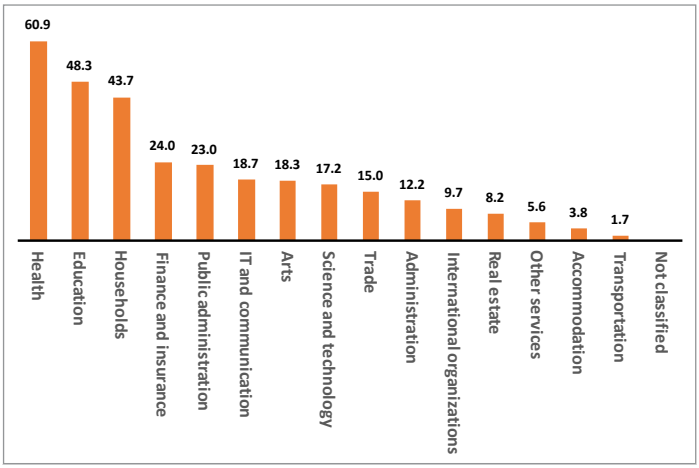
	2010			2015			2010–2015		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
	Absolute values								
Trade	2,323	319	2,641	2,445	432	2,877	122	114	236
Transportation	1,433	30	1,463	1,862	32	1,893	429	2	430
Accommodation	503	21	524	619	25	643	116	3	119
IT and communication	169	41	210	168	38	206	-2	-2	-4
Finance and insurance	143	49	192	121	38	159	-21	-11	-33
Real estate	16	0	16	35	3	38	19	3	22
Science and technology	328	63	392	335	69	405	7	6	13
Administration	155	13	169	163	23	185	8	10	17
Public administration	1,412	441	1,853	1,377	412	1,788	-36	-30	-65
Education	1,112	975	2,086	1,142	1,068	2,210	30	94	124
Health	263	346	608	291	452	743	28	107	135
Arts	86	17	103	94	21	115	8	4	11
Other services	508	23	531	550	33	582	41	10	51
Households	95	42	137	121	94	216	26	53	79
International organizations	2	1	3	3	0	3	1	-1	0
Not classified	32	4	37	0	0	0	-32	-4	-37
Total	**8,580**	**2,385**	**10,966**	**9,323**	**2,741**	**12,063**	**743**	**356**	**1,097**
	Percentage composition						Percentage change		
Trade	27.1	13.4	24.1	26.2	15.8	23.9	5.3	35.7	8.9
Transportation	16.7	1.2	13.3	20.0	1.1	15.7	29.9	5.7	29.4
Accommodation	5.9	0.9	4.8	6.6	0.9	5.3	23.1	15.6	22.7
IT and communication	2.0	1.7	1.9	1.8	1.4	1.7	-1.0	-5.9	-2.0
Finance and insurance	1.7	2.1	1.8	1.3	1.4	1.3	-14.9	-22.0	-17.1
Real estate	0.2	0.0	0.1	0.4	0.1	0.3	121.8	1,450.0	137.1
Science and technology	3.8	2.7	3.6	3.6	2.5	3.4	2.1	9.5	3.3
Administration	1.8	0.5	1.5	1.7	0.8	1.5	4.9	73.3	10.0
Public administration	16.5	18.5	16.9	14.8	15.0	14.8	-2.5	-6.7	-3.5

	2010			2015			2010–2015		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Education	13.0	40.9	19.0	12.2	39.0	18.3	2.7	9.6	5.9
Health	3.1	14.5	5.5	3.1	16.5	6.2	10.7	30.9	22.1
Arts	1.0	0.7	0.9	1.0	0.8	1.0	9.1	20.7	11.0
Other services	5.9	1.0	4.8	5.9	1.2	4.8	8.1	41.3	9.6
Households	1.1	1.7	1.2	1.3	3.4	1.8	27.2	127.2	57.6
International organizations	0.0	0.0	0.0	0.0	0.0	0.0	64.7	-70.0	14.8
Not classified	0.4	0.2	0.3	0.0	0.0	0.0	-100.0	-100.0	-100.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	8.7	14.9	10.0

In conclusion, the positive trend in the employment level of the service sector was due to traditional sectors, the modern sectors like IT, financial activities, professional and administrative professions registering negative or marginal increases.

Women are concentrated in few branches: 39 per cent work in education, 16.5 per cent in the health sector, followed by trade (15.8%) and public administration (15%). If the percentage of women is to be considered, three branches stand out and not surprisingly, they allow women to perform activities close to the one they are normally requested to perform at home: health with 60.9 per cent, education with 48.3 per cent and services for the households with 43.7 per cent (Graph 2.14). Moreover, in all three sectors, the rate of feminization has increased over the period considered.

Graph 2.14. Branches of the service sector; percentage of female over total employment (2015)



It can therefore be concluded that between 2010 and 2015, the performance of the Egyptian labour market not only was insufficient in quantitative terms, but did also show a lack of dynamism in the two main productive sectors (agriculture and manufacturing) and a negative performance in modern service sectors that represent a prerequisite to increase productivity and competitiveness.

The analysis in terms of flows

The role played by each economic sector in providing jobs to the young people exiting from the education system is better shown by the labour demand in terms of flows. As seen in the previous chapter, between 2010 and 2015, generational entries into employment amounted to 4.07 million, 1 million of which due to additional demand (AD). It must be understood that when the same computation is made at a less aggregate level, for instance by economic sector and branch, the total number of entries is larger due to movement from one sector to another or from one branch to another. In the specific case, as shown by Table 2.15, the total amount of entries, once the movements between sectors are taken into considerations, amount to 4.764 million, 700,000 of which are due to inter-sector passages.

This point will be discussed in the latter part of the chapter. It can be observed that it was the service sector that gave the major contribution in absorbing the new entrants into employment (51.1%), followed by agriculture with 27.9 per cent, construction (12.8%) and industry with only 8.2 per cent (Table 2.15). The share of women in total entries was just below one third.

Table 2.15. Generational entries, generational exits and generational balance by sex and main economic sector; values in thousands (2010–2015)

	Male			Female			Total		
	Generational entries	Generational exits	Additional demand	Generational entries	Generational exits	Additional demand	Generational entries	Generational exits	Additional demand
Agriculture	502	-838	-336	826	-764	63	1,328	-1,601	-273
Industry	325	-470	-145	66	-60	6	391	-530	-139
Construction	604	-295	309	8	-4	4	612	-299	313
Services	1,786	-1,043	743	647	-291	356	2,433	-1,334	1,099
Total	**3,218**	**-2,646**	**572**	**1,547**	**-1,118**	**429**	**4,764**	**-3,764**	**1,001**
Agriculture	15.6	31.7	-58.7	53.4	68.3	14.6	27.9	42.5	-27.3
Industry	10.1	17.8	-25.3	4.3	5.3	1.4	8.2	14.1	-13.9
Construction	18.8	11.2	54.0	0.5	0.3	0.9	12.8	7.9	31.3
Services	55.5	39.4	130.0	41.8	26.0	83.0	51.1	35.4	109.9
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Generational entries are the result of two events: (a) definitive exits from employment due to age, deaths and migration; and (b) creation of additional jobs. If men and women together are to be considered, the dominant factor was represented, with 78.7 per cent, by the need to replace exiting workers. The percentage is higher for men than for women (81.8% versus 72.1%).

An important contribution of flow analysis consists in clarifying that even a sector whose total employment is decreasing and tends to be abandoned by young people like agriculture can provide a relevant number of job opportunities. In this case, it can be observed that agriculture absorbed 265,000 young workers (around 28% entries) every year. Generational entries were however fewer than generational exits and therefore, as already known, total employment declined. In practice, not all the workers that left permanently the sector – due to age, death, migration or a passage to another sector – were substituted. However, while this was true for men (whose number declined by 336,000), it was not true for women whose number increased by 63,000. A similar situation characterized industry, where average yearly entries were 65,000 versus 106,000 exits, but women registered a positive additional demand.

In the two other sectors that were more dynamic and created additional jobs, replacement demand represented 54.2 per cent in services and 48.8 per cent in construction. In both cases, replacement demand played a more important role for men than for women.

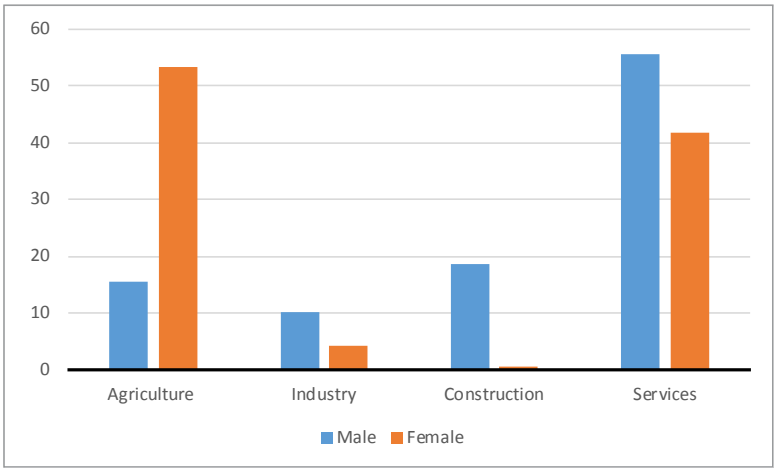
Comparing all economic sectors and main branches (Table 2.16), it can be observed that transportation and trade, with shares of 11.4 per cent and 10.6 per cent respectively, played a more important role than manufacturing that – with a share of 6.7 per cent – precedes education and health.

Table 2.16. Generational entries by sex and economic branches, and percentage of female, in thousands (2010–2015)

	Generational entries			
	Male	Female	Total	% female
Agriculture	15.6	53.4	27.9	62.2
Mining	0.1	0.0	0.1	12.5
Manufacturing	8.2	3.7	6.7	17.8
Electricity	0.3	0.0	0.2	4.5
Water	1.4	0.5	1.1	14.1
Industry	10.1	4.3	8.2	16.8
Construction	18.8	0.5	12.8	1.3
Trade	11.8	8.1	10.6	24.8
Transportation	16.5	0.7	11.4	1.9
Accommodations	4.7	0.6	3.4	6.1
IT and communication	1.3	0.7	1.1	21.8
Finance and insurance	0.6	0.4	0.5	26.7
Real estate	0.6	0.2	0.5	12.4
Science and technology	2.3	1.2	1.9	20.9
Administration	1.0	0.9	1.0	28.8
Public administration	5.9	3.2	5.0	20.6
Education	4.3	11.0	6.5	55.1
Health	1.9	9.5	4.4	70.5
Arts	0.7	0.4	0.6	22.5
Other services	2.8	0.8	2.2	12.1
Households	1.0	4.0	2.0	65.7
International organizations	0.1	0.0	0.0	13.6
Services	55.5	41.8	51.1	26.6
Total	**100.0**	**100.0**	**100.0**	**32.5**

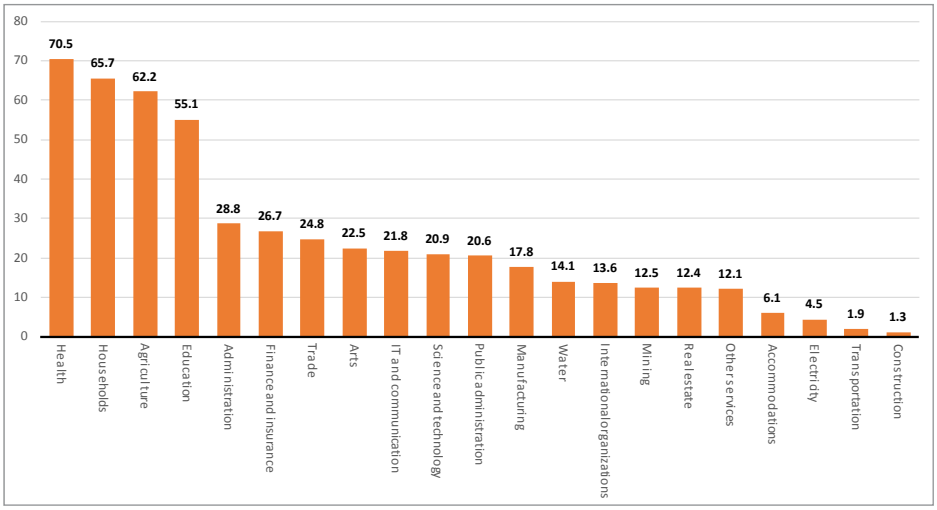
As already seen, the Egyptian labour market is characterized by a relevant gender segmentation, and this appears with even greater evidence from flow data. Women found employment mainly in agriculture and services that accounted respectively for 53.4 per cent and 41.8 per cent of women entries; industry, inclusive of construction, played a minor role with a share of only 4.8 per cent. In the case of men, 55.5 per cent of entries were accounted for by services, 18.8 per cent by construction, 15.6 per cent by agriculture and 10.1 per cent by industry (Graph 2.15). At a less aggregate level, education (11%), health (9.5%) and trade (8.1%) are the branches of the service sector that have the highest share of women entries.

Graph 2.15. Percentages of entries into employment by sex and main economic sector (2010–2015)



If the rate of feminization is to be considered, the ranking is led by four sectors in which women are the majority (health, household services, agriculture and education), followed by the other six in which women entries represent between 20 and 30 per cent of total entries (Graph 2.16). It must also be underlined that the majority of these last sectors are modern sectors, which suggests that women employed in them have, on the average, a high educational level. This does obviously imply that only an increasing minority of women that find a job have a high educational level.

Graph 2.16. Percentage of female in chosen sectors (2015)



Finally going back to the movement from one sector to another, as already indicated, they amounted to almost 700,000, three fourths of which (529,000) were accounted for by men, while the incidence of inter-sector flows was equal to 16.2 per cent for men and 9.4 per cent for women. The higher inter-sector mobility of men reflects the existence of a strong gender segmentation that limits the movements of women between a limited number of jobs. Finally, data suggest that the inter-sector movements start mainly from the agricultural sector but do not allow to well identify the sectors of arrival, although the service sector is certainly very relevant.

Table 2.17. Generational entries and movement between sectors by sex; values in thousands (2010–2015)

	Net entries	Inter-sector movements	Total entries	% inter-sector movements
Male	2,698	520	3,218	16.2
Female	1,401	146	1,547	9.4
Total	**4,098**	**666**	**4,764**	**14.0**

THE EDUCATIONAL LEVEL

The analysis in terms of stock

Working age population. As a consequence of the present position of Egypt along the path of the demographic transition, the population in compulsory education age is increasing at a very fast rate, as well as the number of potential high school and higher education students. Therefore, it is not surprising that the educational level of the Egyptian WAP is quite low and the improvements in recent years have been very modest (Table 2.18).

The situation can be captured observing that in 2015, more than half of the Egyptian population of working age had less than intermediate education (the illiterate representing 21.2% of the total), 32.7 per cent had an intermediate education and 15.2 per cent a high educational level. With respect to 2010, the situation had not changed in a notable way, only the percentage of people with intermediate education having registered a small increase (Graph 2.17).

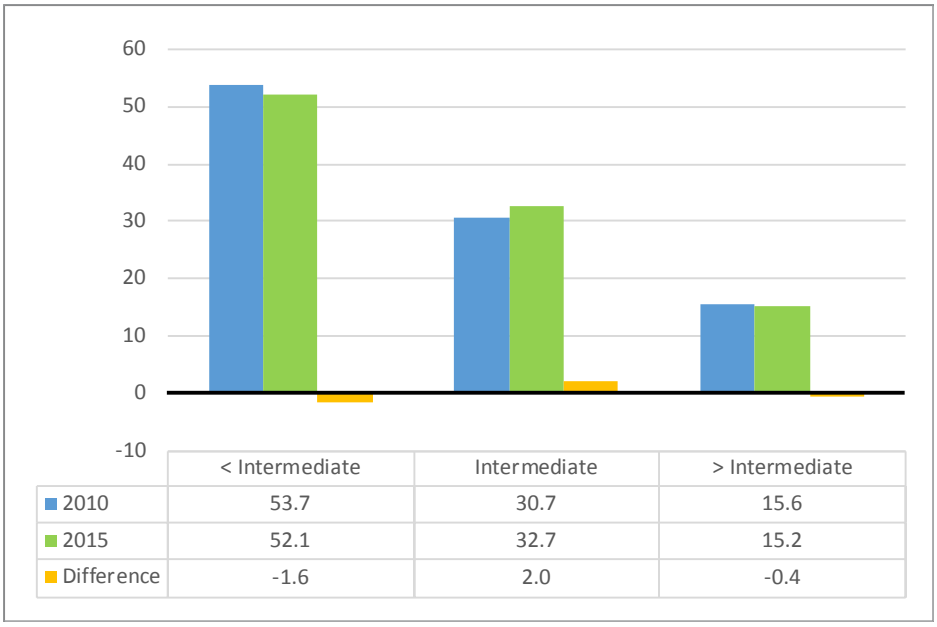
However, it can be observed that between 2010 and 2015, the illiterate declined by 10.5 per cent, while all other educational groups increased. However, only those that had not completed compulsory education and those that had compulsory education as maximum increased above average.[9]

[9] In both cases, the increase was more pronounced for women than for men (43.3% versus 30.3% in the former group, 25.7% versus 20.8% for the latter group). Finally, university graduates increased just below average.

Table 2.18. WAP by sex and educational level, absolute values (2010 and 2015) and absolute change between 2010 and 2015

	Illiterate			< Intermediate			Intermediate			> Intermediate			University			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
	2010																	
15–29	1,240	1,886	3,126	4,389	3,538	7,928	4,623	4,099	8,721	317	292	609	1,216	1,294	2,509	11,785	11,109	22,894
30–49	1,995	4,016	6,011	2,033	1,345	3,378	3,011	2,388	5,399	474	345	819	1,548	1,080	2,628	9,061	9,173	18,234
50–64	1,633	2,841	4,474	1,161	568	1,728	718	387	1,105	148	70	217	668	311	979	4,328	4,176	8,503
Total	**4,868**	**8,743**	**13,611**	**7,583**	**5,451**	**13,034**	**8,352**	**6,874**	**15,225**	**938**	**707**	**1,645**	**3,432**	**2,684**	**6,116**	**25,174**	**24,458**	**49,632**
	2015																	
15–29	919	1,518	2,437	5,944	5,408	11,352	5,435	5,079	10,514	322	291	613	1,472	1,463	2,934	14,092	13,758	27,850
30–49	1,613	3,449	5,062	2,481	1,639	4,120	3,547	2,975	6,521	545	348	893	1,555	1,286	2,841	9,740	9,696	19,437
50–64	1,702	2,982	4,684	1,457	766	2,223	1,105	589	1,695	200	81	281	800	373	1,173	5,264	4,792	10,056
Total	**4,235**	**7,949**	**12,184**	**9,881**	**7,814**	**17,695**	**10,087**	**8,643**	**18,730**	**1,067**	**720**	**1,787**	**3,826**	**3,122**	**6,948**	**29,096**	**28,247**	**57,343**
	2010–2015 (absolute change)																	
15–29	-321	-369	-689	1,554	1,870	3,424	813	980	1,793	5	-1	4	256	169	425	2,307	2,649	4,957
30–49	-382	-567	-949	448	294	742	536	587	1,122	71	3	74	7	206	213	679	523	1,202
50–64	69	141	211	296	198	495	387	203	590	52	11	64	131	63	194	936	617	1,552
Total	**-634**	**-794**	**-1,428**	**2,298**	**2,363**	**4,661**	**1,735**	**1,769**	**3,505**	**129**	**14**	**142**	**394**	**438**	**831**	**3,923**	**3,789**	**7,711**
	2010–2015 (percentage change)																	
15–29	-25.9	-19.5	-22.1	35.4	52.8	43.2	17.6	23.9	20.6	1.7	-0.4	0.7	21.1	13.1	16.9	19.6	23.8	21.7
30–49	-19.1	-14.1	-15.8	22.0	21.9	22.0	17.8	24.6	20.8	15.0	1.0	9.1	0.4	19.1	8.1	7.5	5.7	6.6
50–64	4.2	5.0	4.7	25.5	34.9	28.6	53.9	52.4	53.3	35.5	16.3	29.4	19.6	20.2	19.8	21.6	14.8	18.3
Total	**-13.0**	**-9.1**	**-10.5**	**30.3**	**43.3**	**35.8**	**20.8**	**25.7**	**23.0**	**13.7**	**1.9**	**8.6**	**11.5**	**16.3**	**13.6**	**15.6**	**15.5**	**15.5**

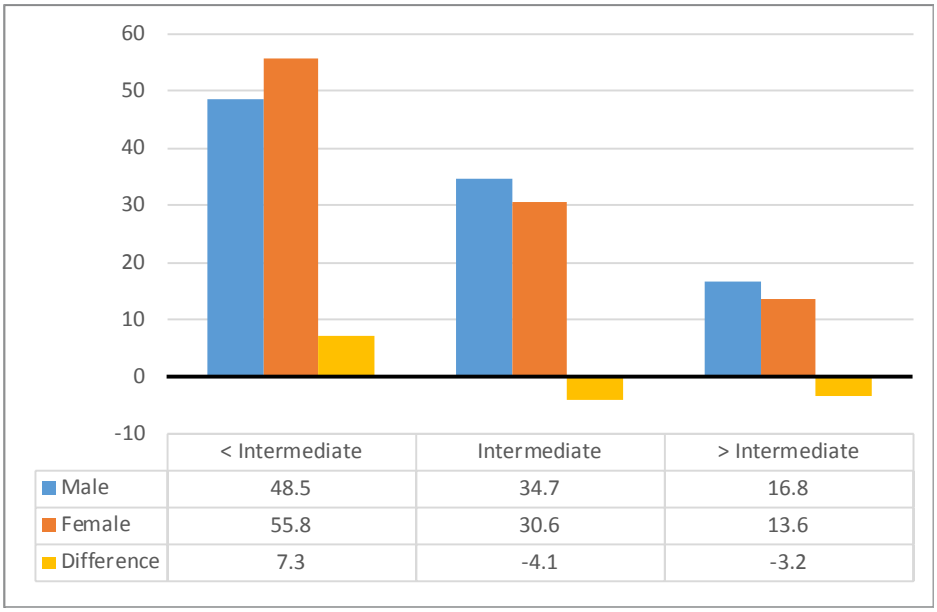
Graph 2.17a. Total WAP percentage distribution by educational level (2010, 2015 and difference)



	< Intermediate	Intermediate	> Intermediate
2010	53.7	30.7	15.6
2015	52.1	32.7	15.2
Difference	-1.6	2.0	-0.4

In 2015, the educational attainment of women was lower than that of men as it is shown by the fact that women had a larger share of illiterate and a smaller share of the other educational levels (Graph 2.17b).

Graph 2.17b. WAP of male and female; percentage distribution by educational level in 2015 and gender differential



	< Intermediate	Intermediate	> Intermediate
Male	48.5	34.7	16.8
Female	55.8	30.6	13.6
Difference	7.3	-4.1	-3.2

However, between 2010 and 2015, the educational level of women in working age increased more than that of men and the gender differential declined (Table 2.19).

Table 2.19. Educational level; gender differential (2010–2015)

	< Intermediate	Intermediate	> Intermediate
2010	8.6	-5.1	-3.5
2015	7.3	-4.1	-3.2
2010–2015	-1.3	1.0	0.3

As it could have been expected, the people in the age group 30–49 have a higher educational level than those in the 50–64 age group. The first main age group (15–29) is not comparable since many of its members are still inside the educational system. However, it can be observed that between 2010 and 2015, the percentage of illiterate in this age group declined from 13.7 per cent to 8.7 per cent, a value that compares very favourably with the 26 per cent of the 30–49 age group (Table 2.20).

Table 2.20. WAP by sex and main age groups; percentage composition by educational level (2010 and 2015) and absolute changes between 2010 and 2015

	Illiterate			< Intermediate			Intermediate			> Intermediate			University			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
	2010																	
15–29	10.5	17.0	13.7	37.2	31.9	34.6	39.2	36.9	38.1	2.7	2.6	2.7	10.3	11.6	11.0	100.0	100.0	100.0
30–49	22.0	43.8	33.0	22.4	14.7	18.5	33.2	26.0	29.6	5.2	3.8	4.5	17.1	11.8	14.4	100.0	100.0	100.0
50–64	37.7	68.0	52.6	26.8	13.6	20.3	16.6	9.3	13.0	3.4	1.7	2.6	15.4	7.4	11.5	100.0	100.0	100.0
Total	**19.3**	**35.7**	**27.4**	**30.1**	**22.3**	**26.3**	**33.2**	**28.1**	**30.7**	**3.7**	**2.9**	**3.3**	**13.6**	**11.0**	**12.3**	**100.0**	**100.0**	**100.0**
	2015																	
15–29	6.5	11.0	8.7	42.2	39.3	40.8	38.6	36.9	37.8	2.3	2.1	2.2	10.4	10.6	10.5	100.0	100.0	100.0
30–49	16.6	35.6	26.0	25.5	16.9	21.2	36.4	30.7	33.6	5.6	3.6	4.6	16.0	13.3	14.6	100.0	100.0	100.0
50–64	32.3	62.2	46.6	27.7	16.0	22.1	21.0	12.3	16.9	3.8	1.7	2.8	15.2	7.8	11.7	100.0	100.0	100.0
Total	**14.6**	**28.1**	**21.2**	**34.0**	**27.7**	**30.9**	**34.7**	**30.6**	**32.7**	**3.7**	**2.5**	**3.1**	**13.2**	**11.1**	**12.1**	**100.0**	**100.0**	**100.0**
	2010–2015 (absolute change)																	
15–29	-4.0	-5.9	-4.9	4.9	7.5	6.1	-0.7	0.0	-0.3	-0.4	-0.5	-0.5	0.1	-1.0	-0.4	0.0	0.0	0.0
30–49	-5.5	-8.2	-6.9	3.0	2.2	2.7	3.2	4.6	3.9	0.4	-0.2	0.1	-1.1	1.5	0.2	0.0	0.0	0.0
50–64	-5.4	-5.8	-6.0	0.9	2.4	1.8	4.4	3.0	3.9	0.4	0.0	0.2	-0.3	0.4	0.2	0.0	0.0	0.0
Total	**-4.8**	**-7.6**	**-6.2**	**3.8**	**5.4**	**4.6**	**1.5**	**2.5**	**2.0**	**-0.1**	**-0.3**	**-0.2**	**-0.5**	**0.1**	**-0.2**	**0.0**	**0.0**	**0.0**

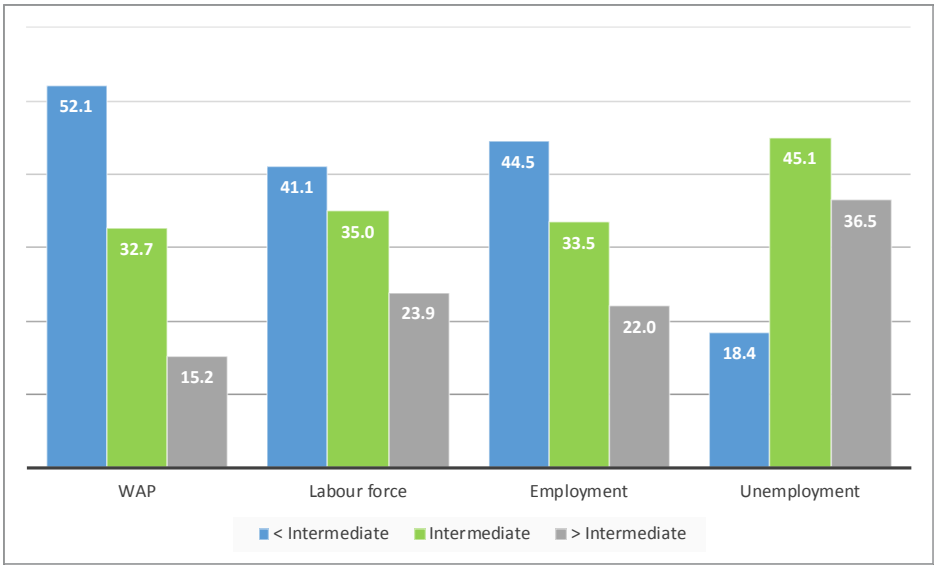
Labour force and employment. To capture the different educational attainment of the main labour market variables (WAP, labour force, employment and unemployment) and provide an easier way to compare them, only three educational levels will be considered: (a) less than intermediate; (b) intermediate; and (c) more than intermediate (Graph 2.19).

It is immediately evident (Graph 2.18) that the less educated subpopulation is WAP, while the subpopulation with the highest educational attainment is that of the unemployed. As what was just seen, more than 50 per cent of the WAP has not completed compulsory education, while this is true for only 18.4 per cent or the unemployed. At the same time, only 15.2 per cent of WAP have more than intermediate education while this is true for 36.5 of the unemployed. This situation implies that the members of the labour force have a higher educational level than the employed. A conclusion that is confirmed by the fact that the share of the employed with less than intermediate education is equal to 44.5 per cent versus 41.1 per cent of the members of the labour force, while the percentages of the employed with intermediate and more than intermediate education are higher.

From another perspective, it can be observed that:

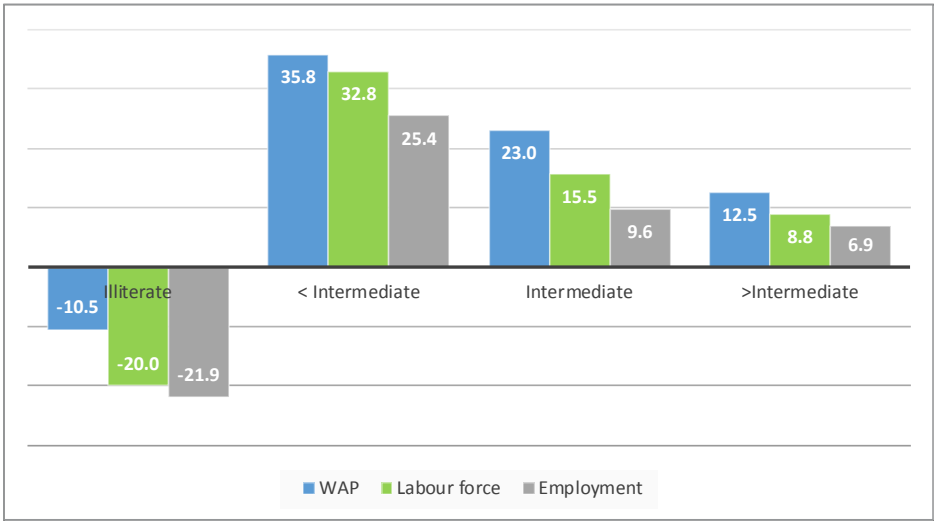
- The people with less than intermediate education are the largest group in WAP (52.1%) labour force (41.1%) and employment (44.5%); in the case of the unemployed the largest group is represented by the people with intermediate education (45.1%);
- The people with intermediate education represents 32.7 per cent of WAP, 35 per cent of the labour force, 33.5 per cent of the employed; and
- The people with high education represent 15.2 of WAP and are over-represented between the labour force (23.9%), the employed (22%), but especially the unemployed (36.5%).

Graph 2.18. Main labour market variables; percentage composition by educational level



Between 2010 and 2015, all the labour market variables being analysed register a decline of the illiterates and an increase of all the other educational groups (Graph 2.19). However, the notable increase in the educational level of WAP did only partially translate to the labour force and even less to the employed.

Graph 2.19. Main labour market variables; percentage change from 2010 to 2015



Coming to a more detailed analysis, it can be observed that between 2010 and 2015, the number of illiterates in the labour force registered a drastic decline from a little more of 6 million to 4.8 million (-20) (Table 2.21). As a consequence, the share of illiterates declined from 23.5 per cent to 17.3 per cent (Table 2.22). Similarly for employment, the number of illiterates declined by 21.9 per cent, and their share decreased from 25.6 per cent to 19.2 per cent. However, it must be underlined that in 2015, still almost one fifth of the employed could not read and write.

The percentage increase of the other components decreases with the level of education: from 25.3 per cent for those that can read and write but have not completed compulsory education, to 9.6 per cent for those with maximum compulsory education, to 7.9 per cent for those with more than compulsory education and 6.6 per cent for university graduates.

The same trend characterized also the labour force. However, in this case, the increase of the first two groups is more pronounced, and the same is true for the university graduates that increased by 10 per cent.

In conclusion, during the period under consideration, the average educational level of labour force and employment did not notably improve: if it is true that the percentage of illiterates declined, that of people with high education improved only slightly, a large increase being registered only by those with compulsory education as a maximum.

Unemployment, as what has been previously seen, increased by 55 per cent. All educational groups increased, with the exception of that with more than intermediate education (Table 2.25). More specifically, those with less than intermediate education increased by more than five times, and those with intermediate education increased around the average. As a consequence, in 2015, the unemployed with average education represented 45.1 per cent of the total, those with education above intermediate (including university graduates) 36.5 per cent and, in spite of the large percentage increase, those with less than intermediate education 18.5 per cent. Inside this group, it can be observed that the illiterate were only 4.4 per cent of total unemployment (Table 2.25).

