

# EVOLUTION OF THE EDUCATIONAL LEVEL OF THE LABOR SUPPLY IN MEXICO

## *A Comparison with the European Union*

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### Abstract:

Presented are the initial results of the research project, "Educational Expansion and the Labor Market in Mexico, a Comparison with the European Union." An analysis is made of the growth of education in Mexico by determining the educational level of its economically active generations, in comparison with the European Union. In Mexico, such growth is slower, but due to the nation's demographics, the supply of young people with a high level of education has increased faster than in Europe. In addition, during recent decades, the protagonists in this process have been women. Such a phenomenon implies a changed model in the production of skills: a simultaneous challenge and opportunity for the Mexican economy.

Key words: educational expansion, skills, labor supply, comparison, Mexico, European Union.

## Introduction

This article includes the initial results from the ongoing research project, "Educational Expansion and the Labor Market in Mexico, a Comparison with the European Union—EDEX—Mexico"<sup>1</sup> (EDEX is the acronym of *Educational Expansion and Labour Market*). This study was preceded by EDEX-Europe, financed by the European Union (EU). Since the synthesis of its results has already been published (Béduwé and Planas, 2003), it served as an obligatory point of reference throughout this article. The objective of both studies is to explain how growth in the educational level (formal instruction) of our countries has affected the behavior of the labor markets.

EDEX-Mexico, through transatlantic comparison, attempts to understand the diversities and similarities in the effects that growth in the educational level has on the labor market, in two distant and distinct realities: Mexico and the five major countries of the European Union—Germany (G), France (Fr), Italy (It), Spain (S) and the United Kingdom (UK). The first phase<sup>2</sup> of EDEX-Mexico, the results of which are presented in this article, has concluded. The main objective of this stage has been to analyze, measure and compare the educational expansion of Mexico with regard to that of the European Union in the second half of the 20<sup>th</sup> century. Educational expansion has implied a change in the skill production model that has supplied the necessary labor for economic development during recent decades in Europe.

To analyze this evolution comparatively, the article is divided into five parts. The first part delineates the topic and presents the theoretical elements in the framework of analysis. The second part describes the evolution of the educational level of generations of Mexicans born between 1940 and 1980.<sup>3</sup> The third part analyzes how the evolution of the population's educational level influences the level of the economically active population. The fourth part compares Mexico's data with those of the European Union (EU), and the last part is a section of conclusions.

## Delineation of Topic and Theoretical Elements

A central element for delineating the topic under discussion is to define educational expansion: the fact that each generation (individuals born the same year) has more schooling than the preceding generation. This fact has been verified in Europe (not exclusively) during the past half century (Vincens, 2002).

Although the fact may seem banal, as a social phenomena it has had great impact on our economies. It has permitted, as shown below, a change in the model of producing skills+ understood to be the professional abilities and knowledge necessary for the economy (Vincens, 2002; Béduwé and Planas, 2003).

*What are the characteristics of the new model of skill production that is associated with educational expansion?*

Educational expansion is the result of a strategy, convergent and somewhat consensual, among the government, the educational system, families and companies. Such a strategy is aimed, as indicated by Béduwé and Germe (2004), at developing initial training in order to ensure, in quantitative and qualitative terms, the production of skills necessary for the economy. The strategy corresponds to a certain model of development, in which the educational system guarantees young people's professional training. On doing so, the system produces the points of reference (certificates) necessary for the functioning of the labor market and for constructing professional trajectories. It gives young people, through higher general training, the ability to continue their training, to adapt and to evolve. This driving role of initial training has been reinforced over time, and company expectations with regard to young people's training have increased. Companies participate in the model by accepting and favoring professional training at school; they construct qualifications based on such an education and its certificates. Thus the system of initial training becomes a monopoly in the production of certificates, which have a high value in the labor market.

Jean Vincens (2002) summarizes the change of the model caused by educational expansion:

To understand these changes, one must distinguish between the development of skills and schooling. Explicit education, produced in an organized manner in courses and crowned by a title, has actually played four roles in the time period from 1950 to 2000: it has contributed to providing individuals with increased useful skills for economic development; it has replaced a part of the unseen training given on the job at companies and agricultural enterprises, often family-managed; it has contributed to the process of the explicit certification of skills that is increasingly more useful for the functioning of the labor market in relation to the new forms of societal organization; and lastly, it has played a role as filter in the selection processes for filling positions, making it a mechanism for individuals' social positioning.

The new model definitely cannot reduce the production of skills to initial education. The model does, however, establish its basis in initial education. And initial education begins to play a role formerly filled by work itself as a fundamental source of skills for the economy.

*What needs for skills are being filled by this growth in initial education?*

Recent decades have been marked, in Mexico (ORT, 2000; Calero, 2004) as well as in the European Union (Planas *et al.*, 2001:337-347), by the deterioration of the relative position of workers without qualifications. This change translates into a decrease in

their relative wages and/or an elevation in their rates of unemployment or reduced job security.

This phenomenon is not foreign to the transformations that have occurred in our production processes, which have reduced the demand for workers without qualifications. The factors of this change are multiple: technological, organizational, the globalization of markets, a move toward a tertiary economy, etc..

The fact that such changes affect the requirements for qualifications and that the level of qualification is related to initial training is currently recognized in social research (Descy and Tessaring, 2001) as well as in terms of political actors.

An illustrative political position is the Mexican government's Programa Nacional de Educación 2001-2006, which proposes that by 2025, one-half of the population between ages 19 and 23 should be enrolled in the system of higher education. The program's justification is that:

Higher education is a strategic means to increase the nation's human and social capital and Mexicans' individual and collective intelligence; [...] and to contribute to the increased competitiveness and employment required by the society of knowledge. It is also a factor to promote the growth of the national product, social cohesion and justice [...] (from ANUIES, 2003).

Also illustrative is the proposal of the European Commission. Its *Work Programme on the Follow-up of the Objectives of the Education and Training Systems in Europe* has the key issue of: "Encouraging young people to remain in education after the end of compulsory education; and motivating and enabling adults to participate in learning through later life."

The theoretical discourse on the economy and the society of growth goes even farther, by formulating that knowledge has become a directly productive force: "For the first time in history, the human mind has become a direct productive asset, rather than just a decisive production factor; its significance and productive value is also changed by its cultivation, through training in the broadest sense" (Castells, 1997:58).

At present, many authors sustain that we are in a society of growth, in an economy of knowledge, and are generating a new regime of economic growth: an acceleration of the pace and intensity of innovation; more collective and disseminated construction of the modes of production of knowledge (companies that learn, networks of knowledge); and massive growth of the *externalities* of the diffusion of knowledge (through technologies of information and communication).

The first element of reference in our reflection is, therefore, "society based on knowledge", and more particularly, the economy of knowledge as a conceptualization of the transformation of the types of work organization and growth processes. Knowledge is understood, in the broad sense, to be a set of knowledge incorporated into people and products. Ever since the pioneering studies of Arrow (1962), knowledge has been said to have three characteristics: a) it generates positive externalities, b) it is not destroyed by use, but by obsolescence, and c) it is accumulative; in other words, the more it is spread, the more it is created.

The classical distinction between codified and tacit knowledge (Polanyi, 1966) is also central to our reflection. Some knowledge can be codified in the form of messages (information) that can be spread widely, and in this sense has the essential characteristics of a public good. But another part of knowledge continues to be tacit, and forms part of personal skills as well as companies' collective skills. Such

knowledge is transferable only through an implicit learning process (see for example, Foray, 2000).

Like the theories of endogenous growth, the economy of knowledge situates learning processes at the center of the mechanisms of skills accumulation. At the same time, this relationship is direct—through the creation of devices to develop training (initial or continual, formal and/or informal)—and indirect, through the effect of these devices on innovation and the propagation of technical progress.

The general context in which this current of thought invites us to situate our reflection is the (relative) dematerialization of production, which translates into a faster increase of intangible investment (Abramovitz and David, 1996), and a shortened life cycle of “efficient” knowledge (able to create a “monopolistic” advantage with respect to competitors). Debate exists on whether we are involved in a new system of growth (Boyer and Saillard, 2002) that has broken away from the past, or in the presence of simple acceleration of traditional mechanisms (Howitt, 1996). But all agree in predicting the maintenance and/or accentuation of the described occurrences over the medium term. And because of the synergy that these occurrences will establish with the diffusion of information and communication technologies, there is also expected growth in the rate of creation, the speed of diffusion, and the speed of obsolescence of knowledge and associated innovations.

In spite of the considerable problems suggested by the definition of the concept of knowledge (and associated skills) (Machlup, 1962; Paillard, 2000), it seems clear that teaching—and especially at higher levels—lays a central role in the production and diffusion of knowledge. Higher levels, in the duality of teaching and research, are a place where knowledge is created—directly, through its own production, and indirectly through the training offered to other actors of innovation and research. Higher education is a fundamental space for the accumulation of knowledge, as well as for spreading knowledge and transforming it into skills (e.g., in productive know-how). Even more, it is the natural place for acquiring major cognitive skills, which are the guarantee of a dynamic adjustment of operative skills in a society based on knowledge. In countries where secondary learning is massive, higher levels are a privileged vector for education to become a concrete reality over the individual’s lifetime.

The development of initial training must favor the access and effectiveness of recurring explicit training; i.e., of “learning over an entire lifetime”. In addition, as underlined by Rosenberg (1982), it will permit a process of improving technology through interactions between producers and users. Lastly, the synergies between new technologies and the redefinition of skills, characteristic of mechanisms of learning by doing (seen as effects of scale on experience), are positively related to traditional learning, and especially at higher levels (Cohen and Lervinthal, 1989).

The economy of knowledge is direct invitation to become interested in teaching, in its direct (transmitting knowledge) as well as indirect dimension (participating in the acceleration and accumulation of knowledge).

In this sense, we cannot forget the basic nature—and to a large degree irreversible—of the level of initial training for accessing lifetime training (Planas et Plassard, 2000). Through this process, the skills of the active population are updated and renewed.

#### *Does Educational Expansion Respond to the Demands of the Labor Market?*

Our project considers the labor supply as an active or driving element of the demand for labor and economic growth. It moves away from models of analysis that consider the labor supply a subordinate and dependent element of the existing demand for employment, according to the logic of the manpower approach.

Earlier research (Murphy and Welch, 1989; Bartel and Sicherman, 1995) shows that success in the technological innovation of companies is closely related to the capacity for the complex use of human resources. Bruno (1998) has described company interactions between the capacity of innovation and the willingness and capacity to use increasingly better trained labor. In the same sense, Caroli and Van Reenen (1998) have affirmed that the probability of producing organizational change in a company is directly related to the proportion of its workers who have degrees.

Several years ago, the new productive models evaluated human resources management as an instrument to construct social architecture to support companies' strategies of innovation and change (Watson and Wyatt, 1995).

The EDEX-UE research (Béduwé and Planas, 2003) shows a generalized elevation of educational levels at hiring, in the five nations and in the set of studied sectors. Most employees consume more education, and are supporters of the growing production of the educational system.

In this manner, employers have been benefited by the raised level of the general education of wage earners and of young people in particular, because they have been able to recruit employees in the outside market who are more flexible and more adaptable. Such employees have allowed companies to decrease their costs of productive insertion. In this manner, companies have been able to concentrate their training efforts on the continued adaptation of employees; they have reduced training costs by improving the educational level of employees who must be trained (Stankievich, 1999).