Table 2.21. Labour force by sex, age group and educational level; absolute levels (2010 and 2015); absolute and percentage change between 2010 and 2015

	Illiterate			< Intermediate			Intermediate			> Intermediate			University			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
	2010																	
15–29	1,054	339	1,393	1,741	205	1,946	3,208	918	4,126	294	147	441	1,162	861	2,022	7,458	2,470	9,927
30–49	1,922	933	2,854	1,978	177	2,155	2,960	684	3,643	468	186	654	1,534	669	2,203	8,862	2,647	11,509
50–64	1,384	427	1,812	887	45	932	542	191	733	112	40	152	521	168	689	3,445	872	4,318
Total	**4,360**	**1,699**	**6,059**	**4,606**	**427**	**5,033**	**6,710**	**1,792**	**8,502**	**873**	**373**	**1,246**	**3,217**	**1,698**	**4,914**	**19,765**	**5,989**	**25,754**
	2015																	
15–29	788	275	1,063	2,276	713	2,989	3,295	1,160	4,454	273	139	412	1,305	964	2,269	7,937	3,250	11,186
30–49	1,531	618	2,149	2,376	194	2,570	3,457	781	4,238	536	148	684	1,533	804	2,337	9,434	2,544	11,978
50–64	1,343	291	1,634	1,075	52	1,127	846	285	1,131	154	45	199	594	206	800	4,011	879	4,891
Total	**3,662**	**1,184**	**4,846**	**5,727**	**958**	**6,685**	**7,597**	**2,225**	**9,823**	**963**	**332**	**1,295**	**3,432**	**1,974**	**5,406**	**21,382**	**6,673**	**28,055**
	2010–2015 (absolute change)																	
15–29	-266	-64	-329	535	507	1,043	87	242	329	-20	-8	-29	143	103	246	479	780	1,259
30–49	-391	-315	-705	398	17	415	497	97	595	68	-38	31	-1	135	134	572	-103	469
50–64	-41	-137	-178	188	7	195	304	94	398	42	5	47	73	38	111	566	7	573
Total	**-698**	**-515**	**-1,213**	**1,121**	**531**	**1,653**	**888**	**433**	**1,321**	**90**	**-41**	**49**	**215**	**276**	**491**	**1,617**	**684**	**2,301**
	2010–2015 (percentage change)																	
15–29	-25.2	-18.8	-23.6	30.7	247.1	53.6	2.7	26.4	8.0	-6.9	-5.7	-6.6	12.3	11.9	12.2	6.4	31.6	12.7
30–49	-20.3	-33.8	-24.7	20.1	9.6	19.3	16.8	14.2	16.3	14.6	-20.3	4.7	-0.1	20.2	6.1	6.5	-3.9	4.1
50–64	-3.0	-32.0	-9.8	21.2	14.9	20.9	56.1	49.1	54.2	37.4	12.4	31.0	14.1	22.7	16.2	16.4	0.8	13.3
Total	**-16.0**	**-30.3**	**-20.0**	**24.3**	**124.4**	**32.8**	**13.2**	**24.2**	**15.5**	**10.3**	**-11.0**	**3.9**	**6.7**	**16.3**	**10.0**	**8.2**	**11.4**	**8.9**

Table 2.22. Labour force by sex and main age group; percentage composition by educational level (2010 and 2015) and absolute changes between 2010 and 2015

	Illiterate			< Intermediate			Intermediate			> Intermediate			University			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
	2010																	
15–29	14.1	13.7	14.0	23.3	8.3	19.6	43.0	37.1	41.6	3.9	5.9	4.4	15.6	34.9	20.4	100.0	100.0	100.0
30–49	21.7	35.2	24.8	22.3	6.7	18.7	33.4	25.8	31.7	5.3	7.0	5.7	17.3	25.3	19.1	100.0	100.0	100.0
50–64	40.2	49.0	42.0	25.7	5.2	21.6	15.7	21.9	17.0	3.2	4.6	3.5	15.1	19.3	16.0	100.0	100.0	100.0
Total	**22.1**	**28.4**	**23.5**	**23.3**	**7.1**	**19.5**	**33.9**	**29.9**	**33.0**	**4.4**	**6.2**	**4.8**	**16.3**	**28.4**	**19.1**	**100.0**	**100.0**	**100.0**
	2015																	
15–29	9.9	8.5	9.5	28.7	21.9	26.7	41.5	35.7	39.8	3.4	4.3	3.7	16.4	29.7	20.3	100.0	100.0	100.0
30–49	16.2	24.3	17.9	25.2	7.6	21.5	36.6	30.7	35.4	5.7	5.8	5.7	16.2	31.6	19.5	100.0	100.0	100.0
50–64	33.5	33.1	33.4	26.8	5.9	23.0	21.1	32.4	23.1	3.8	5.2	4.1	14.8	23.5	16.4	100.0	100.0	100.0
Total	**17.1**	**17.7**	**17.3**	**26.8**	**14.4**	**23.8**	**35.5**	**33.3**	**35.0**	**4.5**	**5.0**	**4.6**	**16.0**	**29.6**	**19.3**	**100.0**	**100.0**	**100.0**
	2010–2015 (absolute change)																	
15–29	-4.2	-5.3	-4.5	5.3	13.6	7.1	-1.5	-1.5	-1.7	-0.5	-1.7	-0.8	0.9	-5.2	-0.1	0.0	0.0	0.0
30–49	-5.5	-10.9	-6.9	2.9	0.9	2.7	3.2	4.9	3.7	0.4	-1.2	0.0	-1.1	6.3	0.4	0.0	0.0	0.0
50–64	-6.7	-15.9	-8.6	1.1	0.7	1.5	5.4	10.5	6.1	0.6	0.5	0.6	-0.3	4.2	0.4	0.0	0.0	0.0
Total	**-4.9**	**-10.6**	**-6.3**	**3.5**	**7.2**	**4.3**	**1.6**	**3.4**	**2.0**	**0.1**	**-1.3**	**-0.2**	**-0.2**	**1.2**	**0.2**	**0.0**	**0.0**	**0.0**

Table 2.23. Employment by sex, age group and educational level; absolute levels (2010 and 2015) and absolute and percentage change between 2010 and 2015

	Illiterate			< Intermediate			Intermediate			> Intermediate			University			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
	2010																	
15–29	1,029	334	1,363	1,689	171	1,860	2,831	401	3,232	225	47	273	851	387	1,237	6,625	1,340	7,965
30–49	1,909	923	2,832	1,961	172	2,133	2,904	594	3,499	458	158	616	1,490	575	2,064	8,722	2,422	11,144
50–64	1,382	426	1,808	885	44	929	538	188	727	111	40	151	516	165	681	3,432	863	4,294
Total	**4,319**	**1,683**	**6,002**	**4,534**	**387**	**4,921**	**6,273**	**1,184**	**7,458**	**795**	**245**	**1,039**	**2,857**	**1,126**	**3,982**	**18,778**	**4,625**	**23,403**
	2015																	
15–29	687	246	933	1,932	637	2,570	2,518	641	3,159	214	68	283	856	470	1,327	6,207	2,063	8,271
30–49	1,516	615	2,131	2,312	183	2,495	3,364	545	3,909	521	121	642	1,469	662	2,131	9,182	2,126	11,308
50–64	1,333	290	1,623	1,056	51	1,107	835	275	1,110	153	44	197	584	204	788	3,960	864	4,824
Total	**3,536**	**1,151**	**4,687**	**5,300**	**872**	**6,171**	**6,717**	**1,461**	**8,177**	**888**	**233**	**1,122**	**2,909**	**1,337**	**4,246**	**19,349**	**5,053**	**24,403**
	2010–2015 (absolute change)																	
15–29	-342	-88	-430	243	466	710	-313	240	-73	-11	21	10	6	84	89	-418	723	306
30–49	-393	-308	-701	351	11	362	460	-50	410	63	-37	26	-21	88	67	460	-296	164
50–64	-48	-137	-185	171	7	178	297	86	383	41	4	46	68	40	108	529	1	530
Total	**-784**	**-533**	**-1,316**	**765**	**485**	**1,250**	**443**	**277**	**719**	**93**	**-11**	**82**	**53**	**211**	**264**	**571**	**428**	**1,000**
	2010–2015 (percentage change)																	
15–29	-33.3	-26.4	-31.6	14.4	272.8	38.2	-11.1	59.8	-2.3	-4.9	44.9	3.7	0.7	21.7	7.2	-6.3	54.0	3.8
30–49	-20.6	-33.4	-24.8	17.9	6.5	17.0	15.8	-8.4	11.7	13.7	-23.4	4.2	-1.4	15.2	3.2	5.3	-12.2	1.5
50–64	-3.5	-32.0	-10.2	19.4	15.8	19.2	55.1	45.8	52.7	37.1	11.1	30.5	13.2	24.1	15.8	15.4	0.1	12.3
Total	**-18.1**	**-31.6**	**-21.9**	**16.9**	**125.1**	**25.4**	**7.1**	**23.4**	**9.6**	**11.7**	**-4.7**	**7.9**	**1.8**	**18.7**	**6.6**	**3.0**	**9.3**	**4.3**

Table 2.24. Employment by sex and main age group, percentage composition by educational level (2010 and 2015) and absolute changes between 2010 and 2015

	Illiterate			< Intermediate			Intermediate			> Intermediate			University			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
	2010																	
15–29	15.5	24.9	17.1	25.5	12.8	23.4	42.7	30.0	40.6	3.4	3.5	3.4	12.8	28.8	15.5	100.0	100.0	100.0
30–49	21.9	38.1	25.4	22.5	7.1	19.1	33.3	24.5	31.4	5.3	6.5	5.5	17.1	23.7	18.5	100.0	100.0	100.0
50–64	40.3	49.4	42.1	25.8	5.1	21.6	15.7	21.8	16.9	3.2	4.6	3.5	15.0	19.1	15.8	100.0	100.0	100.0
Total	**23.0**	**36.4**	**25.6**	**24.1**	**8.4**	**21.0**	**33.4**	**25.6**	**31.9**	**4.2**	**5.3**	**4.4**	**15.2**	**24.3**	**17.0**	**100.0**	**100.0**	**100.0**
	2015																	
15–29	11.1	11.9	11.3	31.1	30.9	31.1	40.6	31.1	38.2	3.5	3.3	3.4	13.8	22.8	16.0	100.0	100.0	100.0
30–49	16.5	28.9	18.8	25.2	8.6	22.1	36.6	25.6	34.6	5.7	5.7	5.7	16.0	31.1	18.8	100.0	100.0	100.0
50–64	33.7	33.5	33.6	26.7	5.9	22.9	21.1	31.8	23.0	3.9	5.1	4.1	14.7	23.6	16.3	100.0	100.0	100.0
Total	**18.3**	**22.8**	**19.2**	**27.4**	**17.3**	**25.3**	**34.7**	**28.9**	**33.5**	**4.6**	**4.6**	**4.6**	**15.0**	**26.5**	**17.4**	**100.0**	**100.0**	**100.0**
	2010–2015 (absolute change)																	
15–29	-4.5	-13.0	-5.8	5.6	18.1	7.7	-2.2	1.1	-2.4	0.1	-0.2	0.0	1.0	-6.1	0.5	0.0	0.0	0.0
30–49	-5.4	-9.2	-6.6	2.7	1.5	2.9	3.3	1.1	3.2	0.4	-0.8	0.1	-1.1	7.4	0.3	0.0	0.0	0.0
50–64	-6.6	-15.8	-8.5	0.9	0.8	1.3	5.4	10.0	6.1	0.6	0.5	0.6	-0.3	4.6	0.5	0.0	0.0	0.0
Total	**-4.7**	**-13.6**	**-6.4**	**3.2**	**8.9**	**4.3**	**1.3**	**3.3**	**1.6**	**0.4**	**-0.7**	**0.2**	**-0.2**	**2.1**	**0.4**	**0.0**	**0.0**	**0.0**

Table 2.25. Unemployment by sex, age group and educational level, absolute levels (2010 and 2015) and absolute change between 2010 and 2015

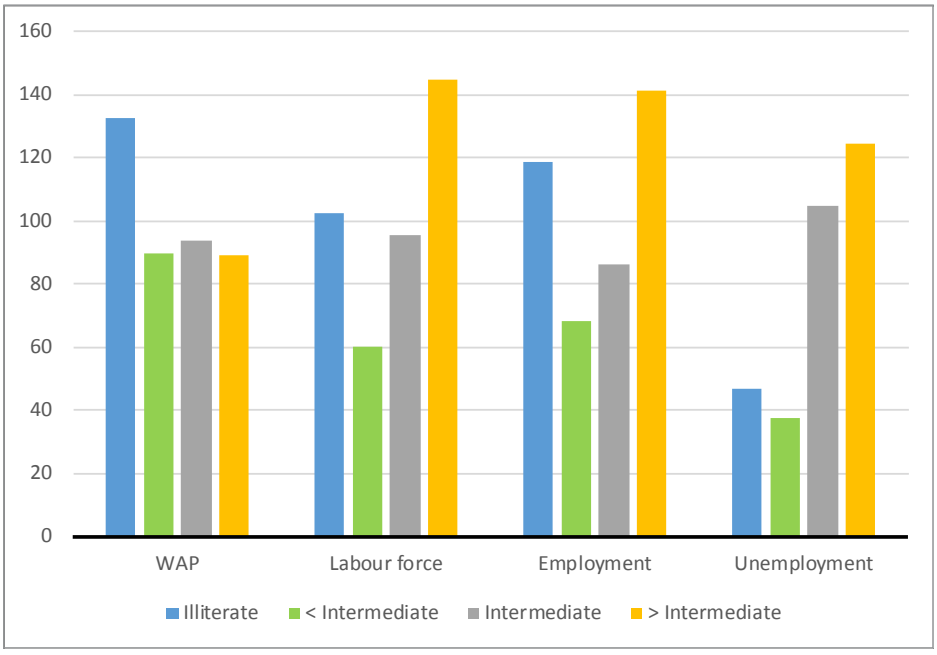
	Illiterate			< Intermediate			Intermediate			> Intermediate			University			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
	2010																	
15–29	25	5	30	52	34	86	377	516	893	68	100	168	311	475	785	833	1,130	1,963
30–49	13	9	23	18	4	22	55	89	144	10	28	38	45	94	139	140	225	365
50–64	3	1	4	3	1	3	4	3	6	1	1	1	5	4	9	14	9	23
Total	**40**	**16**	**56**	**72**	**40**	**111**	**436**	**608**	**1,044**	**79**	**128**	**207**	**360**	**572**	**932**	**987**	**1,364**	**2,351**
	2015																	
15–29	101	30	131	344	75	419	777	518	1,295	59	70	129	448	494	942	1,729	1,187	2,916
30–49	16	3	18	65	10	75	93	236	329	15	27	42	64	142	206	252	418	670
50–64	10	1	11	20	0	20	11	10	21	1	2	3	10	2	12	51	15	66
Total	**126**	**33**	**160**	**428**	**86**	**514**	**881**	**764**	**1,645**	**75**	**99**	**173**	**522**	**638**	**1,160**	**2,032**	**1,620**	**3,652**
	2010–2015 (absolute change)																	
15–29	76.7	24.3	100.8	291.9	41.0	332.8	399.6	2.3	401.9	-9.3	-29.6	-39.1	137.6	19.0	156.9	896.5	57.0	953.3
30–49	2.4	-6.7	-4.3	47.2	5.8	52.7	37.6	146.7	184.9	5.3	-0.8	4.6	19.3	47.7	67.1	111.8	192.7	305.0
50–64	6.9	-0.1	6.7	17.0	-0.3	17.0	7.3	7.5	14.7	0.5	0.6	1.1	5.3	-1.4	3.6	37.0	6.3	43.1
Total	**86.0**	**17.5**	**103.2**	**356.1**	**46.5**	**402.5**	**444.5**	**156.5**	**601.5**	**-3.5**	**-29.8**	**-33.4**	**162.2**	**65.3**	**227.6**	**1,045.3**	**256.0**	**1,301.4**
	2010–2015 (percentage change)																	
15–29	313.1	467.3	338.3	564.6	119.2	386.1	105.9	0.4	45.0	-13.6	-29.7	-23.3	44.3	4.0	20.0	107.7	5.0	48.6
30–49	18.2	-71.3	-18.9	269.7	131.8	238.5	67.9	164.6	128.4	54.1	-2.9	12.3	43.4	50.7	48.4	79.6	85.7	83.6
50–64	255.6	-10.0	176.3	680.0	-42.9	548.4	208.6	277.8	229.7	100.0	66.7	78.6	112.8	-38.9	42.4	266.2	70.8	185.8
Total	**212.9**	**112.2**	**183.3**	**496.7**	**117.7**	**361.3**	**101.9**	**25.7**	**57.6**	**-4.5**	**-23.2**	**-16.2**	**45.1**	**11.4**	**24.4**	**105.9**	**18.8**	**55.4**

Table 2.26. Unemployment by sex and main age group, percentage composition by educational level (2010 and 2015) and absolute changes between 2010 and 2015

	Illiterate			< Intermediate			Intermediate			> Intermediate			University			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
	2010																	
15–29	2.9	0.5	1.5	6.2	3.0	4.4	45.3	45.7	45.5	8.2	8.8	8.6	37.3	42.0	40.0	100.0	100.0	100.0
30–49	9.4	4.2	6.2	12.5	2.0	6.1	39.5	39.6	39.5	7.0	12.4	10.3	31.7	41.9	38.0	100.0	100.0	100.0
50–64	19.4	11.2	16.4	18.0	7.9	13.4	25.2	30.3	27.6	3.6	10.1	6.0	33.8	40.4	36.6	100.0	100.0	100.0
Total	**4.1**	**1.1**	**2.4**	**7.3**	**2.9**	**4.7**	**44.2**	**44.6**	**44.4**	**8.0**	**9.4**	**8.8**	**36.5**	**42.0**	**39.7**	**100.0**	**100.0**	**100.0**
	2015																	
15–29	5.9	2.5	4.5	19.9	6.4	14.4	44.9	43.7	44.4	3.4	5.9	4.4	25.9	41.6	32.3	100.0	100.0	100.0
30–49	6.2	0.6	2.7	25.7	2.4	11.2	36.9	56.5	49.1	6.0	6.5	6.3	25.3	34.0	30.7	100.0	100.0	100.0
50–64	18.9	5.9	15.8	38.3	2.6	30.3	21.2	67.1	31.8	2.0	9.9	3.8	19.6	14.5	18.3	100.0	100.0	100.0
Total	**6.2**	**2.0**	**4.4**	**21.1**	**5.3**	**14.1**	**43.3**	**47.2**	**45.1**	**3.7**	**6.1**	**4.7**	**25.7**	**39.4**	**31.8**	**100.0**	**100.0**	**100.0**
	2010–2015 (absolute change)																	
15–29	2.9	2.0	3.0	13.7	3.3	10.0	-0.4	-2.0	-1.1	-4.8	-2.9	-4.1	-11.4	-0.4	-7.7	0.0	0.0	0.0
30–49	-3.2	-3.5	-3.5	13.2	0.5	5.1	-2.6	16.8	9.6	-1.0	-5.9	-4.0	-6.4	-7.9	-7.3	0.0	0.0	0.0
50–64	-0.6	-5.3	-0.5	20.3	-5.2	17.0	-4.0	36.8	4.2	-1.6	-0.2	-2.3	-14.2	-26.0	-18.4	0.0	0.0	0.0
Total	**2.1**	**0.9**	**2.0**	**13.8**	**2.4**	**9.3**	**-0.9**	**2.6**	**0.6**	**-4.3**	**-3.3**	**-4.0**	**-10.8**	**-2.6**	**-7.9**	**0.0**	**0.0**	**0.0**

The distribution of women by educational level, in both the labour force and employment, presents a higher level of polarization, with women being over represented between the illiterate and the people with high education and under-represented between those with intermediate and below intermediate education.

Graph 2.20. WAP, labour force, employment and unemployment: Percentage of female in each educational level weighted by the average percentage in the variable (2015)



Educational levels by main age groups

As to be expected in a developing country like Egypt, school attendance has been progressively increasing, and this is reflected by an inverse relationship between educational level and age (Graph 2.21).

If WAP is to be considered, the percentage of people with less than compulsory education declines from 68.7 per cent for the 50–64 age group to 31.9 per cent for the 25–29 age group. At the same time, the percentage of people with intermediate education increases from 16.9 per cent for the old age group to 41.6 for the 25–29 age group, while for high education, the corresponding values are 14.5 per cent and 26.5 per cent.

The situation is similar for labour force and employment, but in these two subpopulations, the 25–29 age group register, with respect to WAP a lower percentage of people with low education (26.2% and 30.5% respectively) and a higher percentage of people with high education (20.4% for both).

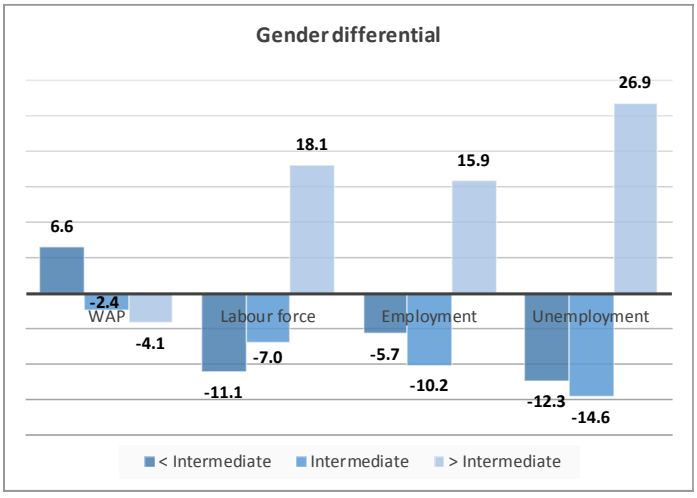
As already stressed, unemployment corresponds to the subpopulation with the highest educational attainment. This is especially true for the 25–29 age group, in which only 7.9 per cent of the unemployed have a low educational level and 52.7 per cent with high educational level.

Graph 2.21. Main labour market variables by main age group: percentage distribution by educational level (2015)

The increase in the educational level has affected both men and women, but the educational attainment of women remains lower also between the young. However, young women in the labour force, employment and unemployment have a much higher educational attainment than men.

Graph 2.22 reports the difference between the percentage of women and the percentage of men with the same educational attainment in WAP, labour force, employment and unemployment for the age group 25–29. In the WAP, the percentage of women with low education is higher than that of men, while the shares of intermediate and high education are lower. In conclusion, women still have a lower educational attainment than men. When labour force and employment are considered, the opposite situation with the percentage of women with high education exceeding the percentage of men with the same educational level is registered. The phenomenon is even more relevant in the case of unemployment, where the percentage of women with high education is 80.5 per cent and that of men is 53.6 per cent.

Graph 2.22. Educational levels; gender differential for WAP, labour force, employment and unemployment for the age group 25–29



The main labour market indicators by educational level

Numerous labour market studies have already pointed out that the presence in the labour market is positively related to educational attainment. At first glance, Egypt is no exception.

In 2015, the RoE of people with low education was equal to 34.9 per cent, to 43.7 per cent for people with intermediate education, and 61.4 per cent for people with high education. A partial exception to this perfect progression was the RoE of the illiterate that was equal to 38.5 per cent. A similar trend characterized also the specific rates of activity that were all higher than the corresponding RoE, the difference increasing with the educational level (Table 2.27).

Between 2010 and 2015, all specific RoA and RoE declined, the maximum difference being registered by the illiterates and those with intermediate education.

Table 2.27. Rate of employment by sex and educational attainment (2010 and 2015)

	2010			2015			Difference		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Illiterate	88.7	19.3	44.1	83.5	14.5	38.5	-5.2	-4.8	-5.6
< Intermediate	59.8	7.1	37.8	53.6	11.2	34.9	-6.2	4.1	-2.9
Intermediate	75.1	17.2	49.0	66.6	16.9	43.7	-8.5	-0.3	-5.3
> Intermediate	83.5	40.4	64.7	77.6	40.9	61.4	-5.9	0.5	-3.3
Total	**74.6**	**18.9**	**47.2**	**66.5**	**17.9**	**42.6**	**-8.1**	**-1.0**	**-4.6**

The simple analysis presented takes a different turn when the indicators are checked separately for men and women (Table 2.28). In the case of men, the highest RoE was in fact registered both in 2010 and 2015 by the illiterates with values above 86 per cent, while the RoA of illiterates ranked second after that of the people with high education. This was also the case for the RoE of illiterate women.

Table 2.28. Rate of activity by sex and educational attainment (2010 and 2015)

	2010			2015			Difference		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Illiterate	89.6	19.4	44.5	86.5	14.9	39.8	-3.1	-4.5	-4.7
< Intermediate	60.7	7.8	38.6	58.0	12.3	37.8	-2.8	4.4	-0.8
Intermediate	80.3	26.1	55.8	75.3	25.7	52.4	-5.0	-0.3	-3.4
> Intermediate	93.6	61.1	79.4	89.8	60.0	76.7	-3.8	-1.1	-2.7
Total	**78.5**	**24.5**	**51.9**	**73.5**	**23.6**	**48.9**	**-5.0**	**-0.9**	**-3.0**

As the previous analysis has already suggested, also the rates of unemployment are directly related to education, with unemployment being an almost marginal phenomenon for illiterates, but affecting 20 per cent of the members of the labour force with high education (Table 2.29). The range is wider for women than for men: for the former it ranges from 2.8 per cent to 31.9 per cent; for the latter from 3.5 per cent to 13.6 per cent.

Table 2.29. Rate of unemployment by sex and educational attainment (2010 and 2015)

	2010			2015			Difference		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Illiterate	0.9	0.9	0.9	3.5	2.8	3.3	2.5	1.9	2.4
< Intermediate	1.6	9.3	2.2	7.5	9.0	7.7	5.9	-0.3	5.5
Intermediate	6.5	33.9	12.3	11.6	34.4	16.8	5.1	0.4	4.5
> Intermediate	10.7	33.8	18.5	13.6	31.9	19.9	2.9	-1.9	1.4
Total	**5.0**	**22.8**	**9.1**	**9.5**	**24.3**	**13.0**	**4.5**	**1.5**	**3.9**

Flow analysis

In analogy with what is observed discussing the contribution of economic sector to labour demand, the generational flow approach allows estimating the structure of labour demand and supply by educational level and therefore to provide an answer to questions that have many relevant implications:

- Which levels of education are more requested by the production process?
- Is the structure of supply by educational level coherent with that of the demand?

To fully understand this point, it must be realized that the absolute changes in labour force and employment are the balance between generational entries and generational exits. Moreover, since the labour market is not characterized by a complete entry and exits flexibility, i.e. firms do not choose their employees "every morning", the structure of employment by educational level at a specific moment of time is the result of progressive marginal adjustments spanning over a very long period of time.

Therefore, if the type of people that the productive sector is demanding in a given time interval is to be understood, the generational entries by educational level have to be analysed first, while the educational structure of the mismatch between demand and supply can be estimated comparing generational entries into employment and generational entries into labour force by educational level (Table 2.30).

Table 2.30. Labour force and employment; generational entries, generational exits and generational balance by sex and educational level; values in thousands (2010–2015)

	Generational entries			Generational exits			Generational balance		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
	Labour force								
Illiterate	225	107	332	922	622	1,544	-698	-515	-1,213
< intermediate	1,458	582	2,009	336	51	356	1,121	531	1,653
Intermediate	1,497	582	2,028	609	149	707	888	433	1,321
> intermediate	1,034	638	1,621	729	403	1,081	305	235	540
Total	**4,212**	**1,908**	**5,989**	**2,596**	**1,224**	**3,688**	**1,617**	**684**	**2,301**
	Employment								
Illiterate	164	80	229	947	613	1,545	-784	-533	-1,316
< intermediate	1,135	535	1,632	369	50	382	765	485	1,250
Intermediate	1,010	421	1,428	567	145	709	443	277	719
> intermediate	775	396	1,149	629	196	803	146	200	346
Total	**3,084**	**1,432**	**4,438**	**2,512**	**1,004**	**3,438**	**571**	**428**	**1,000**

The data show that 39.1 per cent of the people hired between 2010 and 2015 had no formal education or less than intermediate education, 33.9 per cent had intermediate education and 27.1 per cent had higher education. It must also be underlined that around 5 per cent of the new employed were illiterate. This well illustrates the fact that a given subpopulation of the employed (but also any other labour market variables) can decline, but at the same register generational entries. Obviously, this is due to the fact that entries are paralleled by a greater number of exits. In this case, the illiterates that entered employment for the first time between 2010 and 2015 were 229,000, while exits amounted to 1.545 million.

Table 2.31. Generational entries into labour force and employment by sex; percentage distribution by educational level (2010–2015)

	Entries into labour force			Entries into employment		
	Male	Female	Total	Male	Female	Total
< Intermediate	42.1	42.9	41.9	39.9	36.1	39.1
Intermediate	32.8	29.4	32.2	35.5	30.5	33.9
> Intermediate	25.1	27.6	25.9	24.5	33.4	27.1

In the second place, the average educational level of generational entries is lower than that of additional demand. If only the educational structure of the change in employment is considered, it can be seen that 70 per cent of additional jobs required an intermediate education and 30 per cent high education. This can be very misleading because if the educational requirements of the productive system as indicated by the labour demand in terms of flow is considered, a totally different picture can be seen, as previous data have already illustrated.

A comparison of entries into labour force and employment (Table 2.31) shows that, in spite of the low percentage of people entering during the same period, WAP and labour force entries into the labour force exceeded those into employment for every educational level. If the percentage distribution is considered, a greater polarization of entries into labour force than into employment is observed, the only group registering a lower percentage being that with intermediate education.

Data confirm that the flow supply of women, as expressed by generational entries into labour force, is more polarized from a educational perspective than that of men, and the same is true for the demand. Moreover, the educational level of women that have entered into employment is notably higher than that of men, suffice to observe that 33.4 per cent of women had a high education level, versus 24.5 per cent of men.

As previously seen, between 2010 and 2015, the explicit excess of labour amounted to a little more than 1.5 million. By comparing entries into labour force to entries into employment, flow analysis allow the distribution of the increase in unemployment (the explicit excess of labour) by educational level. Aggregate values show that the most relevant group is that with intermediate education (39.2%), followed with very similar percentages by the group with low and with high education (respectively 30.6% and 30.2%). Also in this case, the data for men and women notably differ. In the case of men, the group most affected by the lack of demand is represented by people with a middle-low level of education, while in the case of women, the most affected are those with a middle-high level of education (Table 2.32). More specifically, 50.8 per cent of female excess labour had a high level of education and 33.8 per cent an intermediate level, while in the case of men, 43.7 per cent had an intermediate level and 28.3 a level below intermediate.

Table 2.32. Excess of labour by sex and educational level (2010–2015)

	Absolute value			Percentage composition		
	Male	Female	Total	Male	Female	Total
Illiterate	61	27	103	5.3	5.6	6.6
< Intermediate	323	47	376	28.3	9.8	24.0
Intermediate	498	161	613	43.7	33.8	39.2
> intermediate	259	243	473	22.7	50.8	30.2
Total	**1,140**	**478**	**1,564**	**100.0**	**100.0**	**100.0**

Part 3: The scenarios for the Egyptian labour market

The objective of this chapter is to jointly build demographic and labour market scenarios for Egypt, over the period 2015–2030, while those for a selected sample of European Union countries will be presented in a following chapter after the main findings about Egypt are summarized and an integrated set of policies strongly needed by the country is suggested. The scenarios are based on a series of hypotheses that will be spelled out as the paper moves through a three-step procedure.

In the first step, the scenarios are computed using a stock approach. This approach allows estimating the excess of labour supply in alternative hypotheses of labour demand and supply, and analysing their impact on the main labour market indicators.

The second step will identify the structure of the excess of labour supply by educational level. This step will be based on flow procedures and flow data.

The last and third step will consider the impact of migration on the main labour market variables and indicators. In this section of the paper, the full-fledged demographic scenarios in alternative assumptions of labour market participation, employment growth and net migration will also be estimated. These scenarios will provide a comprehensive picture of the role that migration can play in the future of Egypt, showing its impact on demographic trends.

THE STOCK APPROACH

Table 3.1 recalls that between 2010 and 2015, WAP increased by 15.5 per cent, labour force by 8.9 per cent and employment by 4.3 per cent. The result was a sharp contraction of the RoE that was paralleled by a less pronounced, but still relevant reduction of the RoA. It resulted also in an *explicit* excess of labour of 1.3 million and an increase in the RoU from 9.1 to 13 per cent.[10]

Table 3.1. Labour market variables and indicators (2010 and 2015)

	WAP	Labour force	Employment	Unemployment	RoA	RoE	RoU
2010	49,632	25,754	23,403	2,351	51.9	47.2	9.1
2015	57,343	28,055	24,403	3,652	48.9	42.6	13.0
Absolute change	7,711	2,301	1,000	1,301	-3.0	-4.6	3.9
% change	15.5	8.9	4.3	55.4	–	–	–

As is already known, Egypt is still in an initial phase of the demographic transition in which the generations of newborn are progressively increasing and the same tendency is clearly shown by the generations that are entering WAP. In the next 15 years, WAP will increase by 19 million, 3.5 million more than in the previous 15-year period,[11] while generational entries will progressively increase from 8.6 million in the first five-year period, to 9.5 million in the second, and to 12 million in the third, for a total value of around 30 million.

The impact of these demographic trends on the labour market will depend on the level of labour demand and the propensity to enter the labour force. In this section, it can be assumed that labour market participation is not influenced by labour demand. This has the scope to provide an extremely wide range of possible alternative scenarios. Table 3.2 spells out the hypotheses that will be used to build the scenarios.

Related to the labour force, three assumptions were made related to participation: (a) RoA remains constant at the 2015 level; (b) RoA increases by half percentage point every year; (c) RoA increases by 1 percentage point per year. Since men's participation is already quite high (73.5% in 2015), the increase in the total RoA is based on the idea that women's participation will increase as a consequence of the increase in their education level and the expansion of jobs, mainly in the service sector, deemed appropriate for women.

[10] It can be recalled that the explicit excess of labour supply over a given time interval is identified by the increase in unemployment registered in that period.

[11] The increase will be of 5.4 million between 2015 and 2020, 5.8 million between 2020 and 2025 and 7.8 million between 2025 and 2030.

On the demand side, it can be assumed that the first conservative hypothesis is a rate of growth of employment equal to the one registered in the previous five years, while two more optimistic scenarios are based on rates of growth of 7 per cent and 9.5 per cent, every five years.

Both the hypotheses on supply and demand are summarized in Table 3.2.

Table 3.2. Hypotheses on labour force participation and labour demand

	Labour force		Employment
A	The RoA will remain constant at the 2015 level of 48.9%.	1	Employment will grow at the same rate registered in the last five years (4.3%).
B	The RoA will increase by half percentage point every year.	2	Employment will grow at 7% over every five-year period.
C	The RoA will increase by 1 percentage point every year.	3	Employment will grow at 9.5% over every five-year period.

If the RoA will remain constant (Scenario A), labour force will grow from 28 million in 2015 to 37.4 million in 2030, purely as a consequence of the increase in WAP (that is projected to increase from 57.3 to 76.4 million); it will reach 43 million in Scenario B and 48.8 million in Scenario C due to the joint impact of the increase in WAP and in the RoA. For what relates to employment, in Scenario 1, employment increases by 3.3 million, in scenario 2 by almost 5.5 million and in scenario 3 by 7.6 million, which corresponds to average increases of 217,000, 366,000 and 509,000 jobs per year (Table 3.3).