The results obtained in EDEX-Europe situate us in a theoretical perspective in which the changes produced *in the labor supply* have preceded and in good part conditioned the changes that have occurred in the *demand for labor*. Here one must remember that initial certified training is one of the greatest changes in the labor supply. We are following the line of theorists who, like Kiley (1999), sustain that increases in the supply of qualifications bring an increased demand for qualified labor, since they generate additional technological progress that is adequate for the qualifications of the labor supply.

The elevation of the level of educational certification is also perceived as a *sign of greater social and cognitive skills*. Such skills have a determining importance because they constitute on one hand the substratum for dispensing technical training. On the other hand, social aptitudes constitute an inevitable component of success in the relation between the company and its client. They are also the most difficult skills to transmit through ongoing training.

According to the results of EDEX- Europe (Béduwé and Planas, 2003), companies have favored young people with a high level of schooling, for four reasons:

- 1) They have more training in the specific skills that companies need.
- 2) They have the basic transversal skills for obtaining work and maintaining the ability to find employment, especially in the expanding services sector.
- 3) They imply lower costs for new-hire training and adaptation.
- 4) They constitute a "reserve of skills" that can be mobilized if necessary.

### **The Growth of Mexicans' Educational Level<sup>4</sup>**

This section presents the evolution of the educational level of the various generations of Mexicans now in the labor market. The data presented in this article were prepared within the framework of the EDEX-México project (Mercado y Planas, 2004).

The methodological characteristics of our research are: *a)* to base the analysis and comparison of the growth of schooling on generations, and *b)* to establish the level of certificates as a measure of education.

Using the idea of generations allows us to analyze the labor supply of a nation at a certain moment in time, by superimposing the generational strata present in the economically active population.

At present, most of the economically active population consists of individuals born between the 1940s and the 1980s. The educational level is very different between generations and is the reflection of the history of our educational systems during the second half of the past century. Each generation has had different opportunities to access the educational system and has acquired its professional skills, based on different behavioral models.

*How can the population's educational growth and its impact on the labor supply be measured in a comparable way?*

This growth can be measured in multiple ways: the amount of spending on education, rates of graduation in different school years, quality of knowledge acquired by graduates or the number and level of certificates awarded by educational institutions and institutions of professional training. We will consider the latter criterion to measure growth, as we did in EDEX-Europe. The matter at hand is a quantitative measurement that does not judge the level of knowledge and skills associated with certificates. Although it may seem difficult to sustain that some factors can grow without the others, this topic is complex, as shown by recent debates regarding the case of Mexico (AA vv, 2005). We do not address this case in a direct manner in our research.

To permit comparisons among countries and generations in the same country, for EDEX Europe we prepared a single scale of educational levels for each nation, as shown in Annex 1.

To analyze the growth of schooling in Mexico, we defined five educational levels (level 1 is subdivided into two), according to the existing definitions for measuring expansion in the EU (Béduwé and Planas, 2003). These levels are:

- 1a Some elementary: includes all levels, from no schooling to the penultimate grade of elementary school.
- 1b Some secondary: considers individuals who have passed the last year of elementary school or part of secondary school, but without completing secondary school.
- 2 Some secondary and high school: includes individuals who have finished secondary and those who have started high school without completing it.
- 3 Vocational: studies of a professional/technical type that do not require a high school education.
- 4 Finished high school: considers individuals who have completed high school and those who have started higher education (technical or university) without finishing a school year.
- 5 Higher education, university or technical: includes all individuals who have finished (or have begun) a school year that requires a high school diploma for acceptance.

#### *Educational Growth by Generation*

By applying the above scale to the different generations that coexist in the labor market, we obtain the results reflected in the following charts and graphs. The data

show, in numerical form, the evolution of the structure of diplomas of Mexican generations born between 1940 and the late 1970s.<sup>5</sup>

The data presented below confirm that our introductory statements about the European Union hold true for Mexico as well: during the second half of the 20<sup>th</sup> century, each generation has attained a higher level of schooling and certification than preceding generations.

In more specific terms, we observe a process of generalization of elementary studies, no longer compulsory “on paper only”. Most of the younger generations surpass this level, and are thus substantially differentiated from the generations of their parents and grandparents. We also observe growth in each generation in secondary studies, high school, and higher education.

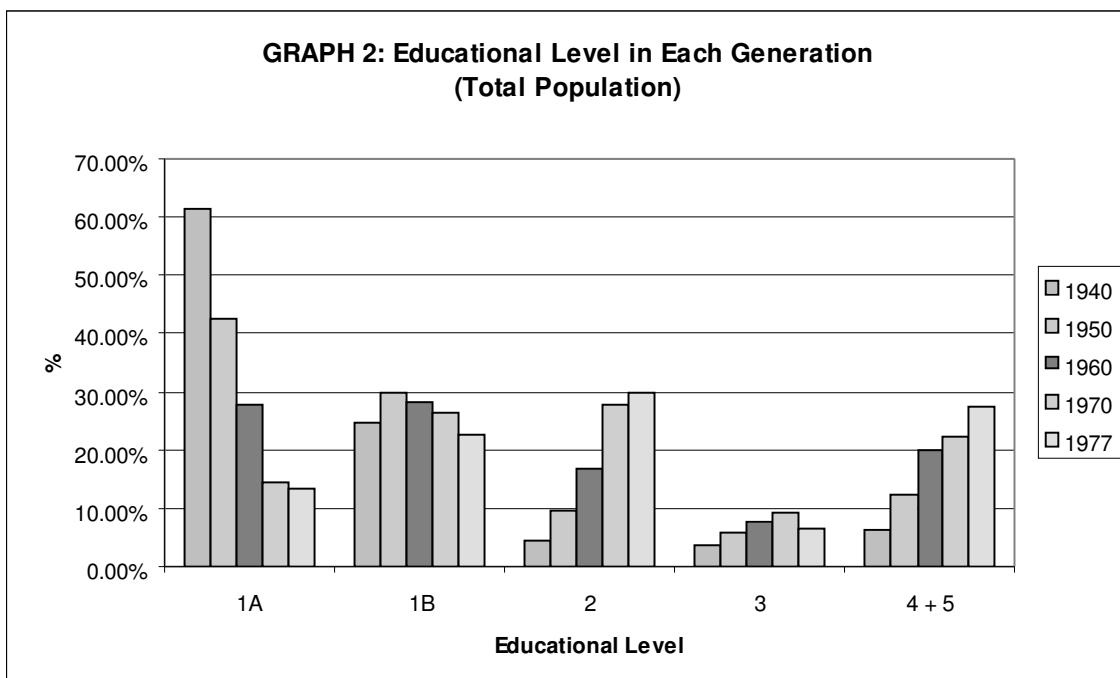
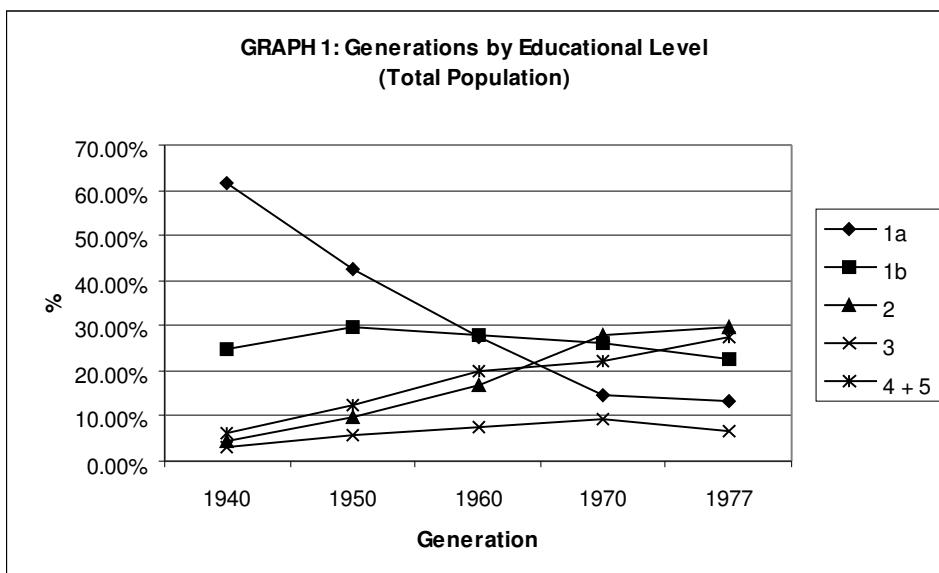
More recent generations are divided into thirds, with regard to their level of schools. One-third has not attained the now compulsory secondary level (levels 1a and 1b); this “lower level”, however, represented 85% of the generation born in the 1940s. Another one-third, now close to age twenty-five, has completed secondary studies, either general or vocational (in the minority and decreasing in size). The final one-third has finished high school and a good number has continued on to higher education.

Unique data on schooling in Mexico involves the reduced role of vocational studies, a decreasing type of post-obligatory education with little weight and an extraordinary female presence, as seen below. The growth of post-obligatory education in Mexico has been substantial in its academic variants that are oriented to higher learning.

CHART 1

*Percentages of Educational Level of Total Population by Generation*

Level	Generation				
	1940	1950	1960	1970	1977
1A	61.44	42.39	27.65	14.49	13.32
1B	24.82	29.74	28.00	26.36	22.66
2	04.34	09.73	16.90	27.73	29.86
3	03.28	05.66	07.52	09.18	06.61
4 + 5	06.12	12.48	19.92	22.24	27.55
Total	100.00	100.00	100.00	100.00	100.00