Table 3.3. Labour force and employment in alternative scenarios (2015 and 2030)

	WAP	Labour force			Employment		
		A	B	C	1	2	3
2015	57,343	28,055	28,055	28,055	24,403	24,403	24,403
2020	62,771	30,710	32,280	33,849	25,445	26,111	26,721
2015–2020	5,428	2,656	4,225	5,794	1,042	1,708	2,318
2025	68,545	33,535	36,962	40,389	26,532	27,939	29,259
2020–2025	5,773	2,825	4,682	6,540	1,087	1,828	2,538
2030	76,360	37,358	43,085	48,812	27,665	29,894	32,039
Difference	**7,815**	**3,823**	**6,123**	**8,423**	**1,133**	**1,956**	**2,780**
2015–2030	19,017	9,304	15,031	20,758	3,262	5,492	7,636

Table 3.4 and Table 3.5 spell out the impact of these trends on the explicit excess of labour supply (computed as the difference between the increase in labour force and employment) and on the main labour market indicators. The total excess of labour, over the 15-year period, ranges between a minimum of 1.7 million in Scenario A3 (an "optimistic" scenario in which the rate of participation remains constant and employment increases at the yearly rate of 1.9%) and a maximum of 17.1 million in Scenario C1 in which labour force participation increases at the fastest rate considered in the exercise, while employment is projected to increase at the present rate of "only" 0.9 per cent per year. The yearly averages are therefore included in a very large interval spanning from 110,000 and 1.1 million. In Scenario B2, that can be considered as the central scenario and is also characterized by a parallel increase in employment and labour force, the yearly excess of labour is estimated in a little more than 750,000 people per year.

Table 3.4. Excess labour supply in nine alternative scenarios of participation and employment growth (2015–2030)

	A1	A2	A3	B1	B2	B3	C1	C2	C3
2015–2020	1,614	948	338	3,183	2,517	1,907	4,752	4,086	3,476
2020–2025	1,738	997	286	3,596	2,855	2,144	5,454	4,713	4,002
2025–2030	2,690	1,868	1,044	4,990	4,167	3,343	7,290	6,467	5,643
2015–2030 total	6,041	3,812	1,667	11,768	9,539	7,394	17,495	15,266	13,121
2015–2030 yearly	403	254	111	785	636	493	1,166	1,018	875

For what concerns the impact on the main labour market variables and indicators (Table 3.5), the most relevant result is that both unemployment and the RoU are projected to increase in all scenarios, the increase being positively related to the RoA and inversely related to employment growth. Moreover, it must be underlined that even under assumptions representing situations not too different from the existing ones, unemployment could reach levels that could bring to social unrest.

Table 3.5. Main labour market variables and indicators in 2020, 2025 and 2030 in nine alternative scenarios of participation and employment (GDP) growth

	A1	A2	A3	B1	B2	B3	C1	C2	C3
	2020								
WAP	62,771	62,771	62,771	62,771	62,771	62,771	62,771	62,771	62,771
Labour force	30,710	30,710	30,710	32,280	32,280	32,280	33,849	33,849	33,849
Employment	25,445	26,111	26,721	25,445	26,111	26,721	25,445	26,111	26,721
Unemployment	5,266	4,600	3,990	6,835	6,169	5,559	8,404	7,738	7,128
RoA	48.9	48.9	48.9	51.4	51.4	51.4	53.9	53.9	53.9
RoE	40.5	41.6	42.6	40.5	41.6	42.6	40.5	41.6	42.6
RoU	17.1	15.0	13.0	21.2	19.1	17.2	24.8	22.9	21.1
	2025								
WAP	68,545	68,545	68,545	68,545	68,545	68,545	68,545	68,545	68,545
Labour force	33,535	33,535	33,535	36,962	36,962	36,962	40,389	40,389	40,389
Employment	26,532	27,939	29,259	26,532	27,939	29,259	26,532	27,939	29,259
Unemployment	7,003	5,596	4,276	10,431	9,024	7,703	13,858	12,451	11,130
RoA	48.9	48.9	48.9	53.9	53.9	53.9	58.9	58.9	58.9
RoE	38.7	40.8	42.7	38.7	40.8	42.7	38.7	40.8	42.7
RoU	20.9	16.7	12.7	28.2	24.4	20.8	34.3	30.8	27.6
	2030								
WAP	76,360	76,360	76,360	76,360	76,360	76,360	76,360	76,360	76,360
Labour force	37,358	37,358	37,358	44,994	44,994	44,994	48,812	48,812	48,812
Employment	27,665	29,894	32,039	27,665	29,894	32,039	29	29,894	32,039
Unemployment	9,693	7,464	5,319	17,329	15,100	12,955	21,147	18,918	16,773
RoA	48.9	48.9	48.9	58.9	58.9	58.9	63.9	63.9	63.9
RoE	36.2	39.1	42.0	36.2	39.1	42.0	0.0	39.1	42.0
RoU	25.9	20.0	14.2	38.5	33.6	28.8	43.3	38.8	34.4

The excess of labour supply by educational level: The flow approach

To analyse the structure of excess labour supply by educational level, the entries into the labour force with entries into employment should be compared, both classified by educational level; in other worlds, the labour supply and labour demand in terms of flows by educational level should be compared. As already known, the labour demand in terms of flow is the result of two components: (a) replacement demand, which is equal to generational exits from employment; and (b) additional demand, which corresponds to the increase in the number of jobs. In this phase, it can be assumed that there is a zero migration balance; it can therefore be assumed, without loss of generality, that generational exits from employment in the period 2015–2030 will be equal to the number of employed in the age bracket 50–64 in 2015. For what concerns additional demand, the three assumptions made in the previous paragraph will continue to be adopted: (a) employment growth equal to 4.3 pr cent; (b) 7 per cent; and (c) 9.5 per cent in each five five-year period.

The previous analysis has shown that between 2010 and 2015, generational entries into labour force were equal to 46 per cent of entries into WAP. As already discussed, a desirable (although optimistic) upper limit for generational entries into labour force could be 70 per cent of the generational entries into working age. Such upper limit could correspond to approximately 90 per cent of men and 50 per cent of women entering WAP, entering also the labour market. An intermediate third scenario with entries into labour force equal to 58 per cent of entries into WAP will also be estimated.

Finally, different from what is done in the case of stock scenarios, it can be assumed that entries into labour force will be positively related to entries into employment, the implications being that each level of entries into employment will be linked to only one level of entries into labour force. Only three scenarios will therefore be examined: A1F, B2F and C3F, with capital letters A, B and C indicating the tree hypothesis on labour force entries, and 1, 2 and 3 the three levels of employment growth.

Once total generational entries into employment and labour force will be computed, specific hypothesis will then be needed to estimate entries by educational level. The definition of such hypotheses will have to take into consideration a series of elements.

In the first place, there is no sufficient data to estimate the trends of the structure of generational entries into labour force and employment by educational level. However, from the comparison of the educational level of different age groups,

it can be known that a slow improvement has been taking place. In the second place, it can be seen that between 2010 and 2015, the average educational level of generational entries into labour force was slightly higher than that of entries into employment. This confirms that, in spite of the demographic pressure on the education and training system, the new generations of children are succeeding in studying more than previous generations, but the labour demand in terms of flows, which reflects the needs of the production system, has not kept up with such improvements.

In order to get some indication of the marginal improvements in the structure by educational level of both the supply and demand of labour in terms of flow that could be expected in the 2015–2030 period, the following can be estimated:

(a) The structure by educational level of the first main age group (15–29) of both the labour force and employment; and
(b) Confronted it with that of the generational entries in the labour supply and in employment between 2010 and 2015.

Assuming that the former approximate the average educational structure of entries in the last 15 years, an estimate of the structure of generational entries during the next 15 years can be proposed as the algebraic sum of the percentage structure of labour force and employment and the difference between these values and the marginal values. The computation is spelled out in Table 3.6. The estimates reflect the previous considerations that the average educational level of the entries into the labour force is higher than that of the entries into employment and that the improvement in the educational level will continue, but at a rather modest pace.

Table 3.6. Estimates of the educational structure of entries in the labour force and employment between 2015 and 2030

	(A) Stock 15–29 in 2015	(B) Gen. entries (2010–2015)	C = A-B	B+C Gen. entries (2015–2030)
	Labour force			
< Intermediate	36.2	34.1	-2.1	32.0
Intermediate	39.8	37.0	-2.8	34.2
> Intermediate	24.0	28.9	4.9	33.8
	Employment			
< Intermediate	42.3	39.3	-3.1	36.2
Intermediate	38.2	37.1	-1.1	36.0
> Intermediate	19.5	23.6	4.2	27.8

Table 3.7 summarizes the total values of generational entries into the labour force and employment in each of the three flow scenarios A1F, B2F and C3F. The excess supply proposed by these scenarios present a range more limited than that of the stock scenarios, and included between a minimum of 400,000 and a maximum of 600,000 per year.

Table 3.7. Generational entries into labour force and employment and excess labour supply in alternative scenarios of labour force participation and employment growth (2015–2030)

	Generational exits	Additional entries			Total entries		
		A	B	C	A	B	C
Labour force	4,891	9,068	12,709	16,351	13,958	17,600	21,241
		1	2	3	1	2	3
Employment	4,824	3,262	5,492	7,636	8,087	10,316	12,461
					A1	A2	A3
Total excess labour supply					5,872	7,284	8,780
Yearly average					391	486	585

The previous hypotheses on the evolution of educational structure have then allowed to compute the structure by educational level of entries into labour force, employment and the excess supply in each of the three scenarios (Table 3.8). The first interesting and relevant result is that the expected average educational level of the excess supply is quite high, with more than 42 per cent of the people projected to constitute the excess supply having a high educational level and just around one fourth having a low educational level. In the second place, the level of employment and participation do not have a relevant impact on the educational structure of the excess supply.

Table 3.8. Generational entries into labour force and employment and excess labour supply by educational level in alternative scenarios (2015–2030)

	Generational entries		Excess supply		
	Labour force	Employment			
	15-year value	15-year value	15-year value	Average yearly value	% composition
	A1				
< Intermediate	4,465	2,929	1,536	102	26.2
Intermediate	4,769	2,909	1,861	124	31.7
> Intermediate	4,724	2,249	2,475	165	42.2
Total	**13,958**	**8,087**	**5,872**	**391**	**100.0**
	B2				
< Intermediate	5,630	3,736	1,894	126	26.0
Intermediate	6,014	3,711	2,303	154	31.6
> Intermediate	5,956	2,869	3,087	206	42.4
Total	**17,600**	**10,316**	**7,284**	**486**	**100.0**
	C3				
< Intermediate	6,795	4,513	2,282	152	26.0
Intermediate	7,258	4,482	2,775	185	31.6
> Intermediate	7,188	3,465	3,723	248	42.4
Total	**21,241**	**12,461**	**8,780**	**585**	**100.0**

The impact of different scenarios on the educational structure of labour force, employment and unemployment is then investigated. To do so, it was necessary to go through an intermediate step aimed to compute the structure by educational level of the balance between generational entries into and exits from, labour force and employment. As already indicated, the exits from labour force and employment were taken equal to the number of people in the 50–64 age group, as so was their educational structure. Table 3.9 reports the results of the computation. Since generational exits from labour force and employment are, as expected, extremely similar, the increase in unemployment and its structure by educational level do not notably differ from the excess supply and its structure.

Table 3.9. Generational entries into and exits from labour force and employment and change in unemploment by educational level in alternative scenarios (2015–2030)

	Generational entries		Generational exits		Generational balance		Change in unemployment	
	Labour force	Employment	Labour force	Employment	Labour force	Employment	Abs. value	% composition
	A1							
< Intermediate	4,465	2,929	2,761	2,730	1,705	199	1,506	25.9
Intermediate	4,769	2,909	1,131	1,110	3,639	1,799	1,839	31.7
> Intermediate	4,724	2,249	999	985	3,724	1,264	2,460	42.4
Total	**13,958**	**8,087**	**4,891**	**4,824**	**9,068**	**3,262**	**5,806**	**100.0**
	B2							
< Intermediate	5,630	3,736	2,761	2,730	2,869	1,006	1,863	25.8
Intermediate	6,014	3,711	1,131	1,110	4,883	2,601	2,282	31.6
> Intermediate	5,956	2,869	999	985	4,957	1,884	3,073	42.6
Total	**17,600**	**10,316**	**4,891**	**4,824**	**12,709**	**5,492**	**7,218**	**100.0**
	C3							
< Intermediate	6,795	4,513	2,761	2,730	4,034	1,783	2,251	25.8
Intermediate	7,258	4,482	1,131	1,110	6,127	3,373	2,754	31.6
> Intermediate	7,188	3,465	999	985	6,189	2,480	3,709	42.6
Total	**21,241**	**12,461**	**4,891**	**4,824**	**16,351**	**7,636**	**8,714**	**100.0**

What does, on the contrary, differ is the structure by educational level of the labour force and the employment balance (Table 3.10). The hypotheses keep the average level of education of the generational balance of the labour force higher than that of employment in all scenarios; at the same time, it determines a negative relationship between the average educational levels of both balances, and the increase of labour demand and supply. This result appears realistic once the expected demographic pressure on the educational system is kept in mind and the fact that a 15-year period is not sufficient to produce dramatic changes in the educational attainment of the people entering the labour market, a good share of which is already in school.

Table 3.10. Generational balances of labour force and employment in alternative scenarios for the period 2015–2030; percentage composition

	Generational balance					
	Labour force	Employment	Labour force	Employment	Labour force	Employment
	A1		B2		C3	
< Intermediate	18.8	6.1	22.6	18.3	24.7	23.4
Intermediate	40.1	55.2	38.4	47.4	37.5	44.2
> Intermediate	41.1	38.7	39.0	34.3	37.9	32.5

Finally, the structure of labour force, employment and unemployment in 2030 is estimated in the three scenarios and compared it with the situation in 2015 (Table 3.11). The educational level of both labour force and employment increases in all scenarios as a result of the reduction of the percentage of people with less than intermediate education and the increase of those with intermediate and high education. It must, however, be observed that the former group is projected to continue to weigh 40 per cent or just a little less, while the percentage of those with education above average remains short of 25 per cent. The level of education both of the labour force and employment is positively related to economic growth, but the average education of the latter remains lower. What is registered is therefore an increase of the percentage of people with low and high education, and a notable decline of that of people with intermediate education.

Table 3.11. Labour force, employment and unemployment in 2015 and in alternative scenarios in 2030, absolute values in thousands and percentage composition

	Labour force	Employment	Unemployment	Labour force	Employment	Unemployment
	2015					
< Intermediate	11,531	10,858	673	41.1	44.5	18.4
Intermediate	9,823	8,177	1,645	35.0	33.5	45.1
> Intermediate	6,701	5,367	1,333	23.9	22.0	36.5
Total	**28,055**	**24,403**	**3,652**	**100.0**	**100.0**	**100.0**
	2030					
	A1					
< Intermediate	13,236	11,057	2,179	35.7	40.0	23.0
Intermediate	13,461	9,977	3,485	36.3	36.1	36.8
> Intermediate	10,425	6,631	3,794	28.1	24.0	40.1
Total	**37,122**	**27,665**	**9,458**	**100.0**	**100.0**	**100.0**
	B2					
< Intermediate	14,401	11,864	2,537	35.3	39.7	23.3
Intermediate	14,706	10,779	3,927	36.1	36.1	36.1
> Intermediate	11,657	7,251	4,406	28.6	24.3	40.5
Total	**40,764**	**29,894**	**10,870**	**100.0**	**100.0**	**100.0**
	C3					
< Intermediate	15,566	12,641	2,925	35.1	39.5	23.6
Intermediate	15,950	11,550	4,400	35.9	36.1	35.6
> Intermediate	12,890	7,848	5,042	29.0	24.5	40.8
Total	**44,405**	**32,039**	**12,366**	**100.0**	**100.0**	**100.0**

Migration, labour market and demographic trends

The previous analysis has clearly shown that, in absence of emigration and even with a notable increase in the RoE growth, Egypt will continue to be affected by an extremely relevant excess of labour supply. Moreover, the excess of labour supply is projected to be directly linked to employment growth since it has been assumed that an increase in labour demand will produce a more than proportional increase in labour supply.[12] It is also seen that in absence of migration, the unemployment rate will grow to levels that could easily bring to social unrest especially because it will affect mainly the young people who have invested more in education. Emigration does therefore represent not an option, but an economic and social necessity. In this paragraph, its impact will be explored first on labour market variables and indicators, then on demographic trends. Also, this exercise will be based on a set of assumptions.

In addition to the zero migration scenario (M0) that have been already presented, three additional alternatives will be considered:

- A migration balance equal to one third of the additional excess of labour supply (Scenario M1);
- A migration balance equal to two thirds of the additional excess of labour supply (Scenario M2); and
- A migration balance equal to the additional excess of labour (Scenario M3).

For simplicity, but without loss of generality, it is also assumed that WAP and labour force will decline by an amount equal to the migration balance. Finally, the migration scenarios will be based on the flow scenarios that, in the author's opinion, cover a realistic range of changes in labour supply and labour demand.

Table 3.12 shows the impact of a negative migration balance on the main labour market variables and indicators, and more specifically:

- A reduction in the growth of WAP and labour force; in the case of WAP, the percentage growth declines from 33.2 per cent to 17.9 per cent in the scenario C3F, M3 in which the migration balance is equal to the excess supply of labour; the reduction of the labour force will be more relevant than that of WAP and therefore the RoA not only declines but the decrease is directly related to the size of the migration balance;

[12] This assumption is realistic in a situation of low RoE.

- The decline in WAP will cause an increase in the RoE that is directly related to the migration balance;
- Finally, the number of unemployed and the rate of unemployment and its reduction are positively related to the migration balance.

Table 3.12. Main labour market variables and indicators in 2015 and in 2030 in alternative scenarios of migration balance

		WAP	Labour force	Employment	Unemployment	RoA	RoE	RoU
		2015						
		57,343	28,055	24,403	3,652	48.9	42.6	13.0
		2030						
		A1						
A1F	No migration	76,360	37,122	27,665	9,457	48.6	36.2	25.5
	M1	74,402	35,165	27,665	7,500	47.3	37.2	21.3
	M2	72,445	33,208	27,665	5,543	45.8	38.2	16.7
	M3	70,488	31,251	27,665	3,586	44.3	39.2	11.5
B2f	No migration	76,360	40,764	29,894	10,870	53.4	39.1	26.7
	M1	73,932	38,336	29,894	8,442	51.9	40.4	22.0
	M2	71,504	35,908	29,894	6,014	50.2	41.8	16.7
	M3	69,076	33,480	29,894	3,586	48.5	43.3	10.7
C3F	No migration	76,360	44,405	32,039	12,366	58.2	42.0	27.8
	M1	73,433	41,478	32,039	9,439	56.5	43.6	22.8
	M2	70,506	38,661	32,039	6,622	54.8	45.4	17.1
	M3	67,579	35,625	32,039	3,586	52.7	47.4	10.1

SOME SUMMARY OBSERVATIONS ON THE DEMOGRAPHIC AND LABOUR MARKET TRENDS OF EGYPT

This part will sum up the most important elements that have emerged from the analysis.

Population explosion. Egypt is affected by what can be defined a veritable population explosion that has brought the number of inhabitants form around 21 million in 1950 to the present value of almost 93 million, that could become 200 million at the end of the century. At present, the fertility rate is up at 3.4 children per woman; the yearly number of births is 2.5 million (and will slightly increase up to 2045 when it is expected to peak at 2.7 million), while deaths are just above half a million so that total population is growing at almost 2 million per year (2%).

Population growth has been paralleled by an insufficient growth in employment. This has resulted in a relevant emigration phenomenon directed mainly to the United Arab Emirates, Saudi Arabia and Kuwait, but also to the United States. It is estimated that at present, around 7.5 million Egyptians live abroad, and of these, two thirds live and work in Arab countries, 18.4 per cent in North America and 10.7 per cent in European countries.

It should be acknowledged that demographic trends will play a central role in shaping the social and economic future of Egypt inasmuch as they will originate two extremely difficult and strictly interrelated challenges for the Government of Egypt. The first is related to the education system, the second to the labour market.

The Egyptian population is very young, one third being below 15 years of age. It can also be estimated that in the next 15 years, children in compulsory education age and the potential high school and university students will increase by more than 15 per cent, while it is foreseeable and desirable that the rate of enrollment will increase; at the same time, in absence of migration, WAP will grow by 33.9 per cent and generational entries will remain largely above 2 million. To fully understand the implications of these data, the main characteristics and tendencies of the Egyptian labour market have to be analysed.

Insufficient employment growth. Between 2010 and 2015, employment grew at the average yearly rate of 0.9 per cent, which corresponds to 200,000 additional jobs per year. If such performance could be considered normal or even good for a developed economy with a stable WAP, it was dramatically insufficient in a situation in which WAP grew by 3.1 per cent per year. Although evident discouragement effects contained the rate of growth of the labour force to 1.8 per cent, unemployment climbed to a historical maximum of almost 3.7 million.

The dismal situation affecting Egypt can be summarized by recalling that between 2010 and 2015, only 46 per cent of the young people that entered WAP entered also into the formal labour market, and only 33.4 per cent found a job. This very poor performance resulted in the fact that in 2015, out of 100 people in WAP, only 49 were in the labour force and only 42 had a job.

The growth in labour demand has been based only on traditional sectors. The increase in the employment level registered between 2010 and 2015 is the result of a decline in the two main productive sectors – agriculture and industry (mainly manufacturing) – and of an increase in construction and especially in services where almost all the expansion came from transport, trade, health, education and accommodation. By now, 49.1 per cent of the employed work in the service sector, 25.8 per cent in agriculture, 13 per cent in industry, and 12.1 per cent in construction.

Flow analysis has shown that services played the major role in absorbing the young people exiting the education and vocational training system accounting for 51.1 per cent of the total labour demand in terms of flow, followed by agriculture with 27.9 per cent, construction (12.8%) and industry with only 8.2 per cent (Table 2.15). The share of women in total entries was just below one third. At a less aggregate level, the major role was played by transportation and trade, with shares of 11.4 per cent and 10.6 per cent, followed by manufacturing that with a share of 6.7 per cent precedes education and health.

In conclusion, not only the growth in employment was largely insufficient, but came from traditional sectors, with low technological content, the employment in modern sectors like IT, financial activities, professional and administrative professions registering negative or marginal variations.

Extremely low presence of women in the labour market. The low level of the labour demand, together with the social values still largely shared by the Egyptian society, keep the presence of women in the formal labour market extremely limited. In spite of some improvements registered in recent years, only one third of entries into employment were accounted for by women, and by now women represent only 24 per cent of the labour force, and 21 per cent of employment, while they constitute 44 per cent of the unemployed.

It should be noted that the level of women's employment grew in all main sectors and women employment growth was especially relevant in services (+14.9%). However, women's presence remains concentrated in agriculture and services that account respectively for 40.1 per cent and 54.2 per cent of the total number of women employed.[13]

The young are the most hit by the insufficient level of the labour demand. The age structure of the sex-specific labour market indicators well capture the relative strength of different socioeconomic groups.

Reflecting their socially recognized role of main breadwinner, the RoE and RoA of men present the classical box-shape structure with steeply inclined sizes for the first and last age groups and a flat top with values above 90 per cent for the age groups between 30 and 55. This socially accepted role does also imply that the men with a family to sustain have job priorities over younger non-married men. Coherently with these assumptions, the relative lack of labour demand registered in the last five years has affected mainly the men in the first age groups so that their rates of employment have declined and their presence in unemployment has largely increased.

Between 2010 and 2015, the shape of women's age-specific rates of activity and employment radically changed so that by 2015, also women-specific rates of employment (and of activity) present a box-shape form, but with maximum values below 25 per cent.

Flow data show that generational exits begin with the 30–34 age group. This suggests relevant migration flows for men, while for women, this phenomenon could be due to the decision to take care of their children, a tendency that could have been fostered by the insufficient level of labour demand, as well by the ongoing process of urbanization and its impact on the family structure.

[13] It can be recalled that women's employment grew more than men's employment (9.3% versus 3.0%) and women took 42.8 per cent of additional jobs.

One of the most relevant elements shown by the age group analysis is that the relative lack of labour demand registered in the last five years has affected mainly the first age groups, causing an increasing concentration of unemployment between the young: in fact, while in 2015 the 15–29 age group weights 39.3 per cent in the case of the labour force, and 33.4 per cent for the employed, it weights 79.8 for the unemployed. At the same time, the 30–49 age group weighs 42.1 per cent for the labour force, 45.6 per cent for the employees and only 18.3 per cent for the unemployed.

The educational level is low, and improvements in recent years have been very limited. The educational level of the Egyptian people in working age is quite low, and the improvements in recent years have been very modest. Despite the decline of the number of illiterate, more than half of the Egyptian population in working age has not completed compulsory education, and only 15.2 per cent has a high educational level, and the educational attainment of women is lower than that of men.

The average educational level of employed people is higher than that of WAP but lower than that of labour force; the most educated group is however constituted by the unemployed. More than 40 per cent of the people hired, between 2010 and 2015, had less than intermediate education, 32 per cent an intermediate education and 26 per cent a higher education; entries into the labour force exceeded those into employment for every educational level, showing at the same time a greater education polarization, the only group registering a lower percentage being that of people with intermediate education.

It must also be underlined that around 5 per cent of the new employed were illiterate. This immediately suggests that unemployment not only affects mainly young people, but especially young people with high educational level. It can be recalled that in 2015, against a total RoU of 13 per cent, the unemployment rate for the 15–19 age group was equal to 23 per cent and 34.7 per cent for the 20–24 age group; moreover, it was 19.9 per cent for the people with high education and only 3.3 per cent for the illiterate.

The excess of labour will remain a structural characteristic of the Egyptian labour market even in the most positive development of the Egyptian economy. Between 2010 and 2015, unemployment increased by around 260,000 per year, of which 30.2 per cent with high education and 39.2 per cent with intermediate education. However, in this period, the very low RoAF clearly signals the presence of large phenomena of discouragement. Therefore, it would be reductive to identify the increase in unemployment, the *explicit* excess of labour,

with the structural excess of labour of the period. Different hypotheses on the potential supply of labour brought to estimates of the structural excess of labour for the period 2010–2015, from two to four times as much as the increase in unemployment.

The scenarios have confirmed that this situation will continue over the next 15 years. The hypotheses on the RoA and employment growth on which the stock scenarios have been built, and the assumption of independence between labour demand and supply, have brought to obtain a very large range of estimates of excess of labour. They are included between an average yearly value of 110,000, in the extremely optimistic situation in which the RoA would remain constant at the 2015 value and employment will grow at 1.9 per cent per year, to 1.1 million in the he extremely pessimistic situation in which the RoA will grow by 1 percentage point per year, while employment will continue to grow at 0.9 per cent per year. Therefore, unemployment increases in all scenarios up to values that could bring to social unrest.

The flow scenarios are based on the same hypothesis on employment growth, but the hypotheses on labour supply are defined in terms of the RoAF, i.e. the percentage of generational entries into labour force with respect to entries into WAP. Moreover, and more importantly, for the computation of the excess of labour supply, it can be assumed that more realistically, there is a direct relationship between the supply and the demand of labour. As a consequence, only three scenarios are computed and the estimates of the excess of labour supply present a more limited range, between 400,000 and 600,000. These values, probably more politically correct, do however underestimate the real value because these do not consider the behaviour of the people already in working age at the beginning of the period. Comparing estimated entries into the labour force and into employment allowed estimating that the excess supply of labour will be composed by around 42 per cent of people with high education, 32 per cent with intermediate education, and only 26 per cent with low education. It is, however important to understand that these estimates are made under a *ceteris paribus* assumption, which implies that they could be at least partially modified by development policies aimed to modernize the process of production and improve productivity and that will raise the demand for the educated and the highly educated.

POLICY SUGGESTIONS

To promote a fast decline in fertility rate is an immediate necessity. The first clear policy indication that can be derived from the previous analysis is that policies aimed to reduce fertility should be strengthened. It is still a widespread opinion that children are an investment as they represent a form of insurance against old-age poverty. If this vision could have a limited validity in an agrarian society, it certainly does not apply to a developing economy in which agrarian employment declines and where demographic growth drastically reduces the probability to find a decent job, and therefore the possibility to sustain even a small family. Data show that after 2011, the total rate of fertility has climbed again towards 3.5 children per woman, probably due to the reduction in family planning measures and financing that has taken place after 2011. If this information is extremely negative for its implication on the future demographic trends of the country, at the same time, seems to suggest that family planning measures can have a notable impact on people's behaviour.

Sustained economic growth is a top priority. In order to keep the present already extremely low RoE constant, in the next 15 years, the level of employment would have to grow at an average rate of more than 2 per cent per year, a rate double the one registered between 2010 and 2015. The average GDP rate of growth registered in the same period has been equal to 2.1 per cent. Therefore, just to keep its RoE constant at the present level, Egypt needs to bring its rate of economic growth close to 5 per cent or even higher. However, it must be underlined that in such a scenario, unemployment would certainly grow, while a rate of technological innovations more suited to the present needs of the Egyptian economy would imply an employment-income elasticity lower than that used for the previous estimate of requested GDP growth.

A process of industrial restructuring must be put immediately under way. Due to the sustained population growth that will inevitably affect Egypt for quite a long time, the agricultural sector must not only continue to play a key role, but should become the origin of an integrated agro-food sector that will bring food production close to the place of origin of the raw materials. Obviously, an extension of cultivated land will also be required. Egypt must also strive to revive the traditional sectors like textile, while maintaining alive the traditions of a rich handcrafted production. Special attention should be devoted to tourism also through a well-aimed communication policy based on a renewed image of the country. However, the most necessary step will be that of progressively shifting the engine of economic and employment growth from traditional sectors to productive clusters with higher technological and knowledge content.

This is also required by the forecast increase in the educational level of labour supply. However, it is also possible that the increase in technological content of production will determine a polarization of the educational content of labour demand.

Women labour market participation must be increased. Enlarging the presence of women in the labour market is not only a question of social equity. The distribution of potentialities is the same for men and women, and an unequal participation to the labour market does negatively affect productivity. It is therefore in the general interest of the economic system to reach a more balanced distribution of jobs between men and women.

Improving the educational level cannot be postponed. It is evident that education represents a key factor not only to sustain the social and economic development of the country, but also because an increasing number of countries will need foreign labour with a high level of education. At the same time, it is evident that the demographic trends and the geographical structure of Egypt will make extremely difficult, if not impossible, to make the necessary investment if only standard educational procedure will be considered. Immediate attention should therefore be given to distance learning in all its possibilities.

Emigration is not an option but a necessity. The scenarios have clearly shown that it will be basically impossible for Egypt to reach an economic growth sufficient to face demographic growth and bring the employment rate to a more acceptable level. In this situation, emigration will be a necessity.

In the next chapter, scenarios for the the four biggest European Union countries will be built. This will allow to provide estimates of the needs of foreign labour of these countries by educational level, and compare it with the excess of labour supply that characterizes Egypt.

This will bring to suggest in the final chapter of this report that these complementary situations should be sufficient to realize that there is only one rational solution for both groups of countries: to sit together, plan and manage migration flows to satisfy, on the one hand, the need, of Egypt and other countries to export their structural excess of labour and, on the other, the need of European Union countries, to import the amount and typology of labour lacking to their production system.

European Union countries' scenarios

One of the goals (possibly the main goal) of the first part of this paper was to estimate the excess of labour supply that could affect Egypt between 2015 and 2030 in alternative scenarios of employment growth and labour force participation and assess the impact of a negative migration balance on the main labour market variables and demographic trends.

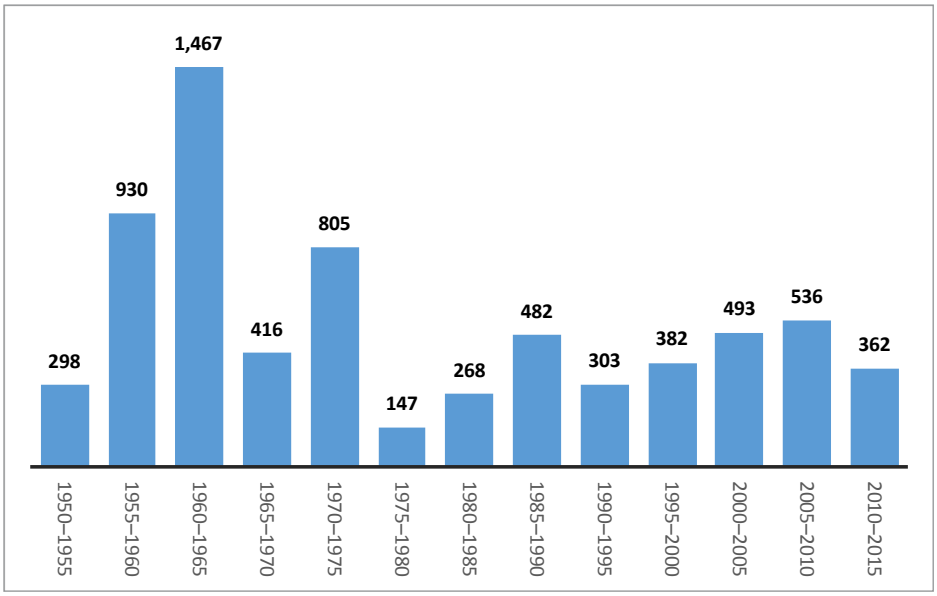
Based on the main empirical evidences emerged from the analysis, this paper also suggests a comprehensive set of demographic, labour market and economic policies. It is however, concluded that even the efficient implementation of these policies could not change the fact that for Egypt, relevant emigration flows will not represent an option but a necessity if the Government wants to avoid a situation of increasing unemployment, misery and social unrest.

This part of the paper will document that European Union countries will be affected by a parallel and opposite problem – a structural decline of WAP.