### *Differentiated Evolution by Gender*

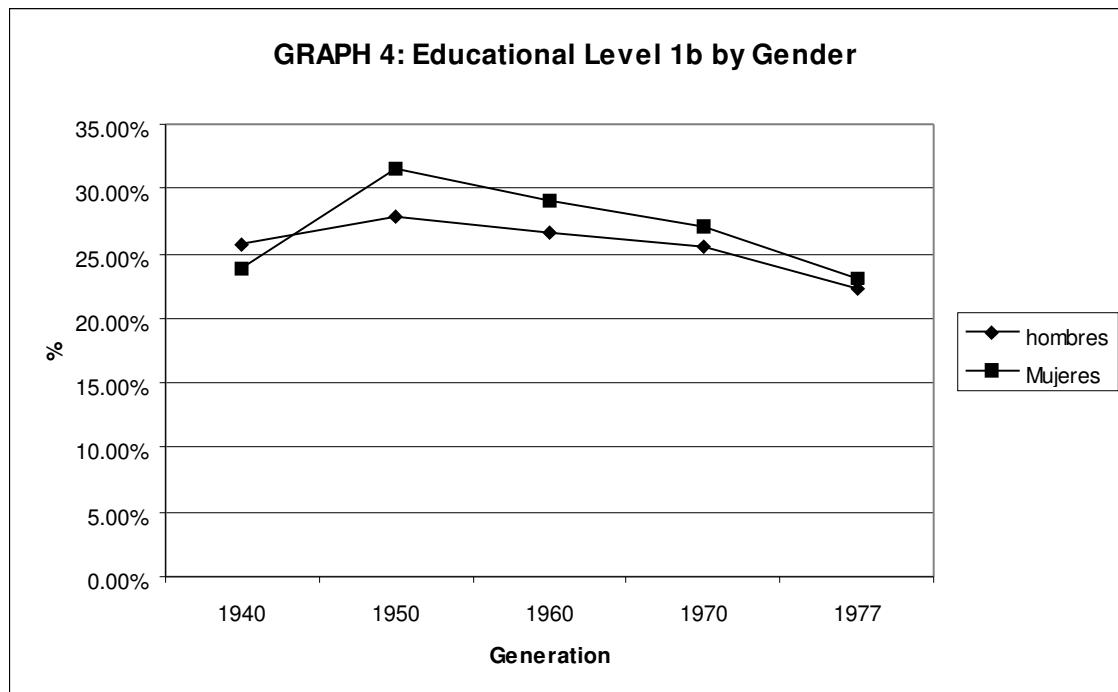
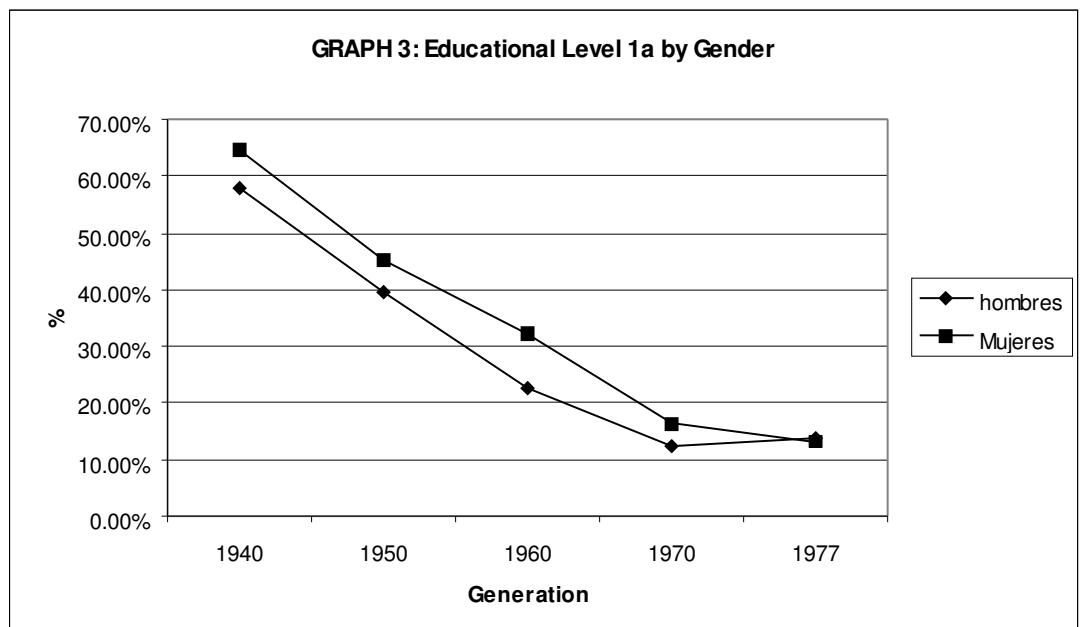
The phenomenon of the growth of the educational level, generation after generation, is shared by both sexes, but with differing starting points and rhythms. The data contained in the following tables and graphs show that the females of older ages have a very different level of schooling than their male peers, although both are at low levels:

CHART 2

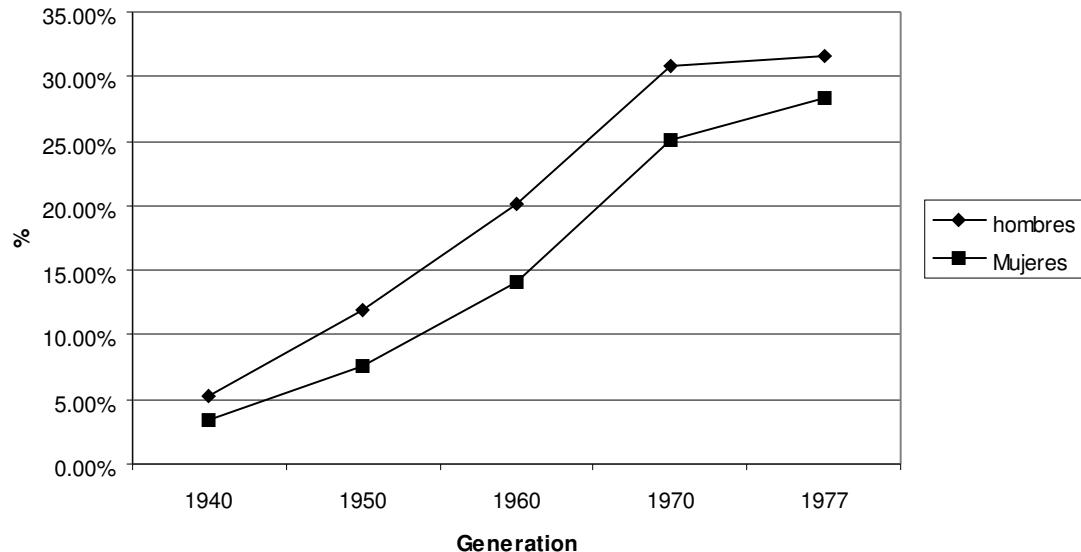
*Percentage of Total Population by Generation*

Level	Generation				
	1940	1950	1960	1970	1977
<b>Males</b>					
1A	58.14	39.42	22.64	12.48	13.65
1B	25.78	27.91	26.69	25.53	22.24
2	05.30	11.85	20.09	30.83	31.60

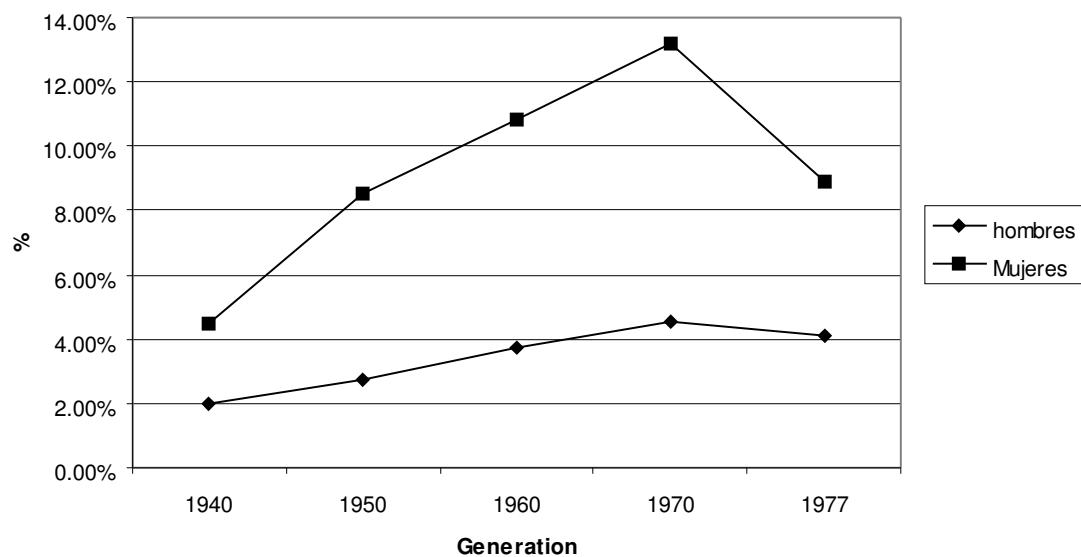
3	02.01	02.77	03.75	04.52	04.09
4 + 5	08.78	18.05	26.84	26.63	28.43
Total	100.00	100.00	100.00	100.00	100.00
<b>Females</b>					
1a	64.54	45.31	32.08	16.23	13.03
1b	23.92	31.55	29.17	27.07	23.04
2	03.44	07.64	14.09	25.07	28.28
3	04.48	08.52	10.85	13.17	08.90
4 + 5	03.61	06.99	13.82	18.45	26.75
Total	100.00	100.00	100.00	100.00	100.00



**GRAPH 5: Educational Level 2 by Gender**



**GRAPH 6: Educational Level 3 by Gender**

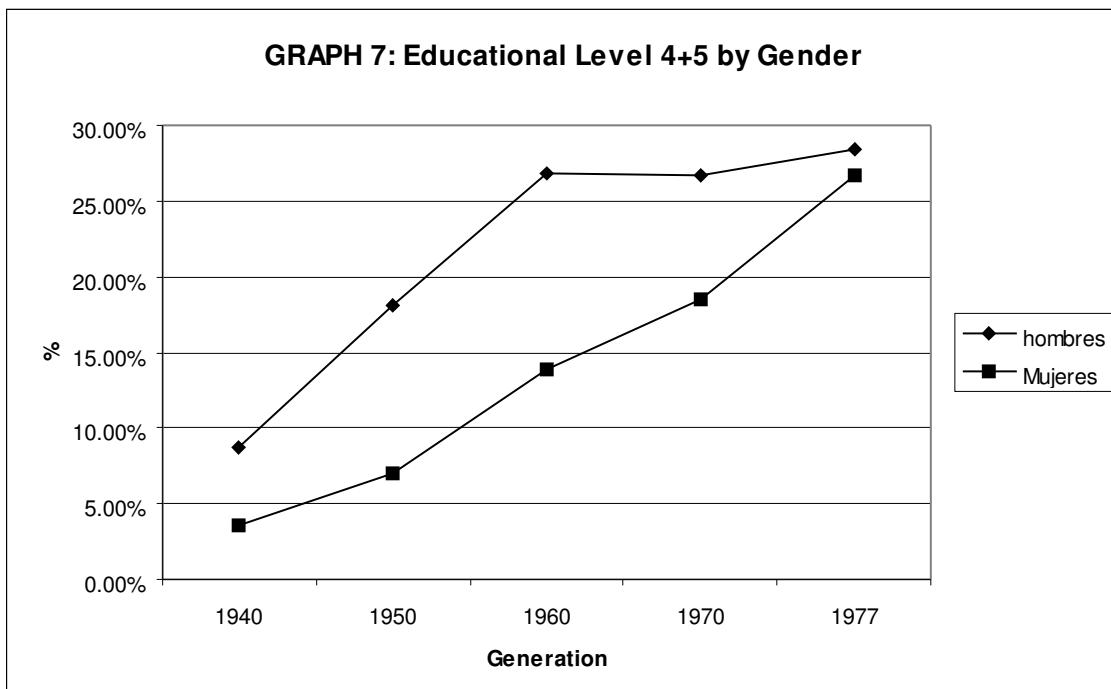


The presence of females among those who have finished “vocational studies” (level 3) is far above the presence of their male peers. This aspect requires an explanation of why the “female” specialties have grown more than the “male” specialties: political decisions and/or lower costs?

As seen in graph 7, growth at the levels of high school and higher education showed preference for males in the generations born before the 1960s, and almost exclusively for females in the generations born since the 1960s.

In short, we can state that educational expansion for females has been faster than that for males, especially since the 1960s and in higher education. The most recent generations of females are equivalent to the males in higher education and have

slightly greater presence in elementary school. A fact worthy of specific analysis is that Mexican females in all generations maintain vocational studies as “their own”.



*Effects of the Generations' Demographic Growth on the Evolution of the Number of Graduates (Absolute Values) per Level*

Up to this point, we have measured the growth of schooling of the analyzed generations in terms of the percentage structure of the educational level for each generation. For the Mexican case, and for comparative reasons, one must remember that this growth in “structure” is accompanied by an extraordinary demographic increase in the younger generations.