FRANCE

France has been an immigration country since the the beginning of the 1950s, the migration balance clearly showing a strong cyclical behaviour (Graph F1). Therefore, it can safely be expected that France will continue to need foreign labour to allow economic growth and sustain social development.

Graph F1. Migration balance; five-year values in thousands (1950–1955 to 2010–2015)



The labour market: A background analysis

Stock analysis. In France, from 2000 to 2015, employment increased by 3.1 million (+13.4%), labour force by 3.5 million (13.7%) and therefore unemployment did expand by a little more than 400,000 (+15.7%) and passed the 3 million mark (Table F1). Finally, WAP grew by 3.6 million (+9.7%).

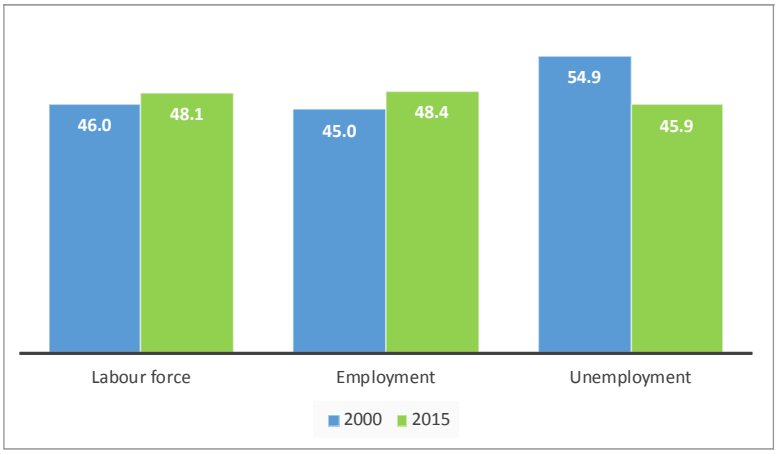
Table F1. Main labour variables by sex; total and by educational level (2000 and 2015); absolute and percentage change from 2000 to 2015

		2000			2015			2000–2015					
		Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
		Absolute values						Absolute change			Percentage change		
All levels	WAP	18,415	18,902	37,317	20,083	20,844	40,927	1,668	1,942	3,610	9.1	10.3	9.7
	Labour force	13,853	11,808	25,660	15,127	14,037	29,164	1,275	2,229	3,504	9.2	18.9	13.7
	Employment	12,665	10,364	23,029	13,478	12,640	26,119	813	2,276	3,090	6.4	22.0	13.4
	Unemployment	1,187	1,444	2,631	1,649	1,397	3,045	461	-48	414	38.9	-3.3	15.7
ISCED 0–2	WAP	7,033	7,927	14,960	5,157	5,441	10,598	-1,876	-2,485	-4,361	-26.7	-31.4	-29.2
	Labour force	4,380	3,766	8,146	2,814	2,509	5,323	-1,566	-1,257	-2,823	-35.8	-33.4	-34.7
	Employment	3,792	3,100	6,892	2,278	1,935	4,213	-1,514	-1,165	-2,679	-39.9	-37.6	-38.9
	Unemployment	588	666	1,254	536	574	1,110	-52	-92	-144	-8.9	-13.8	-11.5
ISCED 3–4	WAP	7,878	7,060	14,938	9,254	8,521	17,775	1,376	1,461	2,837	17.5	20.7	19.0
	Labour force	6,430	4,913	11,343	7,216	5,930	13,146	786	1,017	1,803	12.2	20.7	15.9
	Employment	5,981	4,328	10,310	6,448	5,270	11,718	467	942	1,409	7.8	21.8	13.7
	Unemployment	449	585	1,034	768	660	1,428	319	75	394	71.1	12.9	38.2
ISCED 5–8	WAP	3,489	3,902	7,391	5,594	6,810	12,404	2,104	2,908	5,013	60.3	74.5	67.8
	Labour force	3,041	3,129	6,170	5,041	5,747	10,788	2,000	2,619	4,619	65.8	83.7	74.9
	Employment	2,891	2,936	5,827	4,708	5,397	10,105	1,817	2,461	4,278	62.9	83.8	73.4
	Unemployment	150	193	343	333	351	684	183	158	341	121.9	81.8	99.3

Note: ISCED – International Standard Classification of Education

The dynamic of the female component has been much more pronounced than that of men, with women's labour force and employment increasing at around the same amount (little more than 2.2 million), while the number of unemployed women slightly declined (-47,000). On the other side, men's employment increased less than the labour force. As a consequence: (a) the percentage of women in labour force and employment has notably increased getting close to parity with men; (b) the increase in unemployment affected only men; so that (c) the percentage of women in unemployment declined (Graph F2).

Graph F2. Labour force, employment and unemployment: Percentage of female; 2000 and 2015



The result of the previous trends was an increase of the RoA of 2.5 percentage points, of the RoE of 2.1 points, and of the RoU of 0.2 percentage points. Also, the main labour market indicators clearly show the different trends of women and men variables. In the case of women, the RoA and the RoE increased respectively by 4.9 and 5.8 percentage points, while the RoU declined by 2.3 percentage points; in the case of men, the RoE declined by 1.7 percentage points, the RoA increased by 0.1 percentage points and the RoU by 2.3 percentage points (Table F2). Therefore, all gender differentials declined: in 2015, men RoA and RoE exceeded those of women by only 5.7 and 5 percentage points respectively, while the RoU of women (that in 2010 was higher than that of men), in 2015 was slightly lower (9.9% versus 10.9%).

Table F2. Main labour indicators by sex and educational level (2000 and 2015) and absolute change from 2000 to 2015

		2000			2015			2000–2015		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
All levels	RoA	75.2	62.5	68.8	75.3	67.3	71.3	0.1	4.9	2.5
	RoE	68.8	54.8	61.7	67.1	60.6	63.8	-1.7	5.8	2.1
	RoU	8.6	12.2	10.3	10.9	9.9	10.4	2.3	-2.3	0.2
ISCED 0–2	RoA	62.3	47.5	54.5	54.6	46.1	50.2	-7.7	-1.4	-4.2
	RoE	53.9	39.1	46.1	44.2	35.6	39.7	-9.7	-3.5	-6.3
	RoU	13.4	17.7	15.4	19.0	22.9	20.9	5.6	5.2	5.5
ISCED 3–4	RoA	81.6	69.6	75.9	78.0	69.6	74.0	-3.6	0.0	-2.0
	RoE	75.9	61.3	69.0	69.7	61.8	65.9	-6.2	0.5	-3.1
	RoU	7.0	11.9	9.1	10.6	11.1	10.9	3.7	-0.8	1.7
ISCED 5–8	RoA	87.2	80.2	83.5	90.1	84.4	87.0	3.0	4.2	3.5
	RoE	82.9	75.2	78.8	84.2	79.2	81.5	1.3	4.0	2.6
	RoU	4.9	6.2	5.6	6.6	6.1	6.3	1.7	-0.1	0.8

Another very relevant trend registered in this period is the improvement in the educational level of the people in working age, labour force and employment. Starting from the demand side, the increase in the employment level was the result, on the one hand, of the decrease of 2.7 million people with low education (-38.9%), and on the other hand, of the increase of 1.4 million people with intermediate educational level (13.7%), but especially of 4.3 million with high education (73.5%). Very similar trends characterized the labour force.

Therefore, in 2015, 38.8 per cent of the employed and 36.9 per cent of the labour force had high educational levels, with WAP registering a lower percentage of 30.4 per cent. On the other hand, the percentage of people with low education in employment and labour force had declined to 16.2 per cent and 18.2 per cent, respectively. In this case, the percentage in WAP was higher: 26 per cent. The intermediate education level, with share of around 44–45 per cent, remains the largest component in WAP, labour force and employment (Table F3).

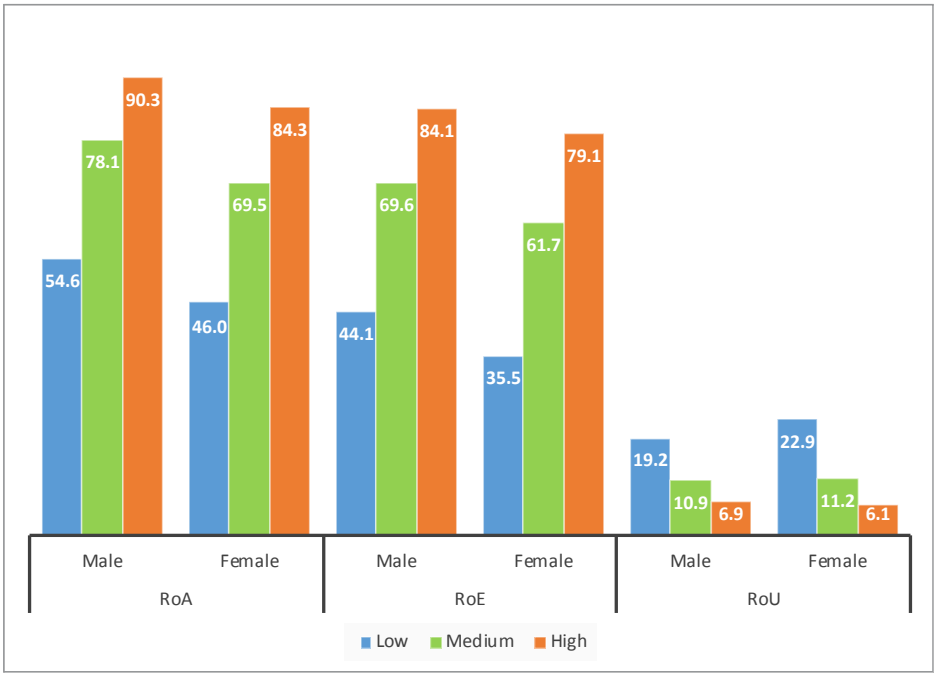
Table F3. Main economic variables; percentage composition by sex and educational level (2010 and 2015) and change between 2010 and 2015

	2000			2015			2000–2015		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
	WAP								
Low	38.2	42.0	40.1	25.8	26.2	26.0	-12.4	-15.8	-14.1
Medium	42.8	37.4	40.1	46.3	41.0	43.6	3.4	3.6	3.5
High	19.0	20.7	19.8	28.0	32.8	30.4	9.0	12.1	10.6
	Labour force								
Low	31.6	31.9	31.7	18.7	17.7	18.2	-13.0	-14.2	-13.6
Medium	46.4	41.6	44.2	47.9	41.8	44.9	1.5	0.2	0.7
High	22.0	26.5	24.0	33.4	40.5	36.9	11.5	14.0	12.8
	Employment								
Low	29.9	29.9	29.9	17.0	15.4	16.2	-13.0	-14.6	-13.7
Medium	47.2	41.8	44.8	48.0	41.8	45.0	0.8	0.1	0.2
High	22.8	28.3	25.3	35.0	42.8	38.8	12.2	14.5	13.5
	Unemployment								
Low	49.6	46.1	47.7	32.8	36.2	34.5	-16.8	-9.9	-13.2
Medium	37.8	40.5	39.3	46.9	41.6	44.3	9.1	1.1	5.0
High	12.6	13.4	13.0	20.3	22.1	21.2	7.7	8.8	8.2

Regarding unemployment, a few observations are in order. In the first place, in 2000, the unemployed with low educational level were almost half of the total (47.7%), followed by those with an intermediate educational level (39.3%), while only 13 per cent of the unemployed had high education level. As already seen, in the following 15 years, the average level of education increased in all labour market related sub-populations and unemployment was not an exception. The increase in the stock of unemployed was the result of a decline of those with low education and an increase of those with intermediate and high education. As a consequence, the share of the first group lost 13.2 percentage points and declined to 34.5 per cent, while the shares of the other two groups increased respectively to 44.3 per cent and 21.2 per cent.

The main indicators by educational level confirm two well-known aspects of labour force participation: (a) the education-specific rates of activity and employment are positively related to educational level; and (b) the range of women's rates is wider than that of men, which means education makes a difference especially for women.

Graph F3. Main economic indicators by sex and educational level (2015)



As shown by Graph F3, men's rates of participation range from 54.6 per cent to 90.3 per cent and those of women from 46.0 per cent to 84.3 per cent so that the gender differential is inversely related to education, declining from 8.6 to 6.0 percentage points.

The RoUs present, on the contrary, an inverse relationship with education, ranging from 19.2 per cent for men with low education to 6.9 per cent for men with high education and from 22.9 per cent to 6.1 per cent for women. This could be interpreted as confirming that education makes a difference, and it pays to study. These data can be interpreted as showing that people with high education are becoming the relatively more scarce resource.

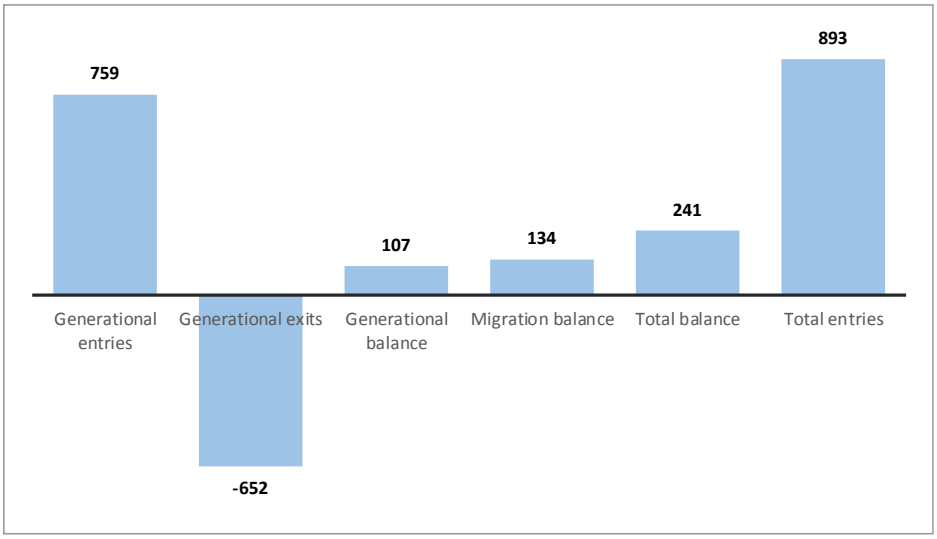
Generational flow analysis. Between 2000 and 2015, WAP has been affected by a natural increase of 1.6 million and by a positive migration balance that is estimated at 2.0 million. Taking into consideration natural entries and the migration balance, total entries into WAP amount to around 13.4 million.

Table F4. WAP, generational flows (2000–2015)

	2000–2005			2005–2010			2010–2015			2000–2015		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Generational entries	1,943	1,890	3,834	1,876	1,811	3,686	1,967	1,895	3,862	5,786	5,596	11,382
Generational exits	-1,462	-1,394	-2,752	-1,575	-1,498	-3,074	-1,981	-1,998	-3,959	-5,019	-4,890	-9,784
Generational balance	481	497	1,082	300	312	613	-14	-103	-97	768	706	1,598
Migration balance	296	420	612	160	190	349	445	626	1,051	901	1,236	2,013
Total balance	**777**	**917**	**1,694**	**460**	**502**	**962**	**431**	**523**	**954**	**1,668**	**1,942**	**3,610**
Total entries	**2,240**	**2,310**	**4,446**	**2,035**	**2,001**	**4,036**	**2,412**	**2,521**	**4,913**	**6,687**	**6,832**	**13,395**

Translating these data on yearly average values (Graph F4), generational entries into WAP have been equal to 759,000, generational exits to -652,000. This has generated a positive generational balance of 107,000, which has been increased by a migration balance of 134,000. Therefore, average yearly entries into WAP have been equal to 893,000.

Graph F4. WAP, yearly average generational flows in the period 2000–2015



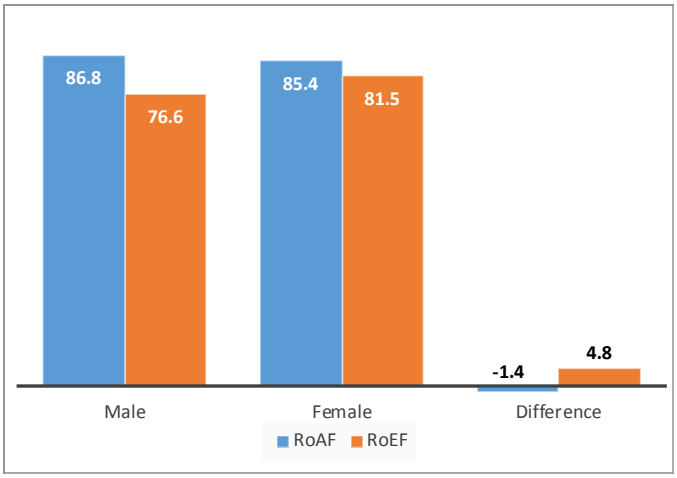
At the same time, total entries into labour force and employment were equal to 11.6 and 10.7 million, which translated into average yearly values of 771,000 and 707,000 and in a total ROAF of 86.4 per cent and total RoEF of 79.2 per cent. The success rate was therefore of 92.7 per cent.

Notable differences exist, however, between the flow rates of men and women. Between 2000 and 2015, 86.8 per cent of the young men that entered WAP did also enter the labour force, but only 76.6 per cent succeeded in finding a job; the corresponding values for women were 85.4 and 81.5 per cent. Therefore, the propensity of women to enter the labour market was slightly lower than that of men (Graph F5), but their rate of success was notably higher: 95.4 per cent versus 88.2 per cent.

Table F5. Labour force and employment – Net generational flows (2000–2015)

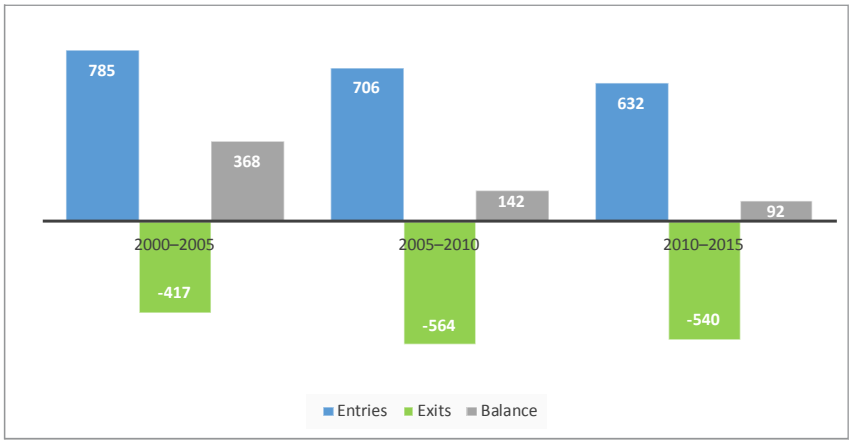
	2000–2005			2005–2010			2010–2015			2000–2015		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
	Labour force											
Entries	2,016	1,952	3,945	1,906	1,967	3,853	1,885	1,916	3,774	5,807	5,835	11,572
Exits	-1,444	-992	-2,413	-1,619	-1,365	-2,963	-1,470	-1,249	-2,692	-4,532	-3,606	-8,068
Balance	**573**	**960**	**1,532**	**287**	**602**	**889**	**415**	**667**	**1,082**	**1,275**	**2,229**	**3,504**
	Employment											
Entries	1,896	2,042	3,925	1,693	1,854	3,528	1,535	1,669	3,160	5,124	5,566	10,613
Exits	-1,271	-827	-2,085	-1,558	-1,280	-2,820	-1,525	-1,219	-2,699	-4,355	-3,326	-7,605
Balance	**625**	**1,215**	**1,840**	**135**	**574**	**709**	**10**	**451**	**461**	**770**	**2,239**	**3,009**
RoAF	90.0	84.5	88.7	93.6	98.3	95.5	78.2	76.0	76.8	86.8	85.4	86.4
RoEF	84.7	88.4	88.3	83.2	92.7	87.4	63.7	66.2	64.3	76.6	81.5	79.2
Rate of success	**94.1**	**104.6**	**99.5**	**88.8**	**94.3**	**91.6**	**81.5**	**87.1**	**83.7**	**88.2**	**95.4**	**91.7**

Graph F5. RoA and RoE in terms of flow by sex and gender differentials (2000–2015)



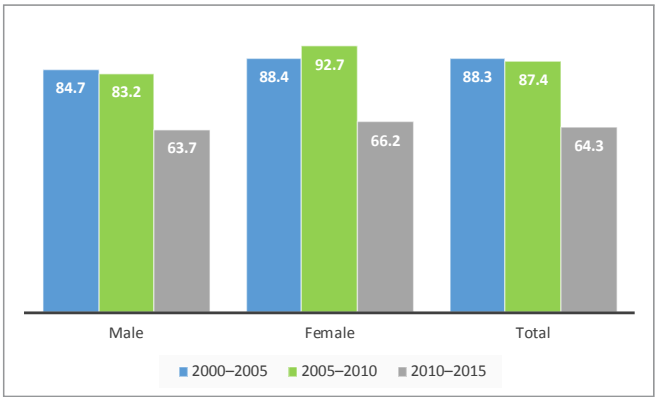
Also, the French labour market was affected by the financial crisis. This is clearly shown by the progressive decline of the yearly entries into employment from 785,000 to 706,000 to 632,000 while exits present a positive trend with a maximum of 564,000 between 2005 and 2010 (Graph F6). Therefore, the decline in the employment balance was due both to the decline in entries and the increase in exits. It should be noted that the percentage of women over total entries has always been above 50 per cent (around 52% with a maximum of 57% in the last period).

Graph F6. Employment: Generational entries, exits and balance (2000–2005, 2005–2010, 2010–2015)

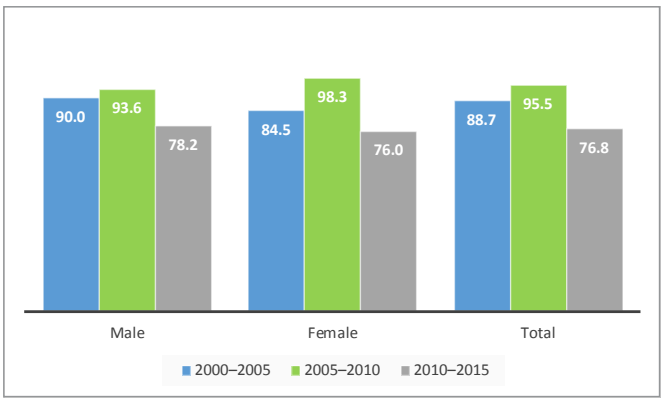


These trends are well captured by the RoE in terms of flow. The total rate declines from 88.3 per cent, to a value of 87.4 per cent and then to 64.3 per cent (Graph F7). It should be underlined that the rates of women were constantly notably higher than those of men, reaching a maximum of 92.7 per cent in the second period, while those of men present the same trend of the total.

Graph F7. RoE and RoA in terms of flow by sex, 2000–2005, 2005–2010 and 2010–2015



Graph F7a. RoE



Graph F7b. RoA

The RoAF peaked in the second period and present a smaller range of values, the total rates being included between a maximum of 95.5 per cent between 2005 and 2010 and a minimum of 76.8 per cent in the following period. Women's rates exceeds those of men only in the second period.

The gross flows, inclusive of inter-educational level passages, allow estimating the structure of entries into labour force and employment by educational level. Starting from the average values of the labour demand in terms of flow over the 15-year period, it can be observed that:

(a) Almost one half of entries into employment was represented by people with high education, 10.6 per cent by people with low education and 39.7 per cent by people with intermediate education (Table F6);
(b) The average educational level of the women that entered the employment area was much higher than that of men, so much so that 52.7 per cent of women that entered the employment area had high education, while the percentage of men was of only 46 per cent; and
(c) For both men and women, the average educational level of entries into labour force has been slightly lower than that of the entries into employment (Table F7).

The decline in the number of total entries into employment that have been previously observed affected mainly the people with low education whose entries declined from 682,000 to 128,000 and people with intermediate education, whose entries declined from 1.596 million to 1.38 million. On the contrary, entries by people with high education increased from 1.69 million to 2.1 million. As a consequence, the entries' share of people with high reduction increased from 42.5 per cent to 58.3 per cent, while that of people with low education declined from 17.2 per cent to 3.5 per cent. It should be underlined that between 2005 and 2010, women with high education started to represent the absolute majority (50.9%) of women entries and the percentage increased to 63.4 per cent in 2010–2015. In this last period also, men's entries became the absolute majority (58.3%).

Similar long-term trends characterized the labour force (Table F7). Some differences must however be underlined. In the first place, the presence of people with low education in the supply did not decline. Therefore, the percentage of generational entries into labour force with intermediate and high education was lower than that of entries into employment. In conclusion, the average educational level of labour demand has become higher than that of supply.

Table F6. Employment: Gross entry flows; absolute values and percentage composition by educational level (2000–2015)

	2000–2005			2005–2010			2010–2015			2000–2015		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
	Absolute values											
ISCED 0–2	326	379	682	189	215	371	90	50	128	604	645	1,181
ISCED 3–4	856	771	1,596	760	698	1,437	750	630	1,380	2,367	2,099	4,413
ISCED 5–8	794	931	1,686	805	945	1,732	931	1,176	2,107	2,530	3,052	5,525
Total	**1,976**	**2,081**	**3,964**	**1,754**	**1,859**	**3,540**	**1,771**	**1,857**	**3,615**	**5,501**	**5,796**	**11,120**
	Percentage composition											
ISCED 0–2	16.5	18.2	17.2	10.8	11.6	10.5	5.1	2.7	3.5	11.0	11.1	10.6
ISCED 3–4	43.3	37.0	40.3	43.3	37.6	40.6	42.4	33.9	38.2	43.0	36.2	39.7
ISCED 5–8	40.2	44.7	42.5	45.9	50.9	48.9	52.6	63.4	58.3	46.0	52.7	49.7
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Table F7. Labour force: Gross entry flows; absolute values and percentage composition by educational level (2000–2015)

	2000–2005			2005–2010			2010–2015			2000–2015		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
	Absolute values											
ISCED 0–2	336	271	534	295	260	522	137	573	679	769	1,104	1,736
ISCED 3–4	915	737	1,619	847	763	1,591	1,002	770	1,772	2,764	2,271	4,981
ISCED 5–8	860	984	1,808	829	949	1,765	1,062	1,293	2,355	2,750	3,225	5,928
Total	**2,111**	**1,992**	**3,961**	**1,971**	**1,972**	**3,878**	**2,201**	**2,636**	**4,806**	**6,283**	**6,600**	**12,645**
	Percentage composition											
ISCED 0–2	15.9	13.6	13.5	15.0	13.2	13.5	6.2	21.7	14.1	12.2	16.7	13.7
ISCED 3–4	43.3	37.0	40.9	43.0	38.7	41.0	45.5	29.2	36.9	44.0	34.4	39.4
ISCED 5–8	40.7	49.4	45.7	42.0	48.1	45.5	48.3	49.0	49.0	43.8	48.9	46.9
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

In conclusion, it should be underlined that over the 15-year period, the following are being considered:

(a) The average educational level of both the entries into the labour force and into employment progressively increased;
(b) The educational group most affected by the decline in labour demand was the group with low education; and
(c) Women entering the labour market and especially employment had, on the average a higher educational level than men.

The scenarios: The stock approach

In absence of migration, from 2015 to 2030, French WAP is expected to decline by 1.1 million (which corresponds to an average yearly rate of -75,000 people per year) down from 40.9 million to 39.8 million (Table F8).

Table F8. WAP, labour force and employment (2015) and in alternative hypothesis of labour force participation and employment growth (2020, 2025 and 2030); values in thousands

	WAP	Labour force		Employment		
		A	B	1	2	3
2015	40,927	29,164	29,164	26,119	26,119	26,119
2020	40,638	29,295	29,464	26,897	27,287	27,676
Difference	**-289**	**132**	**301**	**779**	**1,168**	**1,557**
2025	40,489	29,525	29,861	27,699	28,507	29,326
Difference	**-149**	**229**	**397**	**802**	**1,220**	**1,650**
2030	39,808	29,359	29,856	28,525	29,782	31,075
Difference	**-681**	**-166**	**-6**	**826**	**1,275**	**1,749**
2015–2030	-1,119	195	692	2,406	3,663	4,956
Difference	**-75**	**13**	**46**	**160**	**244**	**330**

In order to evaluate the labour needs (that in the present analytic context are defined as the difference between the increase in supply and the increase in demand), the following assumptions were made.

For the labour force, two alternative scenarios were assumed:

(a) The rate of activity will progressively increase by the same percentage points as in the previous 15-year period (+2.5 percentage points); and
(b) The rate of activity will progressively increase by 3.7 percentage points, that is by 1.5 more percentage points than in the previous 15-year period.

For employment, three different situations will be considered. More specifically, employment will increase:

(a) At a rate equal to two thirds that registered between 2000 and 2015 (8.9% over the 15-year period);
(b) At a rate equal to that registered between 2000 and 2015 (13.4%); and
(c) At a rate equal to four thirds that registered between 2000 and 2015 (17.9%).

Table F8 shows the implication of these assumptions for labour force and employment. In Scenario A, labour force will increase by 195,000 and in Scenario B by 692,000, which correspond to average yearly values of 13,000 and 46,000 respectively. At the same time, employment is projected to increase in the three scenarios by around 2.4 million, 3.7 million and almost 5 million, the yearly average values being 160,000, 244,000 and 330,000.

Crossing the two labour force scenarios with the three employment scenarios, six scenarios of labour needs and migration balance can be obtained. As already indicated, the labour shortage is computed as the difference between the change in labour supply (labour force) and labour demand (employment).

In the six scenarios thus obtained (Table F9), the labour shortage ranges between a minimum of 1.7 million (Scenario B1) and a maximum of 4.7 million (Scenario A3). Assuming an elasticity of the migration balance to the labour needs of 1.3, an estimate of the yearly average migration balance between 149,000 and 413,000 is obtained. It is therefore evident that even under the most “favourable” conditions (an increase in the rate of activity of 3.7 percentage points and a modest expansion in employment equal to an average value of 0.6% per year), migration will not be an option but a necessity.

Table F9. Labour shortage and migration balance in six scenarios of labour participation and employment growth in the period 2015–2030

	A1	A2	A3	B1	B2	B3
	Labour shortage					
2015–2020	-647	-1,036	-1,426	-478	-867	-1,257
2020–2025	-573	-991	-1,421	-405	-823	-1,253
2025–2030	-992	-1,441	-1,914	-832	-1,281	-1,755
2015–2030 (Total)	**-2,211**	**-3,468**	**-4,761**	**-1,715**	**-2,971**	**-4,265**
2015–2030 (Yearly)	**-147**	**-231**	**-317**	**-114**	**-198**	**-284**
	Estimated migration balance					
2015–2020	841	1,347	1,853	621	1,128	1,634
2020–2025	744	1,288	1,847	526	1,070	1,629
2025–2030	1,289	1,873	2,489	1,081	1,665	2,281
2015–2030 (Total)	**2,875**	**4,508**	**6,189**	**2,229**	**3,863**	**5,544**
2015–2030 (Yearly)	**192**	**301**	**413**	**149**	**258**	**370**

Table F10 shows that once migration is linked to labour needs, WAP will not decline but increase, the increase being positively related to employment growth; at the same time, labour force will increase, the growth being positively related to employment expansion and inversely related to the rate of participation. Unemployment, as well as the rate of unemployment, are projected to decline in all scenarios, the improvement being directly related to employment expansion and inversely related to the increase in the rate of activity.

Table F10. Main labour market variables and main labour market indicators (2015) in six scenarios of labour force participation and employment growth (2030)

	WAP	Labour force	Employment	Unemployment	RoA	RoE	RoU
	2015						
	40,927	29,164	26,119	3,045	71.3	63.8	10.4
	2030						
A1	42,682	31,479	28,525	2,954	73.8	66.8	9.4
A2	44,316	32,684	29,782	2,902	73.8	67.2	8.9
A3	45,997	33,924	31,075	2,849	73.8	67.6	8.4
B1	42,037	31,527	28,525	3,002	75.0	67.9	9.5
B2	43,671	32,753	29,782	2,971	75.0	68.2	9.1
B3	45,352	34,013	31,075	2,939	75.0	68.5	8.6

The scenarios in terms of flows: Labour needs by educational level

The previous analysis in terms of flows has allowed to estimate the flow labour demand and flow labour supply by educational level over the 2000–2015 period. This approach provides a way to estimate scenarios of the future labour demand in terms of flow that will be expressed by the French economic system and the future labour supply that will be generated by the people present in France in 2015, both by educational level. The labour needs in alternative hypotheses of labour demand and supply will then be computed. To carry on this exercise, a series of additional assumptions are needed.

(a) Entries in WAP in the 2015–2030 period will be equal to the number of young people that were in the 0–14 age bracket in 2015;
(b) For what relates to labour force, two scenarios were built assuming that the percentage of entries into the labour force with respect to the entries into WAP (the RoAF) will be equal: (i) to the rate registered between 2000 and 2015 (86.4%); and (ii) to the rate registered in the same period by men (86.8%), which implies a complete alignment of women's behaviour to men's behaviour.

The labour demand in terms of flow is equal to the sum of the replacement demand and the additional demand. To compute the labour demand in terms of flow, it can be assumed that:

(a) The replacement demand will be equal to the number of the employed in the 50–64 age group in 2015, that will necessarily exit the labour market for age-related reasons; and
(b) The additional demand will be taken equal to the values used in the stock scenarios.

This process does therefore produce two estimates of labour supply and three estimates of labour demand in terms of flow that are shown, together with the estimate of the entries into WAP in Table F11.

Table F11. Entries into WAP, labour force and employment in alternative scenarios (2015–2030)

Entries into WAP		Entries into labour force		Entries into employment		
				Replacement demand	Additional demand	Labour demand in terms of flow
15-year values						
11,503	A	9,937	1	7,520	2,406	9,926
	B	9,989	2		3,663	11,183
			3		4,956	12,476
Average yearly values						
767	A	662	1	501	160	662
	B	666	2		244	746
			3		330	832

A simple inspection of the data shows that:

(a) Generational exits from employment are lower than generational entries into the labour force;
(b) Therefore the level of labour shortage will depend on the level of additional demand; and
(c) In two scenarios generational entries into employment are higher than generational entries into labour force, and in one generational entries into employment are not only higher than entries into labour force, but also of the entries into WAP.

Finally, concerning the percentage share of the three educational levels of labour supply and labour demand we have assumed, in a conservative vein, that in the next 15 years, the structure of entries into labour force and employment will have the same structure as the one registered in the previous 15 (Graph F8). This hypothesis is justified by the consideration that the strong trends detected in the 2000–2015 period could be more the result of cyclical oscillations than of structural trends. It should also be underlined that the average educational level of the demand in terms of flow is higher than that of the supply in terms of flow.

Graph F8. Projected shares of educational levels for the labour supply and the labour demand in terms of flows; average values for the period 2015–2030

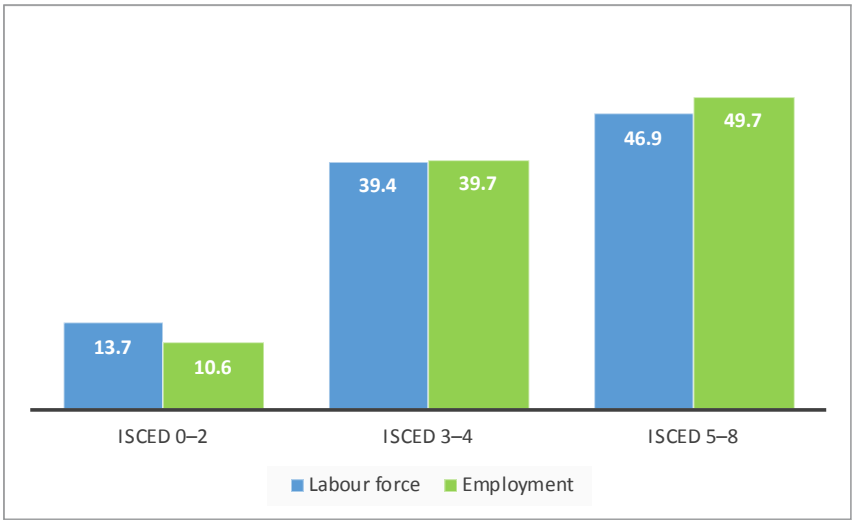


Table F12 reports the entries in labour force and employment by educational level in the alternative hypotheses of labour force participation and (employment) growth.

Table F12. Entries into labour force and employment by educational level in alternative scenarios (2015–2030)

	Labour supply in terms of flow in alternative scenarios		Labour demand in terms of flow in alternative scenarios		
	A	B	1	2	3
	Absolute values in thousands				
ISCED 0–2	1,364	1,371	1,055	1,188	1,326
ISCED 3–4	3,915	3,935	3,939	4,438	4,951
ISCED 5–8	4,659	4,683	4,932	5,557	6,199
Total	**9,937**	**9,989**	**9,926**	**11,183**	**12,476**
Yearly	**662**	**666**	**662**	**746**	**832**

Finally, labour needs were computed as the difference between the labour supply and the labour demand in terms of flows for each educational level, as well as the share of each educational level on the total demand (Table F13).

Table F13. Labour needs by educational level in three scenarios of employment growth; total values and percentage composition; 2015–2030

	Labour needs in alternative scenarios					
	A1	A2	A3	B1	B2	B3
	Absolute values					
ISCED 0–2	310	176	39	317	183	46
ISCED 3–4	-25	-503	-1,012	-4	-503	-1,016
ISCED 5–8	-274	-874	-1,267	-250	-874	-1,517
Total	**11**	**-1,245**	**-2,539**	**63**	**-1,194**	**-2,487**
Yearly	**1**	**-83**	**-169**	**4**	**-80**	**-166**

	Percentage composition by educational level					
ISCED 0–2						
ISCED 3–4	8.2	36.5	44.4	1.7	36.5	40.1
ISCED 5–8	91.8	63.5	55.6	98.3	63.5	59.9
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Starting from the total, it can be observed that in two scenarios, those with the lowest employment growth, the total supply, as already seen, appears to be just sufficient. However, when the single educational groups are analysed:

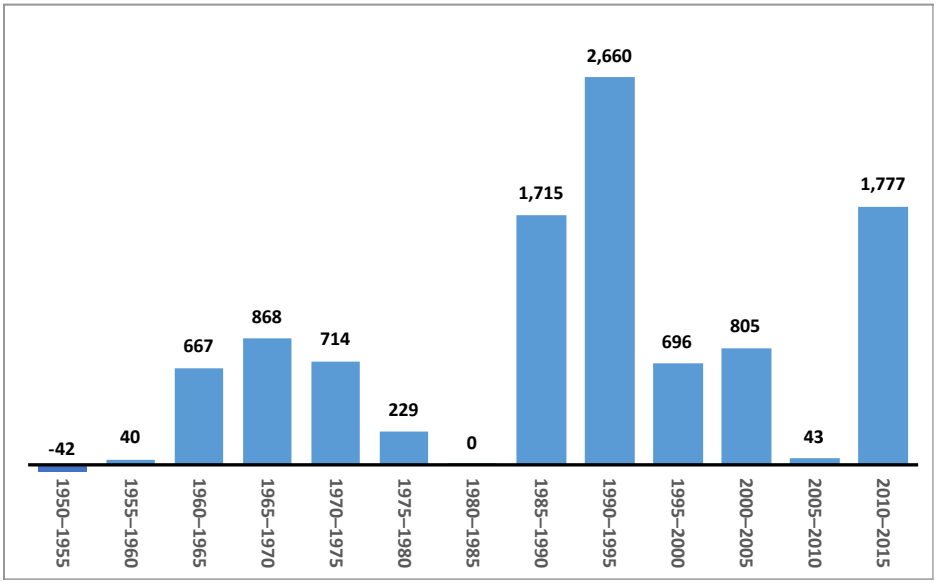
(a) The supply of those with the lowest educational level is sufficient in all scenarios;
(b) The supply of people with intermediate education is almost sufficient in the two scenarios with the lowest employment growth; and
(c) The supply of people with high education is insufficient in all scenarios.

In conclusion, if employment will grow less than in the previous 15-year period, France will need a small number of migrants with high education, mainly with high education; if it will grow of the same amount, almost two thirds of economic migrants should have a high educational level. If the rate of growth will be higher, the need of both groups will increase, the increase being more pronounced for the people with intermediate education.

GERMANY

Germany has been an immigration country since the middle of the 1950s, the migration balance clearly showing a strong cyclical behaviour (Graph G1). Therefore, it could be expected that employment growth conjugated with the drop in supply generated by the demographic trend, affecting the country in the next 15 years, will make immigration necessary to allow and sustain economic and social development.

Graph G1. Migration balance; five-year values in thousands (1950–1955 to 2010–2015)



Source: UN DESA, 2017.

The labour market: A background analysis

Stock analysis. In 2015, Germany's labour market was in a very healthy condition. In spite of the international financial crisis, from 2000 to 2015, employment increased by 2.3 million (+6.1%) with labour force increasing by only 2 million (+5.2%) and unemployment declining by 233,000 (-10.7%) (Table G1). At the same time, immigration flows were not sufficient to offset the natural decline in WAP, so that the total demographic balance was largely negative (-2.1 million, -3.9%).

Table G1. Main labour variables by sex, total and by educational level (ISCED) in 2000 and 2015; absolute and percentage change from 2000 to 2015

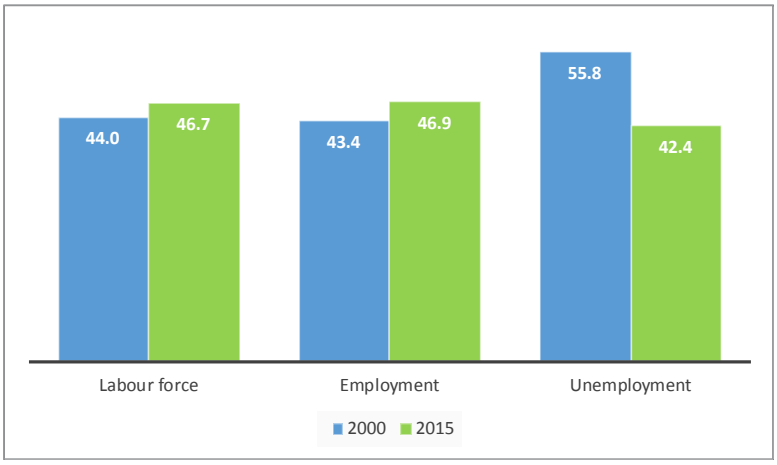
		2000			2015			2000–2015					
		Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
		Absolute values						Absolute change			Percentage change		
All levels	WAP	27,755	27,322	55,077	26,669	26,245	52,914	-1,085	-1,077	-2,163	-3.9	-3.9	-3.9
	Labour force	21,875	17,222	39,097	21,926	19,191	41,117	50	1,970	2,020	0.2	11.4	5.2
	Employment	20,904	16,009	36,923	20,808	18,368	39,176	-96	2,358	2,253	-0.5	14.7	6.1
	Unemployment	972	1,212	2,174	1,118	824	1,941	146	-389	-233	15.0	-32.1	-10.7
ISCED 0–2	WAP	5,887	7,696	13,580	5,043	5,453	10,496	-844	-2,242	-3,084	-14.3	-29.1	-22.7
	Labour force	3,688	3,441	7,130	2,947	2,509	5,456	-742	-932	-1,674	-20.1	-27.1	-23.5
	Employment	3,323	3,093	6,420	2,577	2,266	4,842	-746	-827	-1,578	-22.5	-26.7	-24.6
	Unemployment	365	348	710	370	243	615	5	-105	-96	1.3	-30.1	-13.5
ISCED 3–4	WAP	15,072	15,192	30,261	14,632	15,199	29,831	-441	7	-430	-2.9	0.0	-1.4
	Labour force	12,131	10,232	22,364	12,451	11,853	24,304	319	1,621	1,940	2.6	15.8	8.7
	Employment	11,563	9,509	21,079	11,874	11,413	23,283	311	1,904	2,204	2.7	20.0	10.5
	Unemployment	569	723	1,285	577	440	1,021	8	-283	-264	1.4	-39.2	-20.5
ISCED 5–8	WAP	6,786	4,465	11,257	6,995	5,592	12,587	209	1,127	1,330	3.1	25.2	11.8
	Labour force	6,052	3,545	9,598	6,507	4,806	11,313	455	1,260	1,715	7.5	35.5	17.9
	Employment	6,018	3,407	9,425	6,368	4,687	11,055	350	1,280	1,630	5.8	37.6	17.3
	Unemployment	34	139	173	139	119	258	105	-20	85	309.0	-14.2	49.2

The dynamic of the female component has been much more pronounced than that of men, with women's labour force and employment increasing respectively by 2 and 2.25 million (11.4 and 14.7%), while the number of women unemployed declined by 389,000. On the other side, men's employment slightly declined (-96,000) and labour force slightly increased (+50,000).

As a consequence: (a) the percentage of women in labour force and employment increased getting closer to parity with men; (b) the increase in unemployment affected only men; so that (c) the percentage of women in unemployment declined (from 55.8% to 42.4%) (Graph G2).

The result of the previous trends was a notable improvement in all main labour market indicators. The RoE increased from 67 to 74 per cent. Since the increase in the rate of activity was less pronounced (from 71% to 77.6%), the RoU declined from 5.6 per cent to 4.7 per cent (Table G2).

Graph G2. Labour force, employment and unemployment rates: Percentage of women (2000 and 2015)



Due to the decline in WAP, also men's RoE improved (from 75.3% to 78%), while that of women climbed to 70 per cent from an initial value of 58.6 per cent. Therefore, the gender differential dropped from 16.7 percentage points to 8 percentage points. Moreover, the RoU of women declined below that of men (4.3% versus 5.1%).

Table G2. Main labour indicators by sex and educational level in 2000 and 2015 and absolute change from 2000 to 2015

		2000			2015			2000–2015		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
All levels	RoA	78.8	63.0	71.0	82.2	73.1	77.7	3.4	10.1	6.7
	RoE	75.3	58.6	67.0	78.0	70.0	74.0	2.7	11.4	7.0
	RoU	4.4	7.0	5.6	5.1	4.3	4.7	0.7	-2.7	-0.8
ISCED 0–2	RoA	62.7	44.7	52.5	58.4	46.0	52.0	-4.2	1.3	-0.5
	RoE	56.4	40.2	47.3	51.1	41.6	46.1	-5.4	1.4	-1.1
	RoU	9.9	10.1	10.0	12.6	9.7	11.3	2.7	-0.4	1.3
ISCED 3–4	RoA	80.5	67.4	73.9	85.1	78.0	81.5	4.6	10.6	7.6
	RoE	76.7	62.6	69.7	81.1	75.1	78.0	4.4	12.5	8.4
	RoU	4.7	7.1	5.7	4.6	3.7	4.2	-0.1	-3.4	-1.5
ISCED 5–8	RoA	89.2	79.4	85.3	93.0	85.9	89.9	3.8	6.5	4.6
	RoE	88.7	76.3	83.7	91.0	83.8	87.8	2.4	7.5	4.1
	RoU	0.6	3.9	1.8	2.1	2.5	2.3	1.6	-1.4	0.5

In summary, in the first 15 years of the century, Germany witnessed a pronounced increase in employment and a progressive feminization of its labour force. Moreover, the decline of the local WAP was not completely matched by immigration, and this contributed to a notable improvement of all main labour market indicators.

Another very relevant tendency of this period is the improvement in the educational level of the labour force and the employed. Starting from the demand side, the increase in the employment level was the result, on the one hand, of the decrease of 1.6 million people with low education (-24.6%), and on the other hand, of the increase of 2.2 million with intermediate education (10.5%) and of 1.6 million with high education (17.3%). As a consequence, in 2015, the percentages of employed in the three educational levels were equal respectively to 12.4 per cent, 59.4 per cent and 28.2 per cent, the average educational level being a little higher for women than for men.

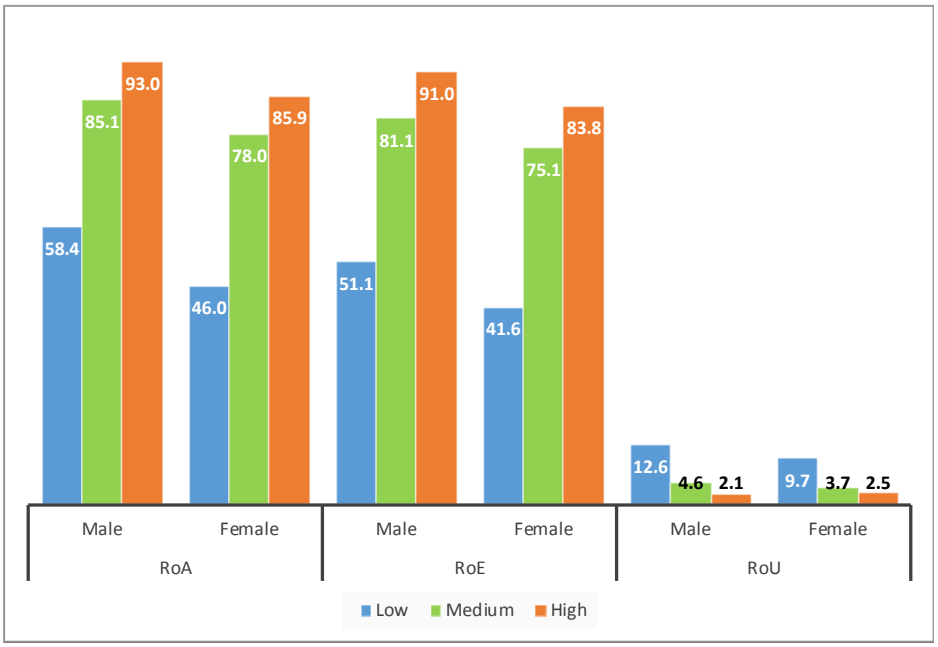
Table G3. Main economic variables; percentage composition by sex and educational level (2015)

	2000			2015			2000–2015		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
	WAP								
Low	21.2	28.1	24.6	18.9	20.8	19.8	-2.3	-7.4	-4.8
Medium	54.3	55.5	54.9	54.9	57.9	56.4	0.5	2.4	1.5
High	24.5	16.3	20.4	26.2	21.3	23.8	1.8	5.0	3.4
	Labour force								
Low	16.9	20.0	18.2	13.5	13.1	13.3	-3.4	-6.9	-5.0
Medium	55.5	59.4	57.2	56.8	61.8	59.2	1.4	2.4	2.0
High	27.7	20.6	24.6	29.7	25.1	27.5	2.0	4.5	3.0
	Employment								
Low	15.9	19.3	17.4	12.4	12.3	12.4	-3.5	-7.0	-5.0
Medium	55.3	59.4	57.1	57.0	62.1	59.4	1.7	2.7	2.3
High	28.8	21.3	25.5	30.6	25.5	28.2	1.8	4.2	2.7
	Unemployment								
Low	37.7	28.8	32.8	34.1	30.3	32.5	-3.7	1.6	-0.3
Medium	58.8	59.8	59.3	53.2	54.8	53.9	-5.6	-4.9	-5.3
High	3.5	11.5	8.0	12.8	14.9	13.6	9.3	3.4	5.6

The educational level of the supply of labour was slightly lower for both men and women and still lower was the educational level of WAP. However, the lowest average educational level was that of the unemployed. In this case, the people with the lowest educational level were almost one third, while the people with high education only 13.6 per cent. It should be underlined that the educational level of unemployed women was slightly higher than that of men.

This situation is well reflected by the main labour market indicators (Table G2). As usual, the RoA and RoE are directly related to the educational level, while the RoU is inversely related. Moreover, the range of women rates is wider than that of men, which means education makes a difference especially for women. As shown by Graph G2, men's rates of participation range from 58.4 per cent to 93 per cent and those of women from 46 per cent to 85.9 per cent so that the gender differential is inversely related to education, declining from 12.4 to 7.1 percentage points. The situation is quite similar for the RoE.

Graph G3. Main economic indicators by sex and educational level (2015)



The RoUs present, on the contrary, an inverse relationship with education, ranging from 12.6 per cent for men with low education to 2.1 per cent for men with high education and from 9.7 to 2.5 per cent for women. This could be interpreted as confirming that education makes a difference, and it pays to study. An alternative equally possible explanation is that people with high education are becoming the relatively more scarce resource.

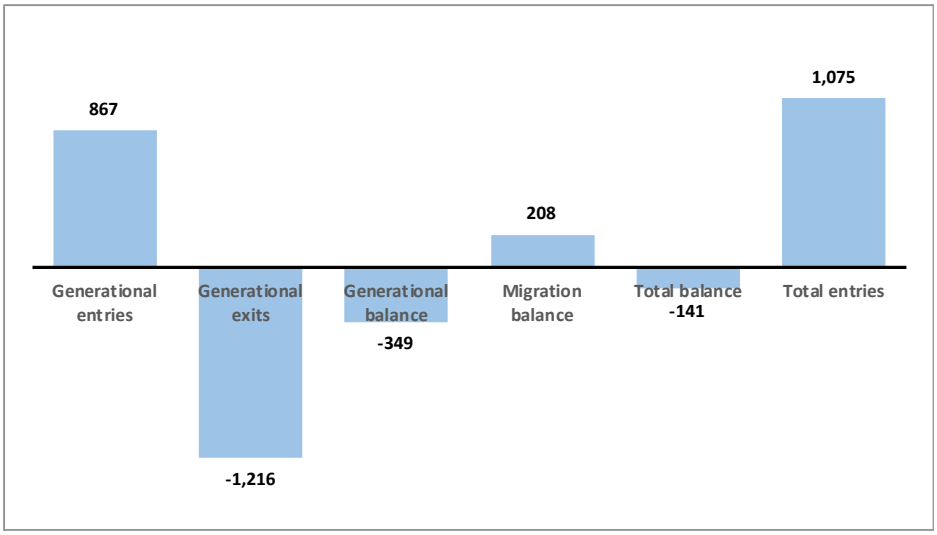
Generational flow analysis. Between 2000 and 2015, WAP has been affected by a natural decline of 5.2 million due to the interaction of generational entries and exits, only partially offset by a positive migration balance that can be estimated above 3.1 million. Taking into consideration natural entries and the migration balance, total entries amount to around 16.1 million, which corresponds to a little less than 1.1 million per year.

Table G4. WAP, generational flows (2000–2015)

	2000–2005			2005–2010			2010–2015			2000–2015		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Generational entries	2,508	2,361	4,869	2,110	1,997	4,106	2,107	1,927	4,034	6,725	6,284	13,009
Generational exits	-3,531	-3,276	-6,803	-3,457	-3,116	-6,554	-2,455	-2,441	-4,881	-9,442	-8,833	-18,238
Generational balance	-1,023	-915	-1,935	-1,347	-1,120	-2,447	-347	-515	-847	-2,717	-2,550	-5,229
Migration balance	826	799	1,622	38	64	83	792	634	1,411	1,656	1,498	3,116
Total balance	**-197**	**-116**	**-313**	**-1,309**	**-1,056**	**-2,364**	**445**	**120**	**564**	**-1,061**	**-1,052**	**-2,113**
Total entries	**3,334**	**3,160**	**6,491**	**2,148**	**2,061**	**4,189**	**2,899**	**2,561**	**5,445**	**8,381**	**7,781**	**16,125**

Translating these data on yearly average values (Graph G4), generational entries into WAP have been equal to 867,000, generational exits to -1,216,000. This has generated a negative generational balance of -349,000, which has been only partially offset by a migration balance of 208,000. The result was a total balance of -141,000. Therefore average yearly entries into WAP have been equal to 1,075,000.

Graph G4. WAP; yearly average generational flows in the period 2000–2015



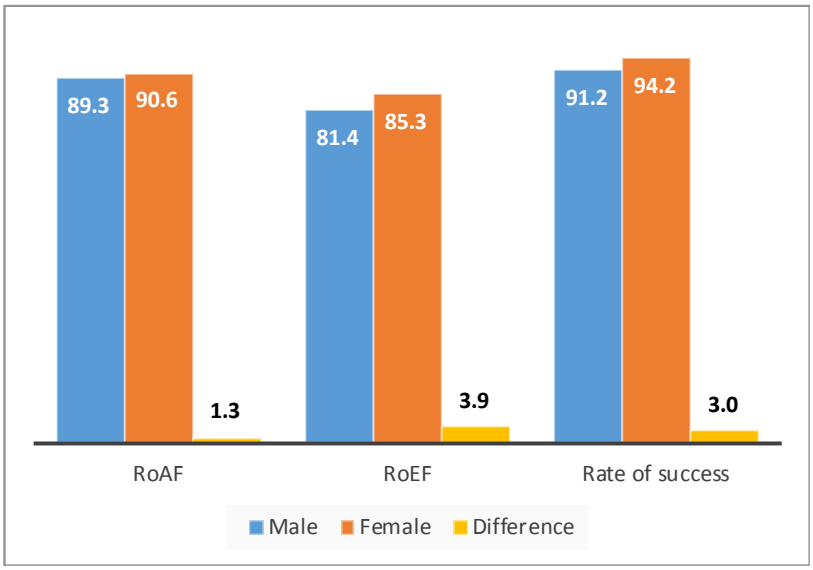
In the same time, total entries into labour force and employment were equal to 14.4 and 13.3 million, which translated into average yearly values of 961,000 and 888,000 per year. This implies RoAF of 89.4 per cent, a RoEF of 82.6 and therefore a rate of success of 92.4 per cent.

Table G5. Labour force and employment net generational flows (2000–2015)

	2000–2005			2005–2010			2010–2015			2000–2015		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
	Labour force											
Entries	2,900	2,590	5,403	2,037	2,204	4,200	2,547	2,259	4,805	7,484	7,053	14,409
Exits	-2,574	-1,601	-4,089	-2,597	-1,877	-4,433	-2,262	-1,605	-3,867	-7,433	-5,083	-12,389
Balance	**326**	**989**	**1,314**	**-560**	**327**	**-233**	**285**	**654**	**939**	**50**	**1,970**	**2,020**
	Employment											
Entries	1,854	1,807	3,550	2,294	2,430	4,723	2,675	2,404	5,046	6,823	6,641	13,319
Exits	-3,125	-1,611	-4,635	-1,911	-1,321	-3,231	-1,886	-1,354	-3,207	-6,922	-4,286	-11,073
Balance	**-1,271**	**196**	**-1,085**	**383**	**1,109**	**1,492**	**789**	**1,050**	**1,839**	**-99**	**2,355**	**2,246**
RoAF	87.0	82.0	83.2	94.9	107.0	100.3	87.8	88.2	88.2	89.3	90.6	89.4
RoEF	55.6	57.2	54.7	106.8	117.9	112.7	92.3	93.9	92.7	81.4	85.3	82.6
Rate of success	**63.9**	**69.8**	**65.7**	**112.6**	**110.2**	**112.5**	**105.0**	**106.4**	**105.0**	**91.2**	**94.2**	**92.4**

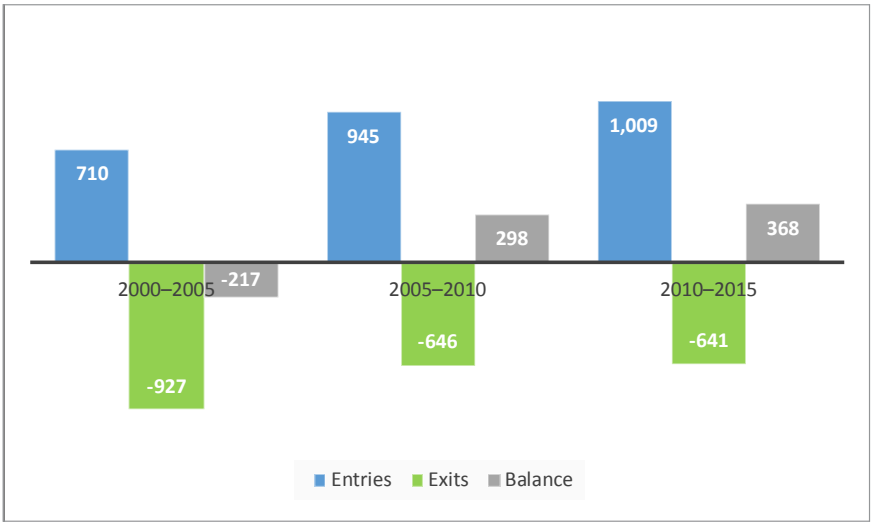
The differences between the flow rates of men and women are quite limited and present interesting peculiarities. Between 2000 and 2015, 89.3 per cent of the young men that entered WAP did also enter the labour force, while the percentage of entries into employment was 81.4 per cent; the corresponding rates for women were 90.6 per cent and 85.3 per cent. In conclusion, women had not only a higher propensity to enter the labour market, but also a higher success rate (94.2% versus 91.2%) (Graph G5).

Graph G5. Rates of activity, rates of employment and rates of success in terms of flow by sex (2010–2015)



Employment flow data clearly show that in the last 15 years, the situation of the German labour market has been progressively improving (Graph G6). After a first period of intense restructuring in which generational exits prevailed over generational entries, exits stabilized around a value of 640,000, while entries have been progressively increasing and in the last five-year period exceeded 1 million per year.

Graph G6. Employment: Generational entries, exits and balance; 2000–2005, 2005–2010, 2010–2015



The gross flows inclusive of inter-educational level passages allow to estimate the structure of entries into labour force and employment by educational level.

The educational level of both entries into the labour force and employment has progressively increased. The percentage of people with low and intermediate education has declined, while the percentage of people with high education has increased. In both cases, men are characterized by higher percentages of the low and high education levels, women by a higher percentage of the intermediate level. It should also be observed that while at the beginning of the period the average education level of labour demand in terms of flow was higher than that of the labour supply, by now the opposite is true.

In conclusion, at present in Germany, more than one third of labour demand is directed towards people with high education, a little less than 50 per cent towards people with intermediate education and only around 17 per cent towards people with low education.

Table G6. Labour force: Gross entry flows, absolute values and percentage composition by educational level (2000–2015)

	2000–2005			2005–2010			2010–2015			2000–2015		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
	Absolute values											
ISCED 0–2	751	645	1,388	613	441	1,054	527	422	946	1,890	1,507	3,388
ISCED 3–4	1,641	1,602	3,189	1,346	1,439	2,734	1,381	1,460	2,753	4,369	4,502	8,676
ISCED 5–8	806	605	1,407	874	906	1,744	1,101	846	1,942	2,781	2,357	5,092
Total	**3,198**	**2,852**	**5,985**	**2,832**	**2,786**	**5,531**	**3,009**	**2,728**	**5,641**	**9,039**	**8,366**	**17,157**
	Percentage composition											
ISCED 0–2	23.5	22.6	23.2	21.6	15.8	19.0	17.5	15.5	16.8	20.9	18.0	19.7
ISCED 3–4	51.3	56.2	53.3	47.5	51.6	49.4	45.9	53.5	48.8	48.3	53.8	50.6
ISCED 5–8	25.2	21.2	23.5	30.8	32.5	31.5	36.6	31.0	34.4	30.8	28.2	29.7
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Table G7. Employment: Gross entry flows, absolute values and percentage composition by educational level (2000–2015)

	2000–2005			2005–2010			2010–2015			2000–2015		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
	Absolute values											
ISCED 0–2	630	491	1,083	546	399	938	544	438	971	1,719	1,328	2,992
ISCED 3–4	1,138	1,213	2,278	1,388	1,533	2,906	1,454	1,594	2,962	3,980	4,339	8,145
ISCED 5–8	702	525	1,194	897	950	1,812	1,102	837	1,928	2,701	2,312	4,934
Total	**2,471**	**2,229**	**4,554**	**2,831**	**2,882**	**5,656**	**3,099**	**2,868**	**5,861**	**8,400**	**7,979**	**16,071**
	Percentage composition											
ISCED 0–2	25.5	22.0	23.8	19.3	13.9	16.6	17.5	15.3	16.6	20.5	16.6	18.6
ISCED 3–4	46.1	54.4	50.0	49.0	53.2	51.4	46.9	55.6	50.5	47.4	54.4	50.7
ISCED 5–8	28.4	23.6	26.2	31.7	33.0	32.0	35.6	29.2	32.9	32.2	29.0	30.7
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

The scenarios: The stock approach

Continuing its historical trend, in absence of migration, in the next 15 years, WAP is expected to decline by 8.5 million, which corresponds to an average of 566,000 people per year, down to 44.5 million (Table G8).

Table G8. WAP, labour force and employment (2015) and in alternative hypothesis of labour force participation and employment growth in 2020, 2025 and 2030; values in thousands

	WAP	Labour force		Employment		
		A	B	1	2	3
2015	52,964	41,117	41,117	35,977	35,977	35,977
2020	50,944	40,113	40,301	36,688	37,043	37,399
Difference	**-2,020**	**-1,004**	**-816**	**711**	**1,066**	**1,422**
2025	48,020	38,343	38,697	37,413	38,141	38,877
Difference	**-2,924**	**-1,770**	**-1,604**	**725**	**1,098**	**1,478**
2030	44,468	35,999	36,491	38,152	39,272	40,413
Difference	**-3,552**	**-2,344**	**-2,206**	**739**	**1,131**	**1,536**
2015–2030	-8,496	-5,118	-4,626	2,175	3,295	4,436
Difference	**-566**	**-341**	**-308**	**145**	**220**	**296**

In order to evaluate the labour needs (that in the present analytic context are defined as the difference between the increase in supply and the increase in demand), the following assumptions are made.

For the labour force, two alternative scenarios are assumed that take into consideration the extremely high level already reached by the German WAP, and especially by women:

(a) The rate of activity will progressively increase by the half percentage points registered in the previous 15-year period (+3.3 percentage points); and
(b) The rate of activity will progressively increase by 4.4 percentage points, that is by two thirds the increase registered in the previous 15-year period.

For employment, three different situations will be considered. More specifically, employment will increase:

(a) At a rate equal to two thirds that registered between 2000 and 2015 (5.9% over the 15-year period);

(b At a rate equal to that registered between 2000 and 2015 (8.9%); and
(c) At a rate equal to four thirds that registered between 2000 and 2015 (11.9%).

Table G8 makes explicit the implication of these assumptions for labour force and employment. In Scenario A, labour force will decline by 5.1 million and in Scenario B by 4.7 million, which correspond to average yearly values of -341,000 and -308,000. At the same time, employment is projected to increase by around 2.2 million, 3.3 million and 4.4 million respectively, the yearly average values being 145,000, 220,000 and 296,000.

Crossing the two labour force scenarios with the three employment scenarios, six scenarios of labour needs and migration balance can be obtained. As already indicated, the labour shortage is computed as the difference between the change in labour supply (labour force) and labour demand (employment).

The computations show (Table G9) that labour needs range between a minimum of 6.8 million (Scenario B1) and a maximum of 9.5 million (Scenario A3). If an elasticity of the migration balance to the labour needs of 1.3 is further assumed, an estimate of yearly migration balances between 589,000 and 828,000 can be obtained.

It is therefore evident that even under the most "favourable" conditions (the rate of activity reaching a world "record" of 82.1 percentage points and a modest expansion in employment equal to an average value of 0.4% per year), migration will not be an option but a necessity.

Table G9. Germany's labour shortage and migration balance in six scenarios of labour participation and employment growth in the 2015–2030 period

	A1	A2	A3	B1	B2	B3
	Labour shortage					
2015–2020	-1,715	-2,070	-2,425	-1,526	-1,882	-2,237
2020–2025	-2,495	-2,868	-3,248	-2,329	-2,702	-3,082
2025–2030	-3,083	-3,475	-3,880	-2,945	-3,337	-3,742
2015–2030 (Total)	**-7,293**	**-8,413**	**-9,554**	**-6,801**	**-7,920**	**-9,062**
2015–2030 (Yearly)	**-486**	**-561**	**-637**	**-453**	**-528**	**-604**

	A1	A2	A3	B1	B2	B3
	Estimated migration balance					
2015–2020	2,229	2,691	3,153	1,984	2,446	2,909
2020–2025	3,244	3,729	4,223	3,028	3,513	4,007
2025–2030	4,008	4,517	5,045	3,829	4,338	4,865
2015–2030 (Total)	**9,481**	**10,937**	**12,421**	**8,841**	**10,297**	**11,780**
2015–2030 (Yearly)	**632**	**729**	**828**	**589**	**686**	**785**

Table G10 shows that once migration is linked to labour needs, WAP and labour force will increase, the growth being positively related to employment expansion and inversely related to the rate of participation. However, unemployment as well as the rate of unemployment are projected to slightly increase in all scenarios.