The combined effect of both increases has an exponential result, as shown in Chart 3. In Mexico, relatively weak percentage increases, in comparison with the results in the EU, are translated into very elevated growth if we measure them in terms of the absolute numbers of graduates. In the European case, the evolution of the size of the generations has a weak effect in countries such as Germany and France, or a clearly negative effect in Spain and Italy, as we shall see below.

Therefore, the greatest difference in the measurement of educational expansion is found between its calculation in structure and in effective graduates (the absolute number of graduates per level, obtained by multiplying the percentages of graduation by the size of each generation). The difference between the measurement in percentages and in absolute numbers of graduates is essential information if we want to analyze the impact of a growing level of schooling on the labor market. The percentages and absolute numbers represent information on two distinct phenomena.

On one hand, the information on the structure of graduates (percentage of each degree level within a generation) provides us with information on the behavior of the young people and their families. Such information is an essential explanatory element of educational expansion and its future. Yet it does not provide us with clear evidence of the number of young people enrolled in the school system; it does not indicate the

level or the number of young people who will enter the employment market after each educational level. Without doubt, the evolution of effective graduates from each generation who have completed each educational level gives us a measurement of the educational demand satisfied by the corresponding system, as well as a measurement of the supply in the employment market, which must be matched by the demand. Employers are not interested in knowing the proportion of a generation that has attained a certain educational level; they want to know how many individuals from each generation have acquired that level.

The available data indicate (Chart 3) that, based on the evolution of the total high school or college graduates (the set of those who have the condition to enter college, whether or not they have enrolled or received a college degree), the evolution of effective graduates is incredibly faster than the evolution of percentages (structure). While the percentage within the generation increases fourfold between individuals born in 1940 and 1980 (from 6% to 25%), the number of graduates is multiplied by 18, because of the effect of the underlying demographic expansion.

This phenomenon has various consequences: in first place, clear effects on the labor market, which witnesses the growing labor supply in terms of quantity and quality, with young generations that are broadly and better trained. In second place, the phenomenon will have an influence on educational policies and financing, which have been required to absorb the demographic explosion of the most recent generations, while students have been increasing their educational level.

CHART 3

*Evolution in Effective Graduates with a High School Degree or More (Levels 4+5 in EDEX nomenclature)\**

Generation	Generation with high school or college diploma (%)	Effective graduates**	Born in 1940 = 100
1940***	6	26 378	100
1950	13	87 307	331
1960	21	218 185	827
1970	23	328 280	1245
1980	28	507 984	1926

\* Result of multiplying the evolution of the percentage by the size of each generation.

\*\* Calculation based on the 2000 census, the nearest census to the date of ENE (1999), used to calculate the percentages of diploma recipients.

\*\*\* Calculation based on population 10 years from the 1950 census.

*Structure by Diplomas of the Economically Active Population by Generation: Female Protagonists of Change in the Labor Supply*

As predictable, the educational level of the economically active population is higher than that of the population in general, since those with most schooling tend to be more economically active. This difference is important among the females.<sup>6</sup>

If we consider the educational level of economically active Mexicans who are present in the labor market, the number is appreciably higher than that of the total population (Chart 4).

CHART 4

*Percentage of Educational Level by Generation (Total Percentages and Percentages by Gender) within the Economically Active Population*

Schooling	1940	1950	1960	1970
Total				

1A	63.88	38.70	23.42	12.14
1B	21.03	29.09	26.13	24.20
2	04.33	10.50	16.95	28.18
3	03.21	05.61	07.97	08.53
4 + 5	07.54	16.11	25.53	27.05
Total	100.00	100.00	100.00	100.00
<b>Males</b>				
1A	62.61	38.86	22.59	11.92
1B	21.96	28.07	26.65	25.90
2	04.35	11.72	19.75	30.89
3	02.17	02.78	03.75	04.53
4 + 5	08.91	18.56	27.26	26.76
Total	100.00	100.00	100.00	100.00
<b>Females</b>				
1A	67.48	38.34	25.00	12.69
1B	18.40	31.35	25.15	21.11
2	04.29	07.77	11.63	21.48
3	06.13	11.92	15.99	16.58
4 + 5	03.68	10.62	22.24	28.14
Total	100.00	100.00	100.00	100.00

As the above chart shows, the numbers are quite different by gender. The males show slight differences while the females show very important differences. In other words, the difference between the educational level of females who have entered the labor market in recent decades and that of their peers who have remained inactive is very significant; conversely, the females' rate of activity is very sensitive to their educational level. The relation is direct: the greater the schooling, the greater the rate of activity.

The size of the phenomenon is such that for generations born in the 1970s, the educational level of the economically active population of females is higher than that of the males.<sup>7</sup> If we add the considerations expressed previously with regard to the growth of the educational level of females in generations starting in the 1960s, we have an image that indicates that the females have been the protagonists of the changes that have occurred in the labor supply in recent decades.

### An International Comparison: Mexico-European Union

Due to the differences in the demographic trends of nations in the EU and Mexico (which have had opposite trajectories in recent decades), a comparison of their educational growth requires addressing the topic in parallel form in terms of structure (percentages) of the educational level of the generations and the evolution of the number of graduates.

#### *Evolution Compared to the Structure of the Educational Level of the Generations in Mexico and the EU*

A comparison of the structure of diplomas of the Mexican population and that of the EU nations studied in EDEX (Chart 5, and Annex 1 for the educational levels of the nations of the EU) indicates that considering the total population, those born in the 1940s and

1950s have data in structure that are not far from those of the least developed European nations: Spain and Italy. The differences, always in structure and for the total population, increase for later generations.