Table G10. Main labour market variables and main labour market indicators in 2015 and in six scenarios of labour force participation and employment growth in 2030

	WAP	Labour force	Employment	Unemployment	RoA	RoE	RoU
	2015						
	52,964	41,117	39,176	1,941	77.6	74.0	5.0
	2030						
A1	53,949	43,674	41,351	2,323	81.0	76.6	5.3
A2	55,405	44,853	42,471	2,382	81.0	76.7	5.3
A3	56,888	46,054	43,612	2,442	81.0	76.7	5.3
B1	53,309	43,747	41,351	2,396	82.1	77.6	5.5
B2	54,764	44,941	42,471	2,470	82.1	77.6	5.5
B3	56,248	46,159	43,612	2,547	82.1	77.5	5.5

The scenarios in terms of flows: Labour needs by educational level

The previous analysis in terms of flows has allowed to estimate the flow labour demand and flow labour supply by educational level over the 2000–2015 period. This approach provides the way to estimate scenarios of the future labour demand in terms of flow that will be expressed by the German economic system and the future labour supply that will be generated by the people present in Germany in 2015, both by educational level. The labour needs in alternative hypotheses of labour demand can then be computed.

To carry on this exercise, a series of additional assumptions is needed. To estimate the future level of the supply of labour in terms of flow, it has been assumed that:

(a) Entries in WAP in the 2015–2030 period will be equal to the number of young people that were in the age bracket 0–14 in 2015; and
(b) 90 per cent of them (just a little more than the 88.2% registered between 2010 and 2015) will enter the labour market.

The labour demand in terms of flow is equal to the sum of the replacement demand and the additional demand. It can be assumed that:

(a) Replacement demand will be equal to the employed in 50–64 age group in 2015; and
(b) Additional demand will be taken equal to the values used in the stock scenarios.

This process will produce one estimate of labour supply and three estimates of labour demand. Table G11 summarizes the values of WAP, labour supply and labour demand in terms of flows generated by the previous hypothesis.

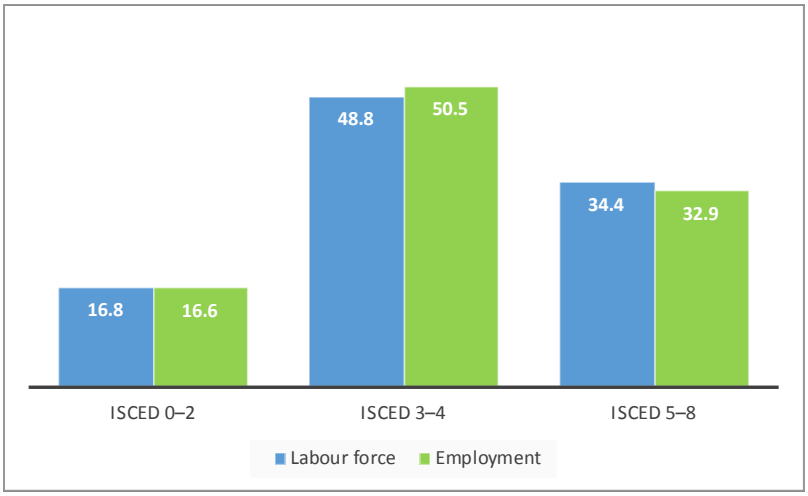
A simple inspection of the data shows that generational exits from employment are higher not only of generational entries into the labour force, but also of generational entries into WAP. This situation would be already sufficient to generate the need of foreign labour unless the increase in labour productivity would largely exceed the rate of growth in production.

Table G11. WAP, labour supply in terms of flows, replacement demand, additional demand and labour demand in terms of flow in three alternative scenarios of employment growth (2015–2030)

Entries into WAP		Entries into labour force		Entries into employment		
				Replacement demand	Additional demand	Labour demand in terms of flow
15-year values						
10,397	A	9,358	1	13,002	2,175	15,177
			2		3,295	16,296
			3		4,436	17,438
Average yearly values						
693	A	624	1	867	145	1,012
			2		220	1,086
			3		296	1,163

For what concerns the percentage share of the three educational levels of labour supply and labour demand, for simplicity, it can be assumed that they will remain equal to those registered between 2010 and 2015 (Graph G7).

Graph G7. Shares of educational levels for the labour supply in terms of flows and the labour demand in terms of flows; average values for the period 2015–2030



Using these data, the structure of the labour supply in terms of flow, the structure of the three labour demands by educational level were computed and shown in Table G12.

Table G12. Entries into labour force (labour supply in terms of flow) and entries into employment (entries into employment) by educational level in three scenarios of employment growth, 2015–2030; absolute values in thousands

	Labour supply in terms of flow	Labour demand in terms of flow in alternative scenarios		
	Scenario A	1	2	3
ISCED 0–2	1,569	2,514	2,699	2,888
ISCED 3–4	4,567	7,670	8,235	8,812
ISCED 5–8	3,221	4,994	5,362	5,738
Total	**9,358**	**15,177**	**16,296**	**17,438**
Yearly	**624**	**1,012**	**1,086**	**1,163**

Finally, the labour needs are computed as the difference between the labour supply and the labour demand in terms of flows for each educational level, as well as the share of each educational level on the total demand (Table G13).

Table G13. Labour needs by educational level in three scenarios of employment growth; total values and percentage composition; 2015–2030

	Labour needs in alternative scenarios		
	A1	A2	A3
	Absolute values		
ISCED 0–2	-944	-1,130	-1,319
ISCED 3–4	-3,102	-3,668	-4,245
ISCED 5–8	-1,773	-2,141	-2,517
Total	**-5,819**	**-6,939**	**-8,080**
Yearly	**-388**	**-463**	**-539**

	A1	A2	A3
	Percentage composition by educational level		
ISCED 0–2	16.2	16.3	16.3
ISCED 3–4	53.3	52.9	52.5
ISCED 5–8	30.5	30.9	31.1
Total	**100**	**100**	**100**

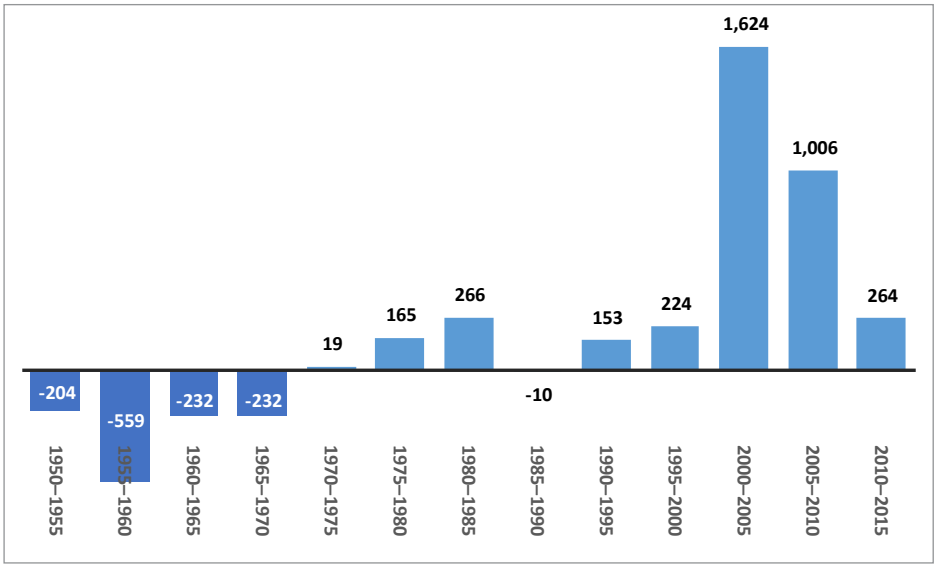
These data suggest the following observations:

- The three scenarios of labour needs obtained with the flow methodology corresponds quite closely to the intermediate scenarios computed with the stock methodology and therefore support the previous conclusions on the extremely important role that immigration will have to play;
- The need of foreign labour increases with the size of the demand and will range from 388,000 and 539,000 workers per year that represent between 38.3 per cent to 43.6 per cent of the labour demand in terms of flow; and
- The educational level of the immigrants needed by the German economy will be quite high and not too far from the average level of present employment.

ITALY

As shown by the following graph, Italy has been an emigration country until the middle of the 1970s to then become an immigration country with relevant inflows starting in the 1990s. Therefore, it should not come as a surprise if Italy will need foreign labour also in the next 15 years, especially if the economic downturn that has affected the country following the international financial crisis will come to an end.

Graph I1. Italy's migration balance; five-year values in thousands (1950–1955 to 2010–2015)



Source: UN DESA, 2015.

The labour market: A background analysis

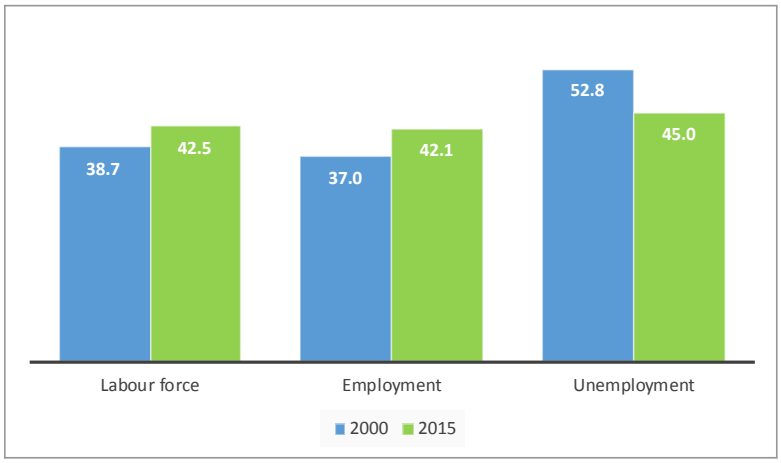
Stock analysis. In 2015, Italy's labour market was not yet out from the international financial crisis and still far from having totally absorbed its consequences. However, in spite of the big downturn in employment registered starting in 2008, a long-run perspective shows that from 2000 to 2015 employment increased by 1.35 million (+6.6%), labour force by 1.8 million, while unemployment increased by almost half a million (+19.3%), passing the 3-million mark (Table I1). Finally, immigration flows were sufficient to cause a small increase in WAP (+1%), more than counterbalancing the negative natural balance that had affected the population in working age.

Table I1. Main labour variables by sex; total and by educational level (2000 and 2015); absolute and percentage change (2000 to 2015)

		2000			2015			2000–2015					
		Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
		Absolute values						Absolute change			Percentage change		
All levels	WAP	19,232	19,411	38,644	19,414	19,621	39,035	182	209	391	0.9	1.1	1.0
	Labour force	14,188	8,968	23,156	14,382	10,615	24,997	194	1,647	1,841	1.4	18.4	8.0
	Employment	12,992	7,628	20,620	12,718	9,255	21,973	-274	1,627	1,353	-2.1	21.3	6.6
	Unemployment	1,196	1,340	2,536	1,664	1,361	3,025	468	20	488	39.1	1.5	19.3
ISCED 0–2	WAP	10,661	10,790	21,443	8,528	7,816	16,344	-2,133	-2,974	-5,099	-20.0	-27.6	-23.8
	Labour force	7,204	3,370	10,573	5,453	2,745	8,198	-1,751	-626	-2,376	-24.3	-18.6	-22.5
	Employment	6,500	2,772	9,254	4,623	2,270	6,893	-1,877	-502	-2,361	-28.9	-18.1	-25.5
	Unemployment	703	599	1,319	830	475	1,304	126	-124	-15	18.0	-20.7	-1.1
ISCED 3–4	WAP	6,987	7,097	14,090	8,303	8,347	16,650	1,316	1,249	2,560	18.8	17.6	18.2
	Labour force	5,546	4,380	9,927	6,673	5,159	11,831	1,126	778	1,904	20.3	17.8	19.2
	Employment	5,115	3,743	8,877	5,967	4,504	10,471	852	762	1,594	16.7	20.4	18.0
	Unemployment	432	638	1,051	706	654	1,360	274	17	310	63.6	2.6	29.5
ISCED 5–8	WAP	1,583	1,523	3,109	2,583	3,458	6,041	999	1,935	2,932	63.1	127.1	94.3
	Labour force	1,438	1,217	2,655	2,257	2,712	4,968	819	1,494	2,313	56.9	122.7	87.1
	Employment	1,377	1,111	2,488	2,128	2,480	4,608	751	1,369	2,121	54.6	123.3	85.2
	Unemployment	61	107	168	129	231	360	68	125	192	110.8	116.9	114.7

The dynamic of the female component has been much more pronounced than that of men, with women's labour force and employment growing by the same amount (little more than 1.6 million) and leaving the number of women unemployed almost constant (+20,000). On the other hand, men's employment declined by 274,000, with labour force increasing by almost 194,000. As a consequence, the increase in unemployment affected almost only the male component of the labour force (Graph I2).

Graph I2. Labour force, employment and unemployment: Percentage of female (2010 and 2015)



The result of the previous trends was an increase of the the RoA of 4.1 percentage points, of the RoE of 2.9 points, and of the RoU of 1.1 percentage points. Also, the main labour market indicators clearly show the different behaviour of men and women. In the case of women, the RoA and the RoE increased both by 7.9 percentage points, while the RoU declined by 2.1 percentage points; in the case of men, the RoE declined by 2 percentage points, the RoA increased by 0.3 percentage points and the RoU by 3.1 percentage points (Table I2).

Table I2. Main labour indicators by sex and educational level (2000 and 2015) and absolute change (2000 to 2015)

		2000			2015			2000–2015		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
All levels	RoA	73.8	46.2	59.9	74.1	54.1	64.0	0.3	7.9	4.1
	RoE	67.6	39.3	53.4	65.5	47.2	56.3	-2.0	7.9	2.9
	RoU	8.4	14.9	11.0	11.6	12.8	12.1	3.1	-2.1	1.1
ISCED 0–2	RoA	67.6	31.2	49.3	63.9	35.1	50.2	-3.6	3.9	0.8
	RoE	61.0	25.7	43.2	54.2	29.0	42.2	-6.8	3.4	-1.0
	RoU	9.8	17.8	12.5	15.2	17.3	15.9	5.5	-0.5	3.4
ISCED 3–4	RoA	79.4	61.7	70.5	80.4	61.8	71.1	1.0	0.1	0.6
	RoE	73.2	52.7	63.0	71.9	54.0	62.9	-1.3	1.2	-0.1
	RoU	7.8	14.6	10.6	10.6	12.7	11.5	2.8	-1.9	0.9
ISCED 5–8	RoA	90.8	80.0	85.4	87.4	78.4	82.2	-3.4	-1.5	-3.2
	RoE	87.0	73.0	80.0	82.4	71.7	76.3	-4.6	-1.2	-3.7
	RoU	4.2	8.8	6.3	5.7	8.5	7.2	1.5	-0.2	0.9

A major consequence of these trends was a notable decline in the gender differentials that remained however extremely large when compared with those of other European Union countries, the RoA and RoE of men exceeding those of women by 20 and 18.3 percentage points respectively, while the RoU of women remained higher, but the difference with that of men declined from 6.5 to 1.2 percentage points.

Another very relevant trend of this period was the improvement in the educational level of the people in working age, labour force and employment. Starting from the demand side, the increase in the employment level was the result, on the one hand, of the decrease of almost 2.4 million people with low education (-13.5%), and, on the other hand, of the increase of 1.6 million people with an intermediate educational level (4.6%) and of 2.1 million with high education (8.9%). Very similar trends characterize the labour force.

However, in 2015, still almost one third of the labour force and of the employed had a low educational level and around 47 per cent had an intermediate educational level. In the case of the employed, the percentage of those with high education had, however, increased above the 20 per cent mark. It should be underlined that the educational attainment of women was notably higher

than that of men, for what relates both to labour force and employment, so much that the percentage of women in employment with high education was equal to 26.8 per cent versus a percentage of 16.7 for men. It can finally be observed that the percentage of people with high education in employment was higher than that in labour force, both for women and men.

Table I3. Main economic variables; percentage composition by sex and educational level; 2000–2015 and difference

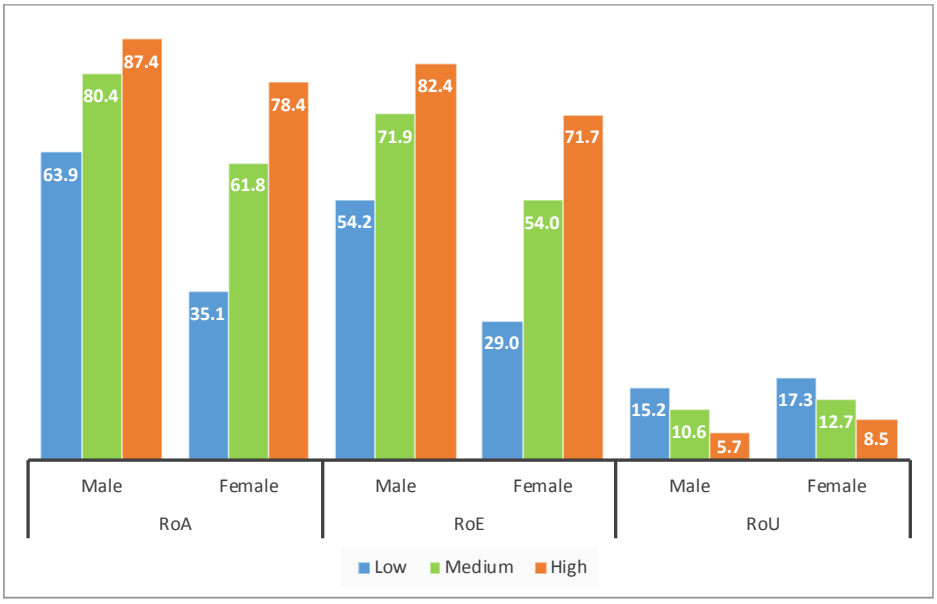
	2000			2015			2000–2015		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
	WAP								
Low	55.4	55.6	55.5	43.9	39.8	41.9	-11.5	-15.8	-13.6
Medium	36.3	36.6	36.5	42.8	42.5	42.7	6.4	6.0	6.2
High	8.2	7.8	8.0	13.3	17.6	15.5	5.1	9.8	7.4
	Labour force								
Low	50.8	37.6	45.7	37.9	25.9	32.8	-12.9	-11.7	-12.9
Medium	39.1	48.8	42.9	46.4	48.6	47.3	7.3	-0.2	4.5
High	10.1	13.6	11.5	15.7	25.5	19.9	5.6	12.0	8.4
	Employment								
Low	50.0	36.3	44.9	36.4	24.5	31.4	-13.7	-11.8	-13.5
Medium	39.4	49.1	43.1	46.9	48.7	47.7	7.5	-0.4	4.6
High	10.6	14.6	12.1	16.7	26.8	21.0	6.1	12.2	8.9
	Unemployment								
Low	58.8	44.6	52.0	49.8	34.9	43.1	-9.0	-9.7	-8.9
Medium	36.1	47.5	41.4	42.4	48.1	45.0	6.3	0.6	3.6
High	5.1	7.9	6.6	7.7	17.0	11.9	2.6	9.1	5.3

Regarding unemployment, a few observations are in order. In the first place, in 2000, the absolute majority of the unemployed had a low educational level (52%), followed by those with intermediate educational level (41.4%), while only 6.6 per cent had high education. As already seen, in the following 15 years, the average level of education increased in all the sub-populations that are being considered. Therefore, it was to be expected that this would happen also for unemployment. As a matter of fact, the number of unemployed with the lowest educational level remained substantially constant, but their share declined to 43.1 per cent. The largest group became that with intermediate education that grew to 45 per cent. Also, in this case, the educational level of women was higher than that of men, while the percentage of unemployed with high education reached 11.9 per cent.

The main indicators by educational level confirm two well-known aspects of labour force participation: (a) the education-specific rates of activity and employment are positively related to the educational level; and (b) the range of women rates is wider than that of men, which means education makes a difference especially for women. As shown by Graph I3, men's rates of participation range from 63.9 per cent to 87.4 per cent and those of women form 35.1 per cent to 78.4 per cent, so that the gender differential is inversely related to education, ranging from 28.8 to 9 percentage points.

The RoUs present, on the contrary, an inverse relationship with education, being included between 15.2 to 5.7 per cent for men and between 17.3 to 8.5 per cent for women. This could be interpreted as confirming that education makes a difference and it pays to study; however, it seems more probable that this indicates that people with high education are becoming a scarce resource.

Graph I3. Main labour market indicators by educational level (2015)



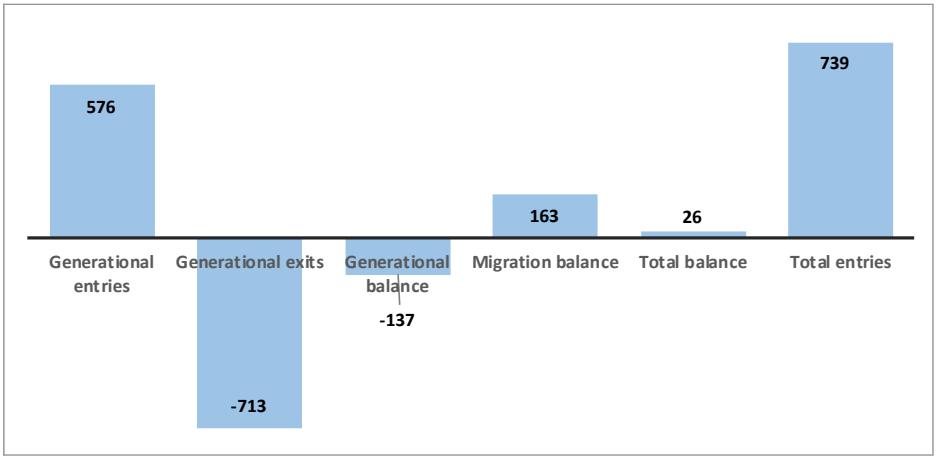
Generational flow analysis. Between 2000 and 2015, WAP has been affected by a natural decline of more than 2 million due to the interaction of generational entries and exits, which has been completely offset by a positive migration balance that is estimated at around 2.5 million. Taking into consideration natural entries and the migration balance, total entries into working age amount to around 11 million (Table I4).

Table I4. WAP; generational flows (2000–2015)

	2000–2005			2005–2010			2010–2015			2000–2015		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Generational entries	1,457	1,388	2,845	1,511	1,423	2,934	1,478	1,387	2,865	4,446	4,198	8,644
Generational exits	-1,850	-1,817	-3,631	-1,632	-1,694	-3,318	-1,850	-1,919	-3,752	-5,331	-5,430	-10,701
Generational balance	-393	-429	-786	-121	-271	-384	-372	-531	-887	-886	-1,231	-2,057
Migration balance	217	274	456	446	661	1,099	405	505	893	1,067	1,441	2,448
Total balance	**-176**	**-154**	**-330**	**325**	**390**	**715**	**32**	**-26**	**6**	**182**	**209**	**391**
Total entries	**1,674**	**1,662**	**3,301**	**1,957**	**2,084**	**4,033**	**1,882**	**1,893**	**3,758**	**5,513**	**5,639**	**11,092**

Translating these data on yearly average values (Graph I4), generational entries into WAP have been equal to 576,000 and generational exits to -713,000. This has generated a negative generational balance of -137,000, which has been more than counterbalanced by a migration balance of 163,000. So the total entries into WAP have been equal to 739,000, and this has resulted in an extremely modest increase of 26,000 people per year.

Graph I4. WAP; yearly average generational flows in the period 2000–2015



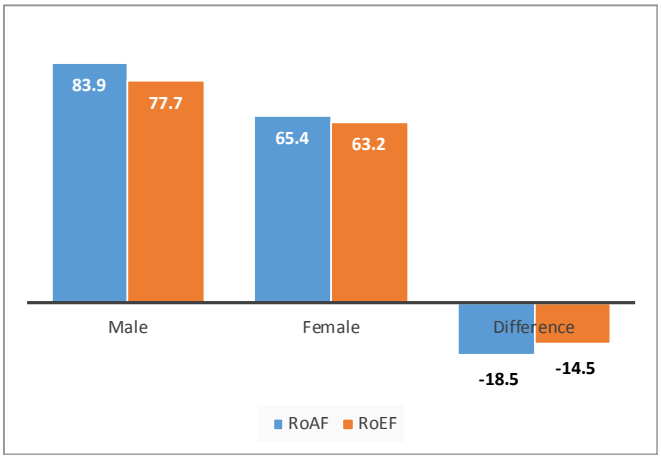
In the same period, total entries into labour force and employment were equal to 8.3 and 7.8 million. which translated into average yearly values of 554,000 and 523,000 and in a total RoAF of 75 per cent and RoEF of 70.8 per cent. The success rate was therefore of 94.4 per cent. Notable differences exist, however, between the flow rates of men and women.

Table I5. Labour force and employment – Net generational flows (2000–2015)

	2000–2005			2005–2010			2010–2015			2000–2015		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
	Labour force											
Entries	1,689	1,357	3,046	1,434	1,081	2,516	1,503	1,253	2,755	4,627	3,691	8,317
Exits	-1,663	-606	-2,269	-1,480	-766	-2,246	-1,290	-672	-1,961	-4,433	-2,044	-6,476
Balance	**27**	**751**	**778**	**-46**	**315**	**270**	**213**	**581**	**794**	**194**	**1,647**	**1,841**
	Employment											
Entries	1,935	1,658	3,593	1,271	1,038	2,309	1,080	868	1,949	4,286	3,565	7,850
Exits	-1,457	-483	-1,940	-1,507	-711	-2,218	-1,451	-677	-2,128	-4,415	-1,871	-6,286
Balance	**478**	**1,176**	**1,653**	**-236**	**327**	**91**	**-371**	**191**	**-179**	**-129**	**1,694**	**1,565**
RoAF	100.9	81.6	92.3	73.3	51.9	62.4	79.8	66.2	73.3	83.9	65.4	75.0
RoEF	115.6	99.7	108.8	64.9	49.8	57.2	57.4	45.9	51.8	77.7	63.2	70.8
Rate of success	**114.5**	**122.2**	**118.0**	**88.6**	**96.0**	**91.8**	**71.9**	**69.3**	**70.7**	**92.6**	**96.6**	**94.4**

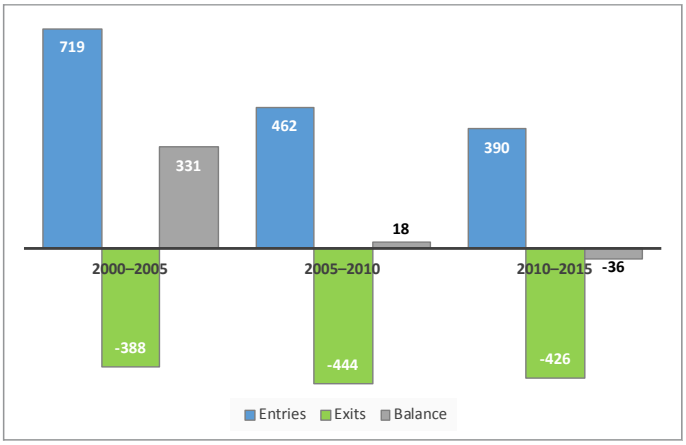
Between 2000 and 2015, 83.9 per cent of the young men that entered WAP did also enter the labour force, but only 77.7 per cent succeeded in finding a job; the corresponding values for women were 65.4 and 63.2. Therefore, the propensity of women to enter the labour market was still much lower than that of men (Graph I5), but their rate of success was higher: 96.6 per cent versus 92.6 per cent.

Graph I5. Rates of activity and rates of employment in terms of flow by sex and gender differentials (2000–2015)



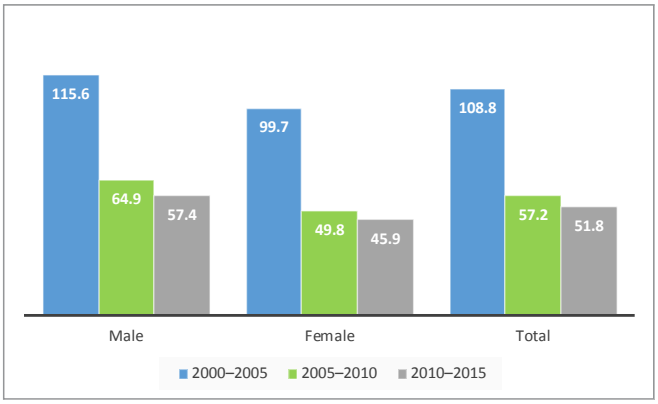
Starting in 2008, the Italian labour market felt the impact of the financial crisis in a very pronounced way. This is clearly shown by the progressive decline of the yearly entries into employment from 719,000 to 462,000 to 390,000, while exits remained rather stable ranging from 388,000 to 444,000 to 426,000. It was therefore the negative dynamic of the demand in terms of flow that caused the progressive decline of the employment balance from a highly positive value in the first five-year period to a negative value in the third. The percentage of women over total entries declined, but only marginally, remaining above 44 per cent, a value higher than women percentage in terms of stock.

Graph I6. Employment: Generational entries, exits and balance (2000–2005, 2005–2010, 2010–2015)

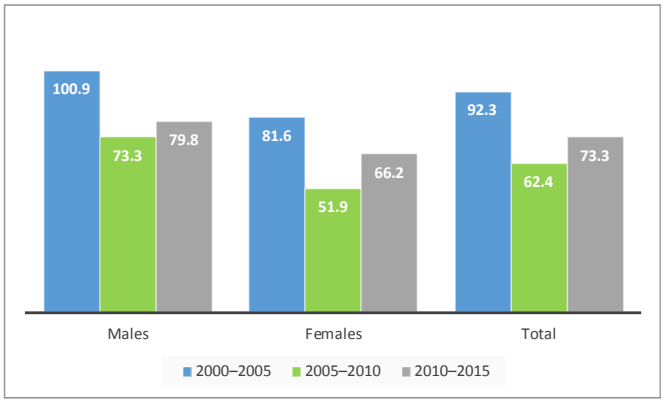


These trends are well captured by the RoE in terms of flow. The total RoE declined from 108.8 per cent, a value that implies that entries into employment were higher than those in WAP (including the contribution of the migrants), to a value of 57.2 and then to 51.8 per cent. The rates of men and women followed the same trend, with those of men being always higher, but the gender differential declined in a rather pronounced way (Graph I7).

Graph I7. RoE and RoA in terms of flow by sex (2000–2005, 2005–2010, 2010–2015)



Graph I7a. RoE



Graph I7b. RoA

The gross flows inclusive of inter-educational level passages allow estimating the structure of entries into employment (Table I6) and into labour force (Table I7) by educational level. Starting from the average values of the labour demand in terms of flow over the 15-year period, it can be observed that:

(a) More than one third of entries into employment was represented by people with high education, 19.6 per cent by people with low education and 46.1 per cent by people with intermediate education;
(b) The average educational level of the women that entered the employment area was much higher than that of men, so much so that those with high education represented 43.8 per cent, while the percentage of men was only 26.3 per cent; and
(c) For both men and women, the average educational level of entries into labour force was higher than the average educational level of entries into employment.

Table I6. Employment: Gross entry flows, absolute values and percentage composition by educational level (2000–2015)

	2000–2005			2005–2010			2010–2015			2000–2015		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
	Absolute values											
ISCED 0–2	589	376	965	198	119	317	188	98	287	975	593	1,568
ISCED 3–4	935	726	1,641	763	431	1,170	572	314	886	2,270	1,471	3,697
ISCED 5–8	375	551	911	364	522	886	418	533	949	1,157	1,606	2,746
Total	**1,899**	**1,653**	**3,517**	**1,325**	**1,072**	**2,373**	**1,178**	**946**	**2,122**	**4,402**	**3,670**	**8,011**
	Percentage composition											
ISCED 0–2	31.0	22.7	27.4	14.9	11.1	13.4	16.0	10.4	13.5	22.1	16.2	19.6
ISCED 3–4	49.3	43.9	46.7	57.6	40.2	49.3	48.5	33.2	41.8	51.6	40.1	46.1
ISCED 5–8	19.7	33.3	25.9	27.4	48.7	37.3	35.5	56.4	44.7	26.3	43.8	34.3
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Table I7. Labour force: Gross entry flows, absolute values and percentage composition by educational level (2000–2015)

	2000–2005			2005–2010			2010–2015			2000–2015		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
	Absolute values											
ISCED 0–2	499	270	710	248	115	353	336	213	517	1,083	598	1,580
ISCED 3–4	847	557	1,385	875	493	1,334	767	482	1,249	2,488	1,532	3,968
ISCED 5–8	391	580	960	378	539	915	460	613	1,072	1,228	1,732	2,946
Total	**1,737**	**1,408**	**3,055**	**1,500**	**1,146**	**2,602**	**1,562**	**1,308**	**2,837**	**4,800**	**3,862**	**8,494**
	Percentage composition											
ISCED 0–2	28.7	19.2	23.2	16.5	10.0	13.6	21.5	16.3	18.2	22.6	15.5	18.6
ISCED 3–4	48.8	39.6	45.3	58.3	43.0	51.3	49.1	36.8	44.0	51.8	39.7	46.7
ISCED 5–8	22.5	41.2	31.4	25.2	47.0	35.2	29.4	46.8	37.8	25.6	44.8	34.7
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

The decline in the number of total entries into employment that was previously observed affected mainly the people with low education (whose average yearly entries declined from 193,000 to 57,000) and people with intermediate education, whose entries declined from 328,000 to 177,000. On the contrary, entries by people with high education remained between 180,000 and 190,000. As a consequence, the entries' share of people with high reduction increased from 25.7 per cent to 44.7 per cent, while that of people with low education declined from 27.4 per cent to 13.5 per cent. It should be underlined that between 2010 and 2015, women with high education represented the absolute majority (56.4 per cent) of women entries. This seems to suggests that in a period of crisis companies tend to concentrate their demand on more qualified people or at least on people with more schooling. It remains to be seen if this reflects technological and organizational improvements or simply the possibility to hire at low wages people with high education.

A similar trend characterized the labour force. However, in this case, entries declined in the second period to then increase again in the third, with entries of people with low education following the same trend.

In conclusion, it should be underlined that over the 15-year period, the following main results have emerged:

(a) The average educational level of entries both into the labour force and employment progressively increased;
(b) The decline in labour demand has affected mostly the people with low education;
(c) Women entering the labour market and especially into employment have, on the average, a educational level higher than men.

The scenarios

The stock approach. In absence of migration, from 2015 to 2030, Italian WAP is expected to decline by 4.9 million (which corresponds to an average yearly rate of 326,000 people per year) down from 39 to 34.1 million (Table I8).

In order to evaluate the labour needs (that in the present analytic context are defined as the difference between the increase in supply and the increase in demand) the following assumptions are made:

For the labour force, two alternative scenarios are assumed:

(a) The rate of activity will progressively increase by the same percentage points as in the previous 15-year period (+4.1 percentage points); and
(b) The rate of activity will progressively increase by 6.2 percentage points, that is by 1.5 more percentage points than in the previous 15-year period.

For employment, three different situations will be considered. More specifically, employment will increase:

(a) At a rate equal to two thirds that registered between 2000 and 2015 (4.4% over the 15-year period);
(b) At a rate equal to that registered between 2000 and 2015 (6.6%); and
(c) At a rate equal to four thirds that registered between 2000 and 2015 (8.7%).

Table I8 shows the implications of these assumptions for labour force and employment. In Scenario A, labour force will decline by 1.7 million and in scenario B by 1 million, which correspond to average yearly values of -115,000 and -68,000 respectively. At the same time, employment is projected to increase in the three scenarios by around 1 million, 1.5 million and almost 2 million, the yearly average values being 65,000, 98,000 and 132,000.

Table I8. WAP, labour force and employment (2015) and in alternative hypothesis of labour force participation and employment growth (2020, 2025 and 2030); values in thousands

	WAP	Labour force		Employment		
		A	B	1	2	3
2015	39,035	24,997	24,997	21,973	21,973	21,973
2020	37,841	24,752	25,011	22,293	22,453	22,613
Difference	**-1,194**	**-245**	**14**	**320**	**480**	**641**
2025	36,379	24,294	24,793	22,618	22,944	23,272
Difference	**-1,463**	**-458**	**-218**	**325**	**491**	**659**
2030	34,147	23,272	23,975	22,947	23,446	23,951
Difference	**-2,232**	**-1,022**	**-819**	**330**	**502**	**678**
2015–2030	-4,888	-1,725	-1,022	975	1,473	1,978
Difference	**-326**	**-115**	**-68**	**65**	**98**	**132**

Crossing the two labour force scenarios with the three employment scenarios, six scenarios of labour needs and migration balance can be obtained. As already indicated, the labour shortage is computed as the difference between the change in labour supply (labour force) and labour demand (employment).

In the six scenarios thus obtained, labour needs range between a minimum of 2 million (Scenario B1) and a maximum of 3.7 million (Scenario A3). Assuming an elasticity of the migration balance to the labour needs of 1.3, an estimate of yearly migration balances between 173,000 and 321,000 per year can be obtained (Table I9). It is therefore evident that:

even under the most "favourable" conditions (an increase in the rate of activity of 6.2 percentage points and a modest expansion in employment equal to an average value of 0.3 per cent per year) migration will not be an option, but a necessity.

Table I9. Labour shortage and migration balance in six scenarios of labour participation and employment growth in the period 2015–2030

	A1	A2	A3	B1	B2	B3
	Labour shortage					
2015–2020	-565	-726	-886	-306	-466	-626
2020–2025	-782	-948	-1,117	-543	-709	-877
2025–2030	-1,352	-1,524	-1,701	-1,148	-1,320	-1,497
2015–2030 (Total)	**-2,700**	**-3,198**	**-3,703**	**-1,997**	**-2,495**	**-3,001**
2015–2030 (Yearly)	**-180**	**-213**	**-247**	**-133**	**-166**	**-200**
	Estimated migration balance					
2015–2020	735	943	1,151	398	606	814
2020–2025	1,017	1,233	1,452	706	922	1,140
2025–2030	1,758	1,981	2,211	1,493	1,716	1,946
2015–2030 (Total)	**3,510**	**4,157**	**4,814**	**2,596**	**3,244**	**3,901**
2015–2030 (Yearly)	**234**	**277**	**321**	**173**	**216**	**260**

Table I10 shows that once migration is linked to labour needs, the decline in WAP will be much more limited, the decline being inversely related to employment growth; at the same time, labour force will increase, the growth being positively related to employment expansion and inversely related to the rate of participation. Unemployment, as well as the RoU, are projected to decline in all scenarios, the improvement being directly related to employment expansion and inversely related to the increase in the rate of activity.

Table I10. Main labour market variables and main labour market indicators in 2015 and in six scenarios of labour force participation and employment growth in 2030

	WAP	Labour force	Employment	Unemployment	RoA	RoE	RoU
	2015						
	39,035	24,997	21,973	3,025	64.0	56.3	12.1
	2030						
A1	37,656	25,664	22,947	2,717	68.2	60.9	10.6
A2	38,304	26,105	23,446	2,660	68.2	61.2	10.2
A3	38,961	26,553	23,951	2,602	68.2	61.5	9.8
B1	36,743	25,798	22,947	2,850	70.2	62.5	11.0
B2	37,390	26,252	23,446	2,807	70.2	62.7	10.7
B3	38,047	26,714	23,951	2,763	70.2	63.0	10.3

Labour needs by educational level. The previous analysis in terms of flows has allowed to estimate the flow labour demand and flow labour supply and to estimate their structure by educational level over the 2000–2015 period. This approach provides a way to estimate scenarios of the future labour demand in terms of flow that will be expressed by the Italian economic system and the future labour supply that will be generated by the people present in Italy in 2015, both by educational level. The labour needs in alternative hypotheses of employment growth and participation can then be computed. To carry on this exercise, a series of additional assumptions are needed.

(a) In the 2015–2030 period, entries in WAP will be equal to the number of young people that were in the 0–14 age bracket in 2015.
(b) Regarding the labour force, two scenarios are built to assume that the percentage of entries into the labour force with respect to the entries into WAP (RoAF) will be equal to that registered between 2000 and 2015 (75%) and that registered by men in the same period (83.9%).
(c) The labour demand in terms of flow is equal to the sum of the replacement demand and the additional demand.

To compute the labour demand in terms of flow, it is assumed that:

(a) The replacement demand will be equal to the number of the employed in the 50–64 age bracket in 2015, which will necessarily exit the labour market for age-related reasons; and

(b) The additional demand will be taken equal to the values used in the stock scenarios for employment growth.

This process does produce two estimates of labour supply in terms of flow and three estimates of labour demand in terms of flow that are shown, together with the estimate of the entries into WAP, in Table I11.

A simple inspection of the data shows that:

(a) All additional jobs created by the economy will have to be covered by foreign workers;
(b) Generational exits from employment are higher than generational entries into the labour force, the implication being that in both scenarios of labour force participation, the young people that will enter the labour market will not be sufficient to replace those that will exit from employment;
(c) In two employment scenarios, entries into employment not only are higher than entries into labour force, but also of the entries into WAP.

Table I11. Entries into WAP, labour force and employment in alternative scenarios (2015–2030)

Entries into WAP		Entries into labour force		Entries into employment		
				Replacement demand	Additional demand	Labour demand in terms of flow
15-year values						
8,198	A	6,147	1	6,922	975	7,897
	B	6,880	2		1,473	8,395
			3		1,978	8,901
Average yearly values						
547	A	410	1	461	65	526
	B	459	2		98	560
			3		132	593

Finally, concerning the percentage share of the three educational levels of labour supply and labour demand that were assumed, in a conservative vein, that in the next 15 years, the structure of entries into labour force and employment will have the same structure as the one registered in the previous 15 (Graph I8). This hypothesis is justified by the consideration that the strong trends detected in the 2000–2015 period could be more the result of cyclical oscillations than of structural trends. It should also be underlined that the average educational level of the demand in terms of flow is higher than that of the supply in terms of flow.

Graph I8. Projected shares of educational levels for the labour supply and the labour demand in terms of flows; average values for the period 2015–2030

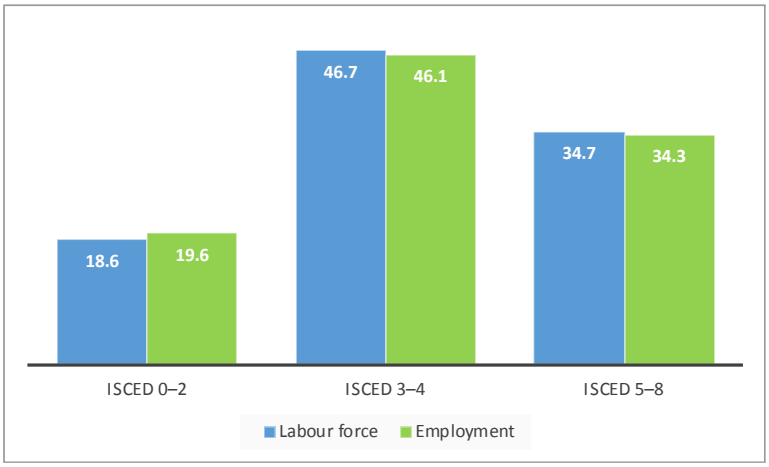


Table I12 reports the entries in labour force and employment by educational level in alternative hypotheses of labour force participation and (employment) growth.

Table I12. Entries into labour force and employment by educational level in alternative scenarios (2015–2030); absolute values in thousands

	Labour supply in terms of flow in alternative scenarios		Labour demand in terms of flow in alternative scenarios		
	A	B	1	2	3
ISCED 0–2	1,144	1,280	1,546	1,643	1,742
ISCED 3–4	2,871	3,214	3,644	3,874	4,108
ISCED 5–8	2,132	2,386	2,707	2,878	3,051
Total	**6,147**	**6,880**	**7,897**	**8,395**	**8,901**
Yearly	**410**	**459**	**526**	**560**	**593**

Finally, the labour needs were computed as the difference between the labour supply and the labour demand in terms of flows for each educational level as well as the share of each educational level on total demand (Table I13).

Table I13. Labour needs by educational level in three scenarios of employment growth; total values and percentage composition; 2015–2030

	Labour needs in alternative scenarios					
	A1	A2	A3	B1	B2	B3
	Absolute values					
ISCED 0–2	-402	-500	-599	-266	-363	-462
ISCED 3–4	-773	-1,003	-1,236	-431	-661	-894
ISCED 5–8	-575	-745	-919	-321	-491	-664
Total	**-1,750**	**-2,248**	**-2,753**	**-1,017**	**-1,515**	**-2,021**
Yearly	**-117**	**-150**	**-184**	**-68**	**-101**	**-135**

	Percentage composition by educational level					
	LN1	LN2	LN3	LN1	LN2	LN3
ISCED 0–2	23.0	22.2	21.7	26.1	24.0	22.9
ISCED 3–4	44.2	44.6	44.9	42.3	43.6	44.2
ISCED 5–8	32.8	33.2	33.4	31.5	32.4	32.9
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

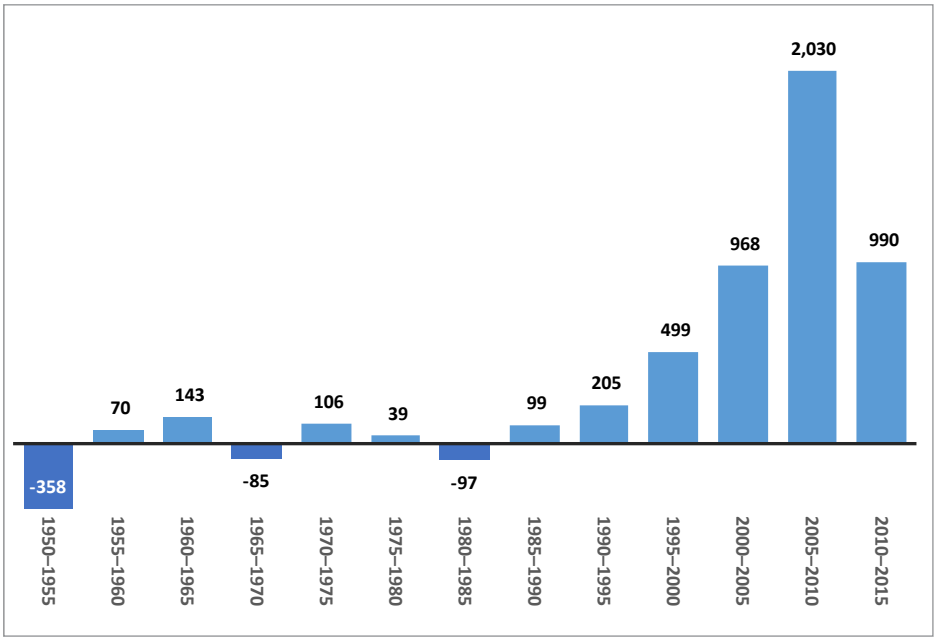
Starting from the total, it can be observed that the values are smaller than that computed in the stock scenarios ranging from a minimum of around 1 million to a maximum of 2.8 million, that is from around 68,000 to 184,000 per year. This result depends on the characteristics of the flow approach that compares only generational entries into labour force and employment and does not consider unbalances that can be derived from the behaviour of the people already in the labour force.

Regarding the structure of labour needs by educational level, the computations show that a little more than 20 per cent should have a low educational level, while around one third should be highly educated. The most numerous group remains that of people with middle level of education (43–45%). Finally, it is observed that the rate of growth of employment is negatively related to the percentage of people with low education, while positively related to the shares of people with middle and high educational levels.

UNITED KINGDOM

As shown by the following graph, since 1955, the United Kingdom has always been an arrival country, with very minor exceptions (Graph UK1). Therefore, it can safely be expected that the United Kingdom will need foreign labour also in the 2015–2030 period, unless its economy that has nor been especially affected by the international financial crisis will suffer from the exit from the European Union.

Graph UK1. United Kingdom's migration balance; five-year values in thousands (from 1950–1955 to 2010–2015)



The labour market: A background analysis

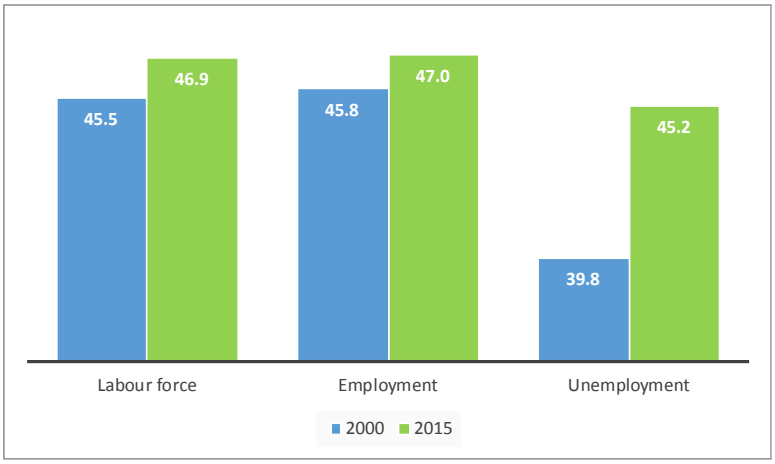
Stock analysis. In the United Kingdom, from 2000 to 2015, employment increased by 3.2 million (+12%), labour force by 3.35 million (+11.8%) and therefore unemployment did expand by only 130,000 (+8.1%) up to 1.73 million (Table UK1). Finally, WAP grew by 3.54 million (+9.4%).

Table UK1. Main labour variables by sex; total and by educational level (2000 and 2015); absolute and percentage change (2000 to 2015)

		2000			2015			2000–2015					
		Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
		Absolute values						Absolute change			Percentage change		
All levels	WAP	18,697	19,052	37,750	20,501	20,790	41,291	1,804	1,738	3,541	9.6	9.1	9.4
	Labour force	15,481	12,920	28,401	16,849	14,905	31,754	1,368	1,985	3,353	8.8	15.4	11.8
	Employment	14,519	12,286	26,805	15,903	14,125	30,028	1,384	1,839	3,223	9.5	15.0	12.0
	Unemployment	962	635	1,597	946	781	1,727	-16	146	130	-1.6	23.0	8.1
ISCED 0–2	WAP	5,537	8,198	13,539	4,161	4,280	8,649	-1,377	-3,918	-4,890	-24.9	-47.8	-36.1
	Labour force	4,074	4,657	8,736	2,899	2,218	5,066	-1,176	-2,438	-3,670	-28.9	-52.4	-42.0
	Employment	3,613	4,335	7,955	2,600	2,004	4,590	-1,013	-2,331	-3,365	-28.0	-53.8	-42.3
	Unemployment	461	322	780	298	214	476	-163	-107	-305	-35.3	-33.4	-39.1
ISCED 3–4	WAP	8,269	6,385	14,844	9,092	8,495	17,561	823	2,110	2,717	9.9	33.0	18.3
	Labour force	6,924	4,602	11,521	7,349	5,976	13,178	425	1,374	1,657	6.1	29.9	14.4
	Employment	6,554	4,377	10,924	6,901	5,606	12,480	346	1,229	1,555	5.3	28.1	14.2
	Unemployment	370	225	597	448	370	698	79	145	101	21.2	64.3	17.0
ISCED 5–8	WAP	4,886	4,282	9,233	7,249	8,016	15,265	2,363	3,733	6,033	48.4	87.2	65.3
	Labour force	4,474	3,659	8,133	6,601	6,711	13,312	2,127	3,052	5,179	47.5	83.4	63.7
	Employment	4,345	3,571	7,917	6,402	6,511	12,913	2,057	2,939	4,996	47.3	82.3	63.1
	Unemployment	129	87	216	199	200	399	70	113	183	54.2	129.4	84.5

The dynamic of the female component has been much more pronounced than that of men: the number of women in employment grew by 15 per cent and in labour force by 15.4 per cent; the corresponding values for men were 9.5 and 8.8 per cent. In spite of this, women's unemployment did slightly increase (+146,000), while the number of unemployed men declined by 16,000. The presence of women in employment and labour force has continued to increase getting close to the parity with men. Unfortunately, the same tendency is present also in unemployment where the percentage of women increased from 39.8 per cent to 45.2 per cent (Graph UK2).

Graph UK2. Labour force, employment and unemployment: Percentage of women (2010 and 2015)



The result of the previous trends was an increase of both the RoA and the RoE by 1.7 percentage points, while the RoU declined by 0.2 percentage points. Also, the main labour market indicators clearly show the different trends in the presence of women and men in the labour market. In the case of women, the RoA and the RoE increased respectively by 3.9 and 3.5 percentage points, while the rate of unemployment increased by only 0.3 percentage points; in the case of men, the RoE declined by 0.1 percentage points, the RoA and the RoU by 0.6 percentage points (Table UK2). Therefore all gender differentials declined: in 2000, men's RoA and RoE exceeded those of women by 15 and 13.2 percentage points; in 2015, the difference was 10.5 and 9.6. Concerning the RoU, in 2015, the distance was down to 0.4 percentage points.

Table UK2. Main labour indicators by sex and educational level (2000 and 2015) and absolute change (2000 to 2015)

		2000			2015			2000–2015		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
All levels	RoA	82.8	67.8	75.2	82.2	71.7	76.9	-0.6	3.9	1.7
	RoE	77.7	64.5	71.0	77.6	67.9	72.7	-0.1	3.5	1.7
	RoU	6.2	4.9	5.6	5.6	5.2	5.4	-0.6	0.3	-0.2
ISCED 0–2	RoA	73.6	56.8	64.5	69.7	51.8	58.6	-3.9	-5.0	-6.0
	RoE	65.3	52.9	58.8	62.5	46.8	53.1	-2.8	-6.1	-5.7
	RoU	11.3	6.9	8.9	10.3	9.7	9.4	-1.0	2.8	0.5
ISCED 3–4	RoA	83.7	72.1	77.6	80.8	70.3	75.0	-2.9	-1.7	-2.6
	RoE	79.3	68.5	73.6	75.9	66.0	71.1	-3.4	-2.6	-2.5
	RoU	5.3	4.9	5.2	6.1	6.2	5.3	0.8	1.3	0.1
ISCED 5–8	RoA	91.6	85.4	88.1	91.1	83.7	87.2	-0.5	-1.7	-0.9
	RoE	88.9	83.4	85.7	88.3	81.2	84.6	-0.6	-2.2	-1.2
	RoU	2.9	2.4	2.7	3.0	3.0	3.0	0.1	0.6	0.3

Another very relevant trend registered in this period is the improvement in the educational level of the people in working age, labour force and employment. Starting from the demand side, the increase in the employment level was the result, on the one hand, of the decrease of 3.4 million people with low education (-42.3%), and, on the other hand, the increase of 1.6 million people with intermediate education (14.2%), but especially of 5 million with high education (63.1%). Very similar trends characterized the labour force.

Table UK3. Main economic variables; percentage composition by sex and educational level (2010, 2015 and difference)

	2000			2015			2000–2015		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
	WAP								
Low	29.6	43.5	36.0	20.3	20.6	20.9	-9.3	-22.9	-15.1
Medium	44.2	33.8	39.5	44.3	40.9	42.3	0.1	7.0	2.9
High	26.1	22.7	24.5	35.4	38.6	36.8	9.2	15.9	12.3
	Labour force								
Low	26.3	36.1	30.8	17.2	14.9	16.1	-9.1	-21.2	-14.7
Medium	44.7	35.6	40.6	43.6	40.1	41.8	-1.1	4.5	1.2
High	28.9	28.3	28.6	39.2	45.0	42.2	10.3	16.7	13.5
	Employment								
Low	24.9	35.3	29.7	16.4	14.2	15.3	-8.5	-21.1	-14.4
Medium	45.2	35.6	40.8	43.4	39.7	41.6	-1.8	4.1	0.9
High	29.9	29.1	29.5	40.3	46.1	43.1	10.3	17.0	13.5
	Unemployment								
Low	48.0	50.7	49.0	31.5	27.3	30.3	-16.5	-23.4	-18.7
Medium	38.5	35.5	37.4	47.4	47.2	44.4	8.9	11.7	6.9
High	13.5	13.7	13.6	21.1	25.5	25.4	7.6	11.7	11.8

Therefore, if the employed are considered, in 2015, the most numerous education group was represented by people with high education that accounted for 43.1 per cent, followed by those with intermediate education (41.6%), with less than one out of seven employed having low educational level. While the educational structure of the labour force was very similar, albeit having a slightly lower average educational level, the average education level of WAP was quite lower, the most numerous group being represented by people with intermediate education (42.3%), followed by those with high education (36.8%), with the group with low education still above the 20 per cent mark (20.9%).

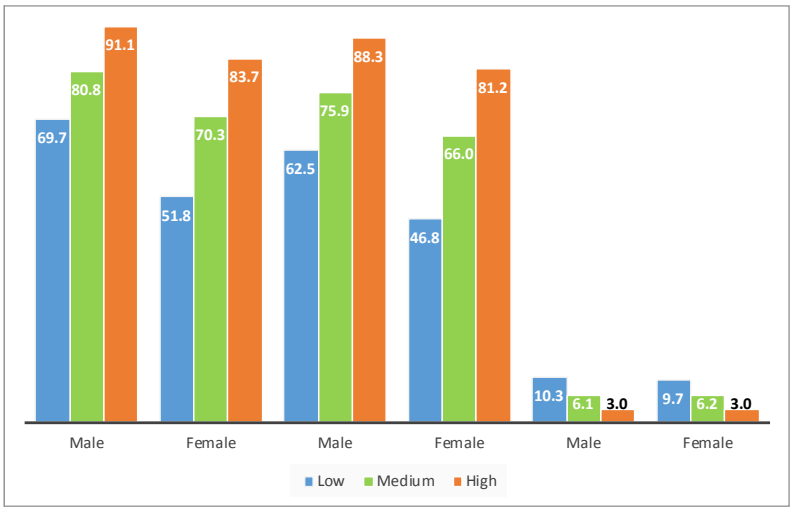
Concerning unemployment, a few observations are in order. In the first place, in 2000, the unemployed with low educational level were almost half of the total (49.0%), followed by those with an intermediate educational level (37.4%), while only 13.6 per cent of the unemployed had high educational level. As already seen, in the following 15 years, the average level of education increased in all labour market related sub-populations, and unemployment was not an exception. The increase in the stock of the unemployed was the result of a decline of those with low education and an increase of those with intermediate and high education. As a consequence, the share of the first group lost 18.7 percentage points and

declined to 30.3 per cent, while the shares of the other two groups increased respectively to 44.4 per cent and 25.4 per cent.

The main indicators by educational level confirm two well known aspects of labour force participation: (a) the education-specific rates of activity and employment are positively related to the educational level; and (b) the range of women's rates is wider than that of men, which means education makes a difference especially for women. As shown by Graph UK3, men's rates of participation range from 69.7.per cent to 91.1 per cent, and those of women from 51.8 per cent to 83.7 per cent so that the gender differential is inversely related to the education level, declining from 17.9 to 7.4 percentage points. The situation of the RoE is very similar.

The RoUs present, on the contrary, an inverse relationship with education, ranging from 10.3 per cent for men with low education to 3 per cent for men with high education, and from 9.7 to 3 per cent for women. This could be interpreted as confirming that education makes a difference and it pays to study, but could also suggest that people with high education are becoming the relatively more scarce resource on the British labour market.

Graph UK3. Main economic indicators by sex and educational level (2015)



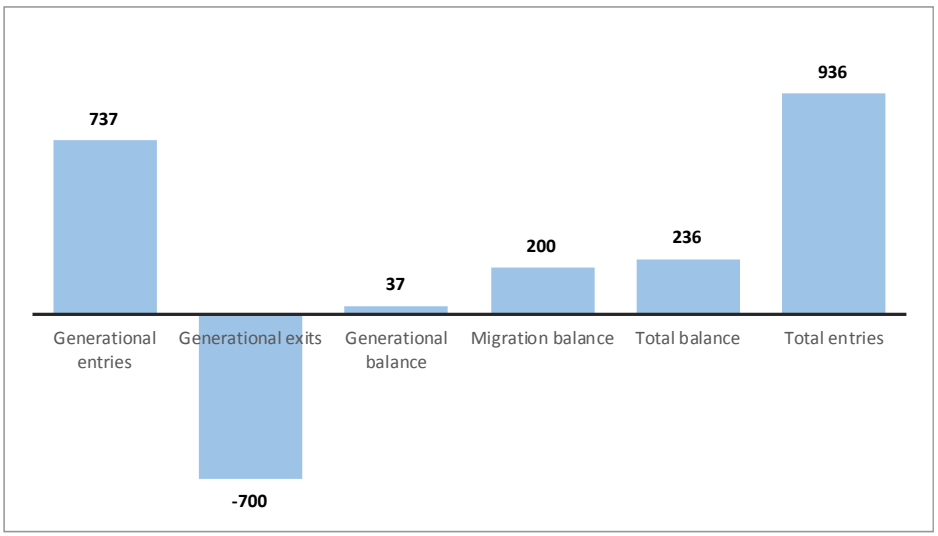
Generational flow analysis. Between 2000 and 2015, WAP has been affected by a natural increase of 548,000 people and a much more consistent migration balance that is estimated at almost 3 million. Taking into consideration natural entries and the migration balance, total entries into WAP amount to around 14 million.

Table UK4. WAP; generational flows (2000–2015)

	2000–2005			2005–2010			2010–2015			2000–2015		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Generational entries	1,873	1,820	3,693	1,911	1,870	3,781	1,829	1,748	3,577	5,613	5,439	11,051
Generational exits	-1,580	-1,603	-3,183	-1,678	-1,696	-3,368	-1,976	-1,977	-3,952	-5,234	-5,276	-10,503
Generational balance	293	217	510	232	175	413	-147	-229	-374	378	163	548
Migration balance	460	526	986	509	603	1,107	456	446	901	1,425	1,575	2,993
Total balance	**753**	**743**	**1,496**	**741**	**778**	**1,519**	**309**	**217**	**526**	**1,804**	**1,738**	**3,541**
Total entries	**2,333**	**2,345**	**4,679**	**2,420**	**2,474**	**4,888**	**2,285**	**2,194**	**4,478**	**7,038**	**7,013**	**14,044**

Translating these data on yearly average values (Graph UK4), generational entries into WAP have been equal to 737,000, and generational exits to 700.000. This has generated a very small positive natural generational balance of 37,000 which has been increased by a migration balance of 200,000. Therefore, average yearly entries into WAP have been equal to 936,000.

Graph UK4. WAP; yearly average generational flows in the period 2010–2015



At the same time, total entries into labour force and employment were equal to 11.7 and 11.2 million, which translated into average yearly values of 780,000 and 747,000 and in a total RoAF of 83.3 per cent and in a total RoEF of 79.8 per cent. The success rate was therefore of 95.7 per cent (Table UK5).

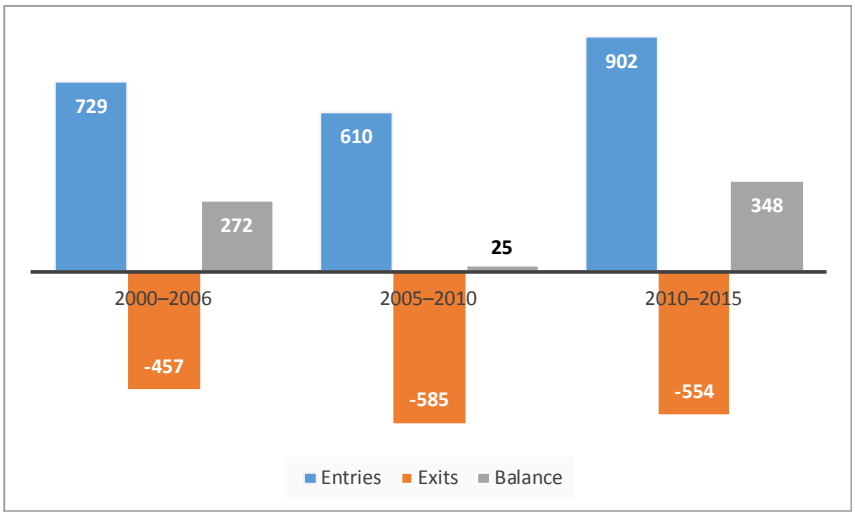
Table UK5. Labour force and employment – Net generational flows (2000–2015)

	2000–2005			2005–2010			2010–2015			2000–2015		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
	Labour force											
Entries	1,939	1,837	3,683	2,050	1,943	3,949	2,100	2,000	4,069	6,089	5,781	11,701
Exits	-1,459	-1,135	-2,500	-1,546	-1,305	-2,806	-1,717	-1,356	-3,042	-4,721	-3,796	-8,348
Balance	**481**	**703**	**1,183**	**505**	**639**	**1,144**	**383**	**644**	**1,027**	**1,368**	**1,985**	**3,353**
	Employment											
Entries	1,864	1,828	3,643	1,633	1,542	3,051	2,375	2,133	4,509	5,871	5,503	11,203
Exits	-1,252	-1,081	-2,285	-1,736	-1,312	-2,924	-1,499	-1,272	-2,770	-4,487	-3,664	-7,979
Balance	**611**	**747**	**1,358**	**-104**	**231**	**127**	**877**	**862**	**1,738**	**1,384**	**1,839**	**3,223**
RoAF	83.1	78.3	78.7	84.7	78.6	80.8	91.9	91.1	90.9	86.5	82.4	83.3
RoEF	79.9	77.9	77.9	67.5	62.4	62.4	104.0	97.2	100.7	83.4	78.5	79.8
Rate of success	**96.1**	**99.5**	**98.9**	**79.6**	**79.4**	**77.3**	**113.1**	**106.7**	**110.8**	**96.4**	**95.2**	**95.7**

The differences between the flow rates of men and women are quite limited. Between 2000 and 2015, 86.5 per cent of the young men that entered WAP did also enter the labour force, while the percentage of entries into employment was of 83.4 per cent; the corresponding rates for women were 82.4 per cent and 78.5 per cent. Therefore, not only men had a higher propensity to enter the labour market, but also a slightly higher rate of success (96.4 versus 95.2 per cent).[14]

The British labour market shows the impact of the financial crisis by a reduction of entries into and an increase in exits from employment during the 2005–2010 period. The general trend is however positive, with entries increasing from 729,000 in the first period to 902,000 in the last and the employment balance from 272,000 to 348,000 (Graph UK5).

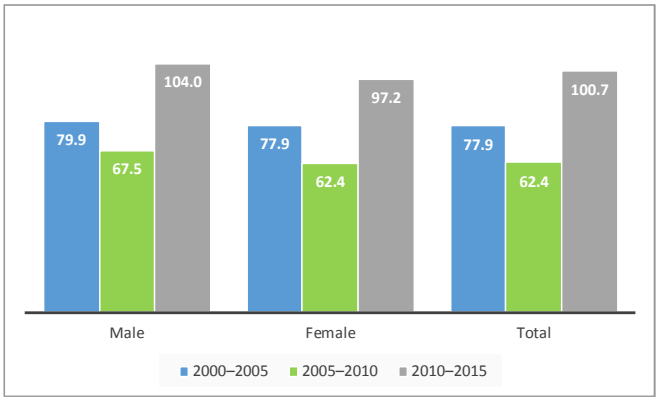
Graph UK5. Employment: Generational entries, exits and balance (2000–2005, 2005–2010, 2010–2015)



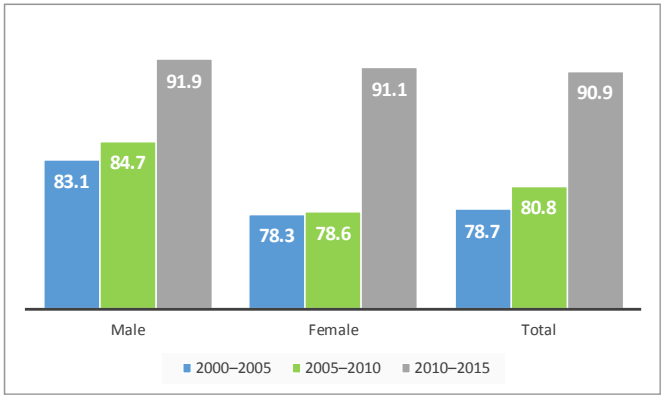
These trends are well captured by the RoEF. The total rate increases from 77.9 per cent to 100.7 (a value that implies that entries into employment were slightly higher than those in WAP, including the migration balance), with a value of 62.4 per cent in the intermediate period (Graph UK6a). Men's rates were higher than women's rates in every period, but both followed the same trend.

[14] This can be translated in an average unemployment duration of of 6.4 and 8.6 months.

Graph UK6. RoE and RoA in terms of flow by sex (2000–2005, 2005–2010, 2010–2015)



Graph UK6a. RoEF



Graph UK6b. RoAF

The RoAF follow a different pattern showing a moderate increase from the first to the second period and then registering a real jump in the third, in correspondence to the notable increase in demand registered in that phase (Graph UK6b). It should also be underlined that the 2010–2015 period was characterized by a negative natural balance that caused an average yearly decline of WAP of 75,000, while also the immigration balance declined with respect to the previous period.

The gross flows, inclusive of inter-educational level passages, allow providing some gross estimates of the structure of entries into labour force and employment by educational level (Table UK7). Starting from the average values of the labour demand in terms of flow over the 15-year period, it can be observed that:

(a) More than half (53.1%) of entries into employment was represented by people with high education, only a little less than 8 per cent by people with low education and 39.2 per cent by people with intermediate education;
(b) The average educational level of the women that entered the employment area was notably higher than that of men, so much so that 55.9 per cent of women that entered the employment area had high education, while the percentage of men was 49.1 per cent;
(c) For both men and women, the average educational level of entries into labour force has been lower than that of the entries into employment; and
(d) The average educational level of labour demand has progressively and notably increased: between 2000 and 2005 the percentage of newly hired with high education was 34.8 per cent; between 2010 and 2015 it reached 61.5 per cent; in all three periods, the average educational level of women remained higher than that of men.

Entries into employment declined in the second five-year period that is being considered, to then increase again in the third. A comparison between the first and the third period aiming to capture long-term trends shows that:

(a) Entries with low education declined so that their share decreased from 10.4 per cent to 6.9 per cent;
(b) Also, entries with intermediate education sharply declined, as well as the percentage share, which dropped from 54.8 to 31.6 per cent;
(c) Entries with high education doubled passing from 1.5 to 3 million and their share from 34.8 to 61.5 per cent; and
(d) The share of entries with high education reached a maximum of 52.6 per cent in the second period when they were the only ones whose demand expanded in spite of the recession.

In the case of labour supply, the level and share of the first two groups progressively decrease from each period to the next, while the opposite trend characterizes the people with high education (Table UK7).

Table UK6. Employment: Gross entry flows; absolute values and percentage composition by educational level (2000–2015)

	2000–2005			2005–2010			2010–2015			2000–2015		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
	Absolute values											
ISCED 0–2	261	191	453	130	98	227	227	118	344	618	407	1,024
ISCED 3–4	1,204	1,294	2,388	699	637	1,259	873	718	1,567	2,776	2,648	5,215
ISCED 5–8	651	912	1,514	1,157	1,373	2,493	1,468	1,583	3,051	3,276	3,868	7,058
Total	**2,116**	**2,397**	**4,355**	**1,987**	**2,107**	**3,979**	**2,568**	**2,419**	**4,963**	**6,671**	**6,923**	**13,296**
	Percentage composition											
ISCED 0–2	12.4	8.0	10.4	6.5	4.6	5.7	8.8	4.9	6.9	9.3	5.9	7.7
ISCED 3–4	56.9	54.0	54.8	35.2	30.2	31.6	34.0	29.7	31.6	41.6	38.3	39.2
ISCED 5–8	30.8	38.1	34.8	58.3	65.2	62.6	57.2	65.5	61.5	49.1	55.9	53.1
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Table UK7. Labour force: Gross entry flows; absolute values and percentage composition by educational level (2000–2015)

	2000–2005			2005–2010			2010–2015			2000–2015		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
	Absolute values											
ISCED 0–2	368	256	625	240	167	407	175	123	283	783	546	1,314
ISCED 3–4	1,229	1,342	2,441	906	824	1,592	925	756	1,656	3,060	2,921	5,689
ISCED 5–8	672	932	1,564	1,271	1,474	2,699	1,442	1,589	3,031	3,385	3,996	7,294
Total	**2,269**	**2,531**	**4,629**	**2,416**	**2,465**	**4,698**	**2,543**	**2,468**	**4,970**	**7,228**	**7,463**	**14,297**
	Percentage composition											
ISCED 0–2	16.2	10.1	13.5	9.9	6.8	8.7	6.9	5.0	5.7	10.8	7.3	9.2
ISCED 3–4	54.2	53.0	52.7	37.5	33.4	33.9	36.4	30.6	33.3	42.3	39.1	39.8
ISCED 5–8	29.6	36.8	33.8	52.6	59.8	57.4	56.7	64.4	61.0	46.8	53.5	51.0
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

In conclusion, it should be underlined that over the 15-year period, the following elements emerge:

(a) The average educational level of both entries into labour force and employment progressively increased; and
(b) The women entering the labour market and especially employment had on the average a higher educational level than men.

The scenarios: The stock approach

In absence of migration, from 2015 to 2030, the WAP of the United Kingdom is expected to decline by 1.1 million (which corresponds to a very modest average yearly rate of -75,000 people per year) down from 41.3 to 40.2 million (Table UK8).

In order to evaluate the labour needs (that in the present analytic context are defined as the difference between the increase in supply and the increase in demand), the following assumptions were made.

For the labour force, two alternative scenarios are assumed:

(a) The rate of activity will progressively increase by the same percentage points as in the previous 15-year period (+1.7 percentage points); and
(b) The rate of activity will progressively increase by 2.5 percentage points, that is by 1.5 more percentage points than in the previous 15-year period.

For employment, three different situations will be considered. More specifically, employment will increase:

(a) At a rate equal to two thirds that registered between 2000 and 2015 (8% over the 15-year period);
(b) At a rate equal to that registered between 2000 and 2015 (12%); and
(c) At a rate equal to four thirds that registered between 2000 and 2015 (16%).

The following table shows the implication of these assumptions for labour force and employment. In Scenario A, labour force will increase by 375,000 and in Scenario B by 1.379 million, which corresponds to average yearly values of 25,000 and 92,000 respectively. At the same time, employment is projected to increase in the three scenarios by around 2.2 million, 3.4 million and 4.5 million, the yearly average values being 147,000, 224,000 and 302,000.

Table UK8. WAP, labour force and employment (2015) and in alternative hypothesis of labour force participation and employment growth (2020, 2025 and 2030); values in thousands

	WAP	Labour force		Employment		
		A	B	1	2	3
2015	41,291	31,754	31,754	26,805	26,805	26,805
2020	40,999	31,758	31,872	27,521	27,879	28,237
Difference	**-292**	**4**	**118**	**716**	**1,074**	**1,433**
2025	40,849	31,869	32,096	28,256	28,996	29,746
Difference	**-150**	**111**	**224**	**735**	**1,117**	**1,509**
2030	40,161	31,556	31,891	29,011	30,159	31,336
Difference	**-687**	**-313**	**-205**	**755**	**1,162**	**1,590**
2015–2030	-1,129	-198	137	2,207	3,354	4,531
Difference	**-75**	**-13**	**9**	**147**	**224**	**302**

Crossing the two labour force scenarios with the three employment scenarios, six scenarios of labour needs and migration balance can be obtained. As already indicated, the labour shortage is computed as the difference between the change in labour supply (labour force) and labour demand (employment).

In the six scenarios thus obtained (Table UK9), labour needs range between a minimum of 2 million (Scenario B1) and a maximum of 4.7 million (Scenario A3). Assuming an elasticity of the migration balance to the labour needs of 1.3, an estimate of the yearly average migration balance between 179,000 and 410,000 can be obtained. It is therefore evident that even under the most "favourable" conditions (an increase in the rate of activity of 3.3 percentage points and a modest expansion in employment equal to an average value of 0.5% per year), migration will not be an option but a necessity.

Table UK9. Labour shortage and migration balance in six scenarios of labour participation and employment growth in the period 2015–2030

	A1	A2	A3	B1	B2	B3
	Labour shortage					
2015–2020	-713	-1,071	-1,429	-599	-957	-1,315
2020–2025	-625	-1,007	-1,398	-511	-893	-1,285
2025–2030	-1,068	-1,475	-1,902	-960	-1,367	-1,795
2015–2030 (Total)	**-2,405**	**-3,552**	**-4,730**	**-2,070**	**-3,217**	**-4,395**
2015–2030 (Yearly)	**-160**	**-237**	**-315**	**-138**	**-214**	**-293**

	A1	A2	A3	B1	B2	B3
	Estimated migration balance					
2015–2020	927	1,392	1,858	778	1,244	1,709
2020–2025	812	1,309	1,818	665	1,161	1,671
2025–2030	1,388	1,917	2,473	1,248	1,777	2,333
2015–2030 (Total)	**3,127**	**4,618**	**6,149**	**2,691**	**4,183**	**5,713**
2015–2030 (Yearly)	**208**	**308**	**410**	**179**	**279**	**381**

Table UK10 shows that once migration is linked to labour needs, WAP will not decline, but increase, the increase being positively related to employment growth; at the same time, labour force will increase, the growth being positively related to employment expansion and inversely related to the rate of participation. The RoU is projected to decline in all scenarios, the improvement being directly related to employment expansion and inversely related to the increase in the RoA.

Table UK10. Main labour market variables and main labour market indicators (2015) and in six scenarios of labour force participation and employment growth (2030)

	WAP	Labour force	Employment	Unemployment	RoA	RoE	RoU
	2015						
	41,291	31,754	30,028	1,727	76.9	72.7	5.8
	2030						
A1	43,288	34,013	32,234	1,778	78.6	74.5	5.2
A2	44,780	35,185	33,382	1,803	78.6	74.5	5.1
A3	46,310	36,387	34,559	1,828	78.6	74.6	5.0
B1	42,852	34,028	32,234	1,794	79.4	75.2	5.3
B2	44,344	35,212	33,382	1,831	79.4	75.3	5.2
B3	45,874	36,428	34,559	1,869	79.4	75.3	5.1

The scenarios in terms of flows: Labour needs by educational level

The previous analysis in terms of flows has allowed estimating the flow labour demand and flow labour supply by educational level over the 2000–2015 period. This approach provides a way to estimate scenarios of the future labour demand in terms of flow that will be expressed by the United Kingdom economic system and the future labour supply that will be generated by the people present in the United Kingdom in 2015, both by educational level. The labour needs in

alternative hypotheses of labour demand and supply will then be computed. To carry on this exercise, a series of additional assumptions are needed.

(a) Entries in WAP in the 2015–2030 period will be equal to the number of young people that were in the 0–14 age bracket in 2015.
(b) For what relates to labour force, two scenarios were built assuming that the percentage of entries into the labour force with respect to the entries into WAP (the RoAF) will be equal to: (i) the rate registered between 2000 and 2015 (83.3%) and (ii) the rate registered in the same period by men (86.5%), which implies a completely alignment of women's behaviour to men's behaviour.
(c) The labour demand in terms of flow is equal to the sum of the replacement demand and the additional demand.

To compute the labour demand in terms of flow, it is assumed that:

(a) The replacement demand will be equal to the number of the employed in the 50–64 age group in 2015 that will necessarily exit the labour market for age-related reasons; and
(b) The additional demand will be taken equal to the values used in the stock scenarios.

This process does therefore produce two estimates of labour supply and three estimates of labour demand in terms of flow that are shown, together with the estimate of the entries into WAP in (Table UK11).

Table UK11. Entries into WAP, labour force and employment in alternative scenarios (2015–2030)

Entries into WAP		Entries into labour force		Entries into employment		
				Replacement demand	Additional demand	Labour demand in terms of flow
15-year values						
11,503	A	9,584	1	8,308	2,207	10,514
	B	9,953	2		3,354	11,662
			3		4,531	12,839
Average yearly values						
767	A	639	1	554	147	701
	B	664	2		224	777
			3		302	856

Coming now to the percentage share of the three educational levels of labour supply and labour demand we have assumed, in a conservative vein, that in the next 15 years the structure of entries into labour force and employment will be the same as the one registered in the previous 15 (Graph UK7), which does also imply that the educational level of the demand will be slightly higher than that of the supply.

Graph UK7. Projected shares of educational levels for the labour supply and the labour demand in terms of flows; average values for the period 2015–2030

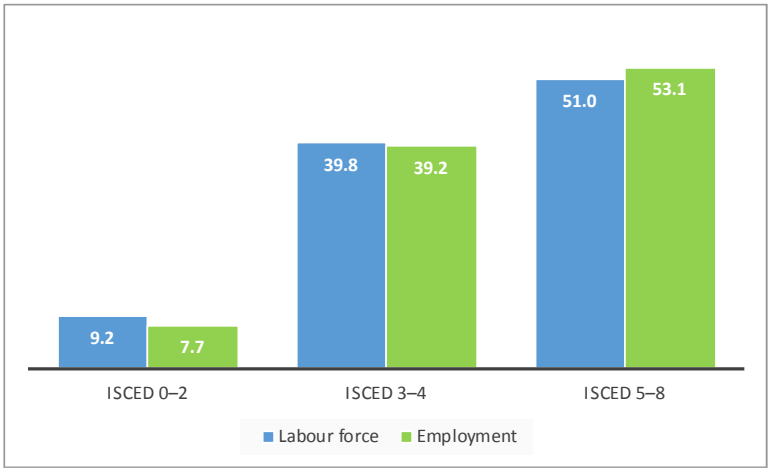


Table UK12 reports the entries in labour force and employment by educational level in the alternative hypotheses of labour force participation and economic (employment) growth.

Table UK12. Entries into labour force and employment by educational level in alternative scenarios (2015–2030); absolute values in thousands

	Labour supply in terms of flow in alternative scenarios		Labour demand in terms of flow in alternative scenarios		
	A	B	1	2	3
ISCED 0–2	881	915	810	898	989
ISCED 3–4	3,813	3,960	4,123	4,573	5,035
ISCED 5–8	4,890	5,078	5,581	6,190	6,815
Total	**9,584**	**9,953**	**10,514**	**11,662**	**12,839**
Yearly	**639**	**664**	**701**	**777**	**856**

Finally, the labour needs were computed as the difference between the labour supply and the labour demand in terms of flows for each educational level as well as the share of each educational level on total demand (Table UK13).

Table UK13. Labour needs by educational level in three scenarios of employment growth; total values and percentage composition; 2015–2030

	Labour needs in alternative scenarios					
	A1	A2	A3	B1	B2	B3
	Absolute values					
ISCED 0–2	71	-17	-108	105	17	-74
ISCED 3–4	-310	-613	-912	-163	-613	-1,075
ISCED 5–8	-692	-1,112	-1,234	-503	-1,112	-1,737
Total	**-1,002**	**-1,743**	**-2,254**	**-667**	**-1,726**	**-2,886**
Yearly	**-67**	**-116**	**-150**	**-44**	**-115**	**-192**

	Percentage composition by educational level					
	LN1	LN2	LN3	LN1	LN2	LN3
ISCED 0–2		1.0	4.8			2.6
ISCED 3–4	31.0	35.2	40.5	24.5	35.5	37.2
ISCED 5–8	69.0	63.8	54.8	75.5	64.5	60.2
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

As already indicated, in all scenarios, the local labour supply is insufficient to face the demand, the difference being positively related to labour demand and inversely to labour supply.

Coming to the needs by educational level the United Kingdom needs almost exclusively people with middle high education. More specifically, the yearly need of people with high education is estimated between a minimum of 34,000 in Scenario B1 and a maximum of 116,000 in Scenario B3, while that of people with intermediate education ranges between 11,000 and 72,000 in the same scenarios.

MANAGING MIGRATION FLOWS: A PROPOSAL

This proposal is a phased approach/programme with the aim of building cooperation between countries across the Mediterranean, with Egypt as a pilot model, to meet the potential demographic and economic challenges; a process that aims to better plan for and maximize the potential of demand-driven migration.

The precondition is the high-level political understanding needed to counteract years of xenophobic anti-migrant rhetoric that has been fueled by the 2008 financial crisis and the fear and uncertainty that has resulted from it. With this in mind, there is a need for constructive dialogue regarding the need for labour migration between the aforementioned European countries and Egypt as a sending country in order to create a common vision of how this need can be addressed in an organized and mutually beneficial way.

In the absence of such an agreement, labour market imbalances (with gaps in industrialized countries and surpluses in others) will continue to draw irregular migrants seeking better livelihood opportunities and risking their lives, often in the hands of smugglers, on potentially fatal journeys.

The overall objective of the proposed programme is to

Assist Egypt and a selected number of European countries to better plan for and maximize the potential of demand-driven migration.

To this end, the programme foresees three outcomes that correspond to three subsequent phases of implementation, to achieve higher degrees of mutually beneficial long-term results:

(a) Selected European countries and Egypt agree on realistic forecasting methods to ascertain their respective labour migration needs;
(b) Selected European countries and Egypt coordinate evidence-based labour migration policy and mechanisms through a Labour Migration Observatory; and
(c) Labour migrants are actively matched to job opportunities in Europe through a Placement Centre with access to labour market information in Egypt and receiving countries.

The first phase also will involve developing and testing methodologies for projecting labour market deficits and surpluses by key officials who will be trained on the methodology. Furthermore, few European partners will be identified, as those with the greatest potential need for labour migrants, and invited along with Egyptian officials to validate the findings of the projections and discuss a framework for cooperation on labour mobility.

The second phase in envisaged to facilitate follow-up bilateral meetings between Egypt and receiving countries participating in the conference in order to reach an agreement on pilot labour migration and labour mobility schemes. At the same time, if a clear need is identified during the conference, the programme will establish the Labour Market Observatory that will serve as a hub for information, expertise and training. Staffed by trained experts on labour market assessment in general and the specific methodology that was developed, the Observatory will help continue collecting and exchanging labour market information in a systematic manner, in collaboration with the national and international institutions already operating in this field. In turn, findings of regular consultations shall guide policymakers in Egypt, so that they can review and adjust vocational training, educational and other labour-market related policies towards the needs of European labour markets in order to facilitate the mobility of workers.

The third and final phase will see all the above-mentioned groundwork reach fruition through the active insertion of labourers into the European labour force. The programme will facilitate the implementation of agreements reached, especially on data sharing, and in coordination with all the participant countries.

Annex 1

THE DEMOGRAPHIC TRANSITION

According to a largely prevailing interpretation,[15] the demographic transition is a process that determines the passage from a "traditional" demographic equilibrium, characterized by high rates of fertility and mortality, to a "modern" demographic equilibrium, characterized by low rates of fertility and mortality.[16]

It was generally assumed that the decline in the total fertility rate (TFR) would stop at around 2.1 children per woman, which assures a stable population. As a matter of fact, the TFR has already dropped well below two in numerous developed and developing countries, producing a negative natural balance.

This and other observations suggest that there are no sufficient indications to infer that the final outcome of the present demographic transformation will be a situation of equilibrium brought about by similar values of birth and mortality rates. It can also be argued that the present transformation is not leading to an orderly and efficient demographic regime, but is a transition between two different types of disorder and inefficiency: the first due to the incapacity of men

[15] For a detailed analysis of the history of the transition theory, see D. Kirk, "Demographic transition theory", *Population Studies*, 50(3):361–387 (1996); see also J.C. Chesnais, *La transition démographique. Étapes, formes, implications économiques* (PUF, Paris, 1986).

[16] The goal of this "theory" (or well-documented generalization) is to explain the changes in birth and death rates observed during the passage from a pre-industrial to an industrial economic system.

to control "natural" phenomena, the second to his incapacity to manage, in a socially oriented way, his capacity to control them.[17]

Along its path, the demographic transition has a huge impact on the population level and structure. Three main phases can be distinguished.

(a) The initial phase is characterized by a decline in mortality mainly due to improvements in the infant mortality rate. The total population increases at an increasing rate; the percentage of young people increases, while the weight of the working age population (WAP) declines; in this phase, the elderly represent a small minority.
(b) In the second phase, fertility begins to decline and the number of births progressively approaches the number of deaths: total population continues to increase, but at a decreasing rate; the percentage of young people starts to decline, while that of WAP increases, reaching its maximum; the percentage of elderly continues to be very modest.
(c) In the third phase, the number of births becomes smaller than that of deaths and the total population starts to decline; the weight of WAP declines, while that of the elderly increases.

In conclusion, the demographic transition is a process that brings a country from population explosion to population decline, from a phase of declining average age to a phase of ageing. This last phenomenon is made more dramatic by the simultaneous decline of the people in working age.

Empirical observation shows that all the countries affected by the demographic transition follow the same general path, albeit with different intensity and speed depending on their political and cultural setting.

The demographic transition has the same impact on WAP as on total population. In the first phase, generational entries into WAP expand, while generational exits remain constant and WAP increases at increasing rates. In the second phase, generational entries decline, while generational exits increase, so WAP continues to grow but at a declining rate. The moment arrives when generational exits exceed generational entries and WAP starts to decline. In conclusion, the demographic transition brings a country from a situation in which WAP, the source of labour supply, increases at an increasing rate to a situation in which it declines at an increasing rate.

[17] M. Bruni, *Promoting a Common Understanding of Migration Trends* (International Organization for Migration, Egypt, 2017). Available from https://publications.iom.int/system/files/pdf/migration_trends_web.pdf

The starting moment of the demographic transition is linked to the level of economic development. As a matter of fact, the demographic transition started more than 200 years ago, together with the industrial revolution, in the countries that now belong to the groups of the most developed countries, while in the least developed countries, the demographic transition process is starting now.

As a consequence, the demographic transition is producing the co-presence of countries with a negative natural balance and countries whose total population is increasing at an increasing rate, of countries that are ageing at a very fast pace and countries that are becoming younger and younger, and of countries whose WAP (and therefore whose potential labour supply) is declining and countries whose WAP (and therefore whose potential labour supply) is exploding.

It could therefore be argued that only massive migration flows can bring the countries affected by the demographic transition to a situation of demographic equilibrium.

ANNEX 2

A STOCK-FLOW MODEL OF THE LABOUR MARKET[18] AND IMMIGRATION FLOWS[19]

In order to explain migration, a flow variable, a model is needed that will: (a) include not only stock variables, but also flow variables; (b) portray real individuals acting in real time; and (c) allows for the possibility of structural disequilibria between labour demand and supply, that is, disequilibria that cannot be eliminated by changes in the real wage, but require long-term adjustments in WAP and/or in the production level.

Figure A1 provides a simplified representation of human life and population structure from a labour market perspective. It can therefore be used to represent a stock-flow model of the labour market.

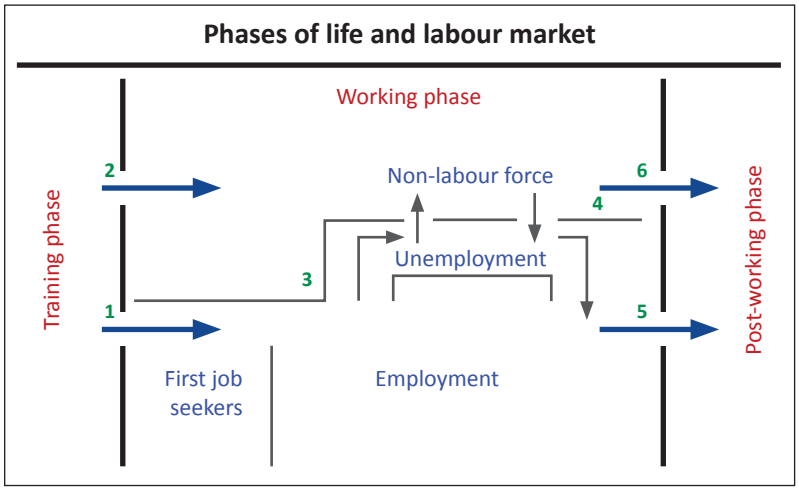
[18] M. Bruni, "A stock-flow model to analyse and forecast labour market variables. *Labour*, 2(1):55–116 (1988); M. Bruni, "Per una economia delle fasi della vita", in *Popolazione, tendenze demografiche e mercato del lavoro* (SIS, IRP and GDP, eds.) (IRP and CNR, Rome, 1993).

[19] M. Bruni, "Migrations and demographic projections: A new methodology to jointly build labor market and demographic scenarios", *Genus*, 68(3):1–26 (2012).

From an economic perspective, human life can be divided into three phases that define three corresponding subpopulations:

(a) Training phase and the population in the training phase;
(b) Working phase and the WAP; and
(c) Post-working phase and the post-working phase population.

Figure A1. A stock-flow representation of the labour market



WAP includes other subpopulations relevant for labour market analysis: (a) labour force as differentiated into employment, unemployment and first-job seekers; and (b) non-labour force. These populations are the main stock variables of the model.

If an interval of time is considered, the arrows in the figure are given life. They represent the flow variables that measure people moving from one condition to another (from one population to another).

In any given time interval, the flow variables determine the quantitative and qualitative changes registered by the related stock variables:

(a) Births and deaths determine the natural dynamic of total population;
(b) The number of people becoming 15, the number of people becoming 65, and the deaths registered in working age determine the natural dynamic of WAP; and
(c) Entries and exit flows determine the level, structure and trends of employment and the labour force.

The following can now be defined:

(a) Generational entries (first-time entries) into the labour as the "Labour supply in terms of flows" (LSF);
(b) Generational entries (first-time entries) into employment as the "Labour demand in terms of flows" (LDF).

Generational entries into employment are determined by the sum of two components: (a) the increase in the employment level (additional demand, *AD*); and (b) the definitive exits from employment due to retirement and deaths taking place in the 15–64 age bracket (replacement demand, *RD*).

The level of AD is determined by the rate of growth of production (Y), by the real wage (W) and by technological innovation (T):

$$[1]\ AD = AD\ (Y, W, T)$$

AD can be positive or negative, depending on the phase of the economic cycle. RD represents the major component of the labour demand in terms of flows. As already seen, RD measures entries into employment due to the need to replace people exiting definitively from employment as a result of retirement or death. It is influenced by the retirement laws and their modifications, as well as by the economic cycle that influences workers' expectations. However, its main determinant is the age structure of the employed (ASE). Therefore, its value tends to change slowly through time. A simple specification of the supply function is the following:

$$[2]\ RD = RD\ (ASE, t; INR)$$

where *t* represents time, and *INR* is a parameter that tries to capture the effect of institutional norms and rules.

Moving now to the supply side, entries into the labour force are the sum of two components: (a) the primary labour force constituted by all breadwinners, typically men but also a growing number of women that see work as the normal outcome of their training phase and consider labour market participation both as a right and as a duty; and (b) the secondary labour force, represented mainly by students and homemakers, whose participation fluctuates with the economic cycle. It can therefore be assumed that the entries of primary workers are determined by entries in the WAP (and therefore by the number of births that took place at a time (t – n) where *n* is the average duration of the training phase).

Entries of secondary workers will be determined by the perceived probability of finding a job, which can be measured by the LDF – given the norms and values that define the social role of women (INRW).

$$[3]\ LSF = LSF\ (WAP, LDF; INRW)$$

The labour market is in a state of flow equilibrium (which implies that unemployment remains constant) if the labour supply in terms of flow (LSF) is equal to the labour demand in terms of flow (LDF), that is, if generational entries into the labour force are equal to generational entries into employment:

$$[4]\ LSF = LDF$$

$$LSF\ (WAP, LDF; INRW) = AD\ (Y, W, T) + RD\ (ASE, t; INR)$$

In other words, a labour market is in a state of flow equilibrium if the number of additional jobs created by the economic system, in a given time interval, is equal to the difference between generational entries into the labour force and generational exits from employment:

$$[5]\ AD = LSF - RD$$

Such an equilibrium solution is not normally achieved, with disequilibrium being the norm. When WAP is not affected by pronounced demographic trends, the result of disequilibrium will be temporary, cyclical oscillation of unemployment. Empirical evidence shows, however, that there are situations in which disequilibrium is a structural long-term phenomenon.

As a consequence of the demographic transition in many countries (mainly the most developed ones), entries into the labour force are largely lower than generational exits from employment, while in others (the least developed), entries into the labour force largely exceed generational exits from employment. Demographic forecasts and economic considerations also suggest that these opposite situations not only are already present in many countries, but will last for a long time and the number of countries affected by them, in one way or the other, will progressively increase.[20]

The first is a situation characterized by a **structural shortage of labour**, the second by a **structural excess of labour**. In the first, changes in the real wage and active labour policies cannot equate labour demand and supply; in the second,

[20] Bruni, 2017.

local economies cannot produce the number of additional jobs necessary to face the increase in labour supply. The first group of countries presents a potential need for foreign labour, and they are therefore potential arrival countries, while the second group of countries is affected by a migratory potential, and therefore constituted by potential departure countries.

As seen in the previous annex, different countries have started the demographic transition in different moments of times over the last 200 years, proceeding at different speed along its path. As a consequence, the demographic transition has produced, is producing and will produce the co-presence of countries characterized by a *structural shortage of labour* and countries that present a *structural excess of labour*.

This situation represents the premise for a migration model that aims to explain and therefore forecast net immigration in the countries characterized by a structural lack of labour.

The proposed model assumes that a structural shortage of labour will necessarily attract the migrants necessary to close the gap between labour demand and supply, given the presence of an unlimited supply of labour in the countries characterized by a structural excess of labour. The model does therefore posit that migration are *pulled* by labour demand, but need the presence of a structural excess of labour in other countries. The model does therefore forecast that countries with a structural shortage of labour supply will have a positive migration balance, and that the size of the balance will be in line with their employment needs.

The main goal of the model is to estimate alternative scenarios of labour needs. It can be estimated both through a stock approach or a flow approach. The second approach allows estimating the employment needs by educational level.

The stock approach. In this approach, total employment needs (TEN) are equal to the difference between the change in labour supply (ΔLS) and the change in labour demand (ΔE) in a given time interval, labour demand and labour supply being defined in terms of stock:

$$[6]\ TEN = \Delta LS - \Delta E$$

The change in labour supply will be determined by the change in WAP, and by the change in the rate of participation (RoP):

$$[7]\ \Delta LS = [(RoP_t * \Delta WAP) + (\Delta RoP * WAP_{t+1})]$$

The change in the employment level will depend on economic growth and the employment income elasticity (ε):

$$[8]\ \Delta E = {}_t\,(\Delta Y/Y)_{t+1} * \varepsilon$$

Therefore:

$$[9]\ TEN = [(RoP_t * \Delta WAP) + (\Delta RoP * WAP_{t+1})] - {}_t\,(\Delta Y/Y)_{t+1} * \varepsilon$$

A negative value indicates that the local labour supply is not sufficient to satisfy the demand.

The flow approach. In this approach, total employment needs (TENF) are defined as the difference between generational entries into the labour force and generational entries into employment, that is between the LSF and the LDF:

$$TENF = LSF - LDF$$
$$= LSF - AD - RD$$

Given the entries into WAP, the LSF is estimated making different assumptions on the rate of participation in terms of flow. The LDF is the sum of two components: RD and AD. AD is computed using alternative rates of growth of employment, while RD is taken equal to the number of employed in those age groups that will necessarily exit the labour market for age reasons.

The flow approach allows estimating alternative scenarios of employment needs by educational level by adopting a series of assumptions on the evolution of the structure of the demand and supply of labour in terms of flow by educational level.

In both approaches, the scenarios of total labour needs are obtained mixing the scenarios of labour demand and labour supply.

The number of migrants will normally exceed the TEN, because a relevant and an increasing number of them will be accompanied or followed by family members. Therefore, the migration balance (MB) will be equal to:

$$[10] \quad MB = b*TEN$$

At the beginning of the migration phase, *b* will probably just be equal to 1, but as the migration becomes more structural, the value of *b* will progressively increase up to values between 1.4 and 1.5.

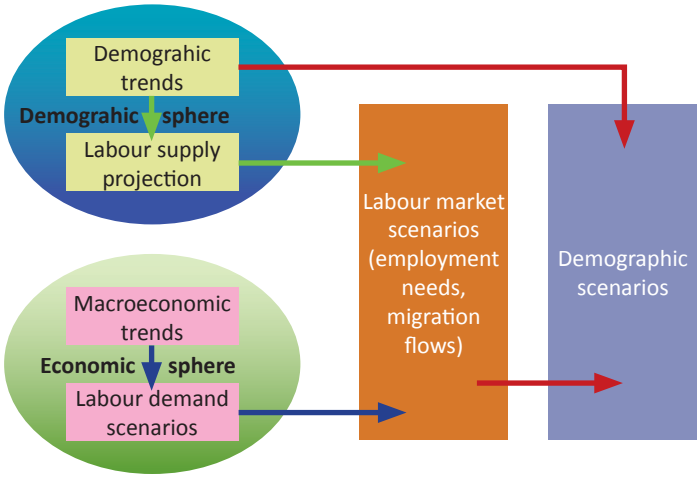
ANNEX 3

THE PROCEDURE TO JOINTLY BUILD LABOUR MARKET AND DEMOGRAPHIC SCENARIOS

The scenario procedure includes two phases (Figure A2). The first produces the scenarios of employment needs and the corresponding estimates of the migration balance, the second fully-fledged demographic scenarios.

In the first phase, the migration model presented is estimated via two parallel paths. In the first (the demographic path), the projection of WAP represents the prerequisite to estimate alternative scenarios of labour supply. In the second (the economic path), alternative scenarios of labour demand are estimated. The two paths merge to produce alternative scenarios of employment needs and then of migration balances, that will, in their turn, determine different levels of WAP.

Figure A2. The procedure to jointly build labour market and demographic scenario



The second phase allows obtaining scenarios of the total population following the standard procedure, i.e. by estimating the number of births (via the number of women in fertile age and hypotheses on fertility) and the number of elderly (based on hypotheses on the specific rates of mortality).

This procedure does therefore produce demographic scenarios based on demographic trends, alternative rates of labour market participation, and alternative rates of economic growth, as well as the usual hypotheses on fertility and mortality.

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