The same does not occur for the economically active population. In the EU, the differences in the structure of the total population and the economically active population are not important, yet they are essential for Mexico. We observe that the structure of diplomas of Mexico's economically active population is quite close to that of the nations of the EU.

CHART 5

*Structure by Diplomas of the Generations Studied in Mexico/Europe*

Generation	G	UK	Fr	It	S	Mexico	
						Total Pop.*	Economically Active Population
<b>1940</b>							
1 a: no formal studies	9	39	28	56	32	61	54
1b: diploma compulsory edu.	24	—	27	—	57	25	23
2: 1 <sup>st</sup> part secondary	1	9	6	23	—	4	5
3: vocational	51	34	20	3	3	3	4
4: 2 <sup>nd</sup> part secondary	—	3	7	12	2	1	3
5: college	14	16	12	5	6	5	11
<b>1950</b>							
1a	8	24	18	31	12	42	40
1b	14	—	18	—	63	30	29
2	2	12	7	34	—	10	10
3	53	38	30	5	5	6	6
4	—	4	10	20	8	3	4
5	21	22	17	10	13	10	12
<b>1960</b>							
1a	9	16	23	10	4	27	23
1b	11	—	4	—	54	28	26
2	3	23	9	43	—	17	17
3	56	30	31	7	14	7	8
4	—	7	12	30	12	6	8
5	22	25	21	10	16	15	18
<b>1970:</b>	<b>1965-66</b>	<b>1973-74</b>	<b>1972</b>	<b>1968-72</b>	<b>1972</b>	<b>1970</b>	
1a	8	11	16	6	2	15	12
1b	9	—	1	—	38	26	24
2	3	23	5	41	—	28	28
3	58	31	23	7	20	9	9
4	—	9	18	39	18	8	9
5	20	26	37	7	23	15	19

\*Based on microdata from ENE 1999.

Source: EDEX- Europe (Béduwé and Planas 2002) and author, based on ENE 1999 and ENE 2000 (published data). Comparative analysis of the evolution of the number of graduates from "high school or higher education" in Mexico and EU.

To compare evolution in absolute numbers of graduates, we shall use the sum of the two highest levels (4 + 5) as an indicator. In Mexico, this would correspond to graduates with a certificate from high school or college.

If we multiply the percentage data (structures) from the above section for each generation, by the size of each generation, we translate structures into effective graduates. The results (Chart 6) show that the growth in the number of graduates has been notably higher in Mexico than in the nations of the EU, including France and Spain, the fastest growing nations. This fact implies that the Mexican labor market is confronted by a large increase in the supply of labor that has a high degree of training, and that the productive integration of this group will require a much greater effort than the efforts made (with difficulty) by European economies in recent decades.

CHART 6

*Comparison (%) of Generation, in Absolute Numbers and with Base 100=1940 of the Evolution of Graduates of "High School or College" by Generation*

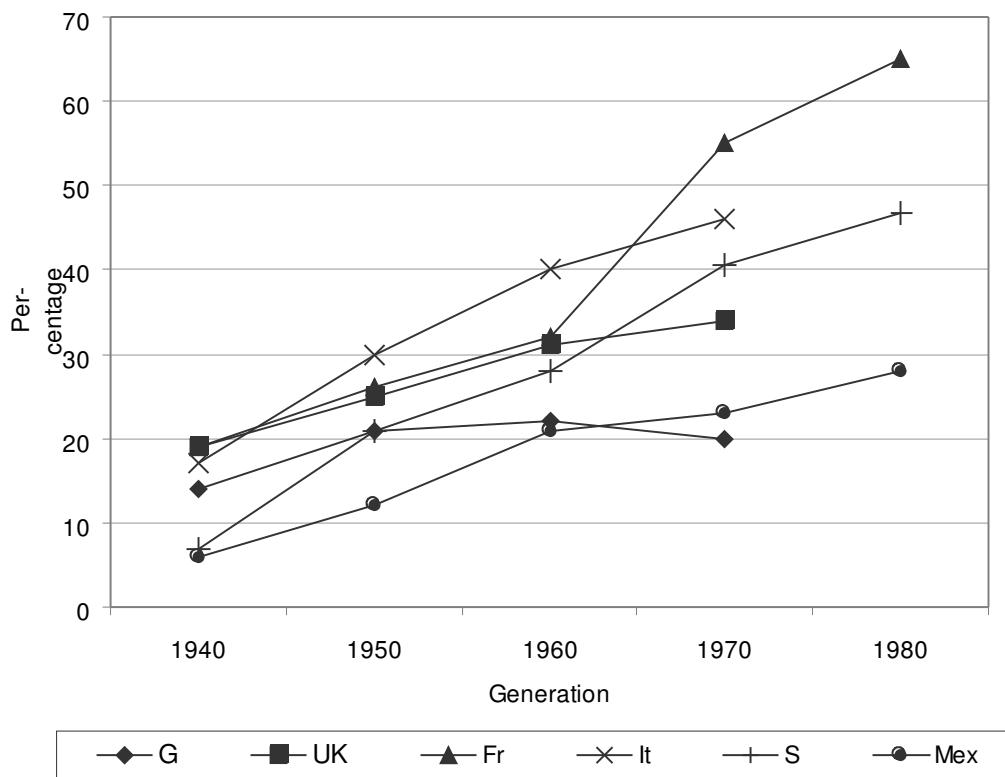
Genera-tion	G		UK		Fr		It		S		Mx				
	%	Effectiv-e	*	%	Effecti-ve	*	%	Effecti-ve	*	%	Effecti-ve	*	%	Effecti-ve	*
1940	14	196316	100	19	133380	100	19	106210	100	17	177901	100	8	46830	100
1950	21	170695	87	26	212680	159	27	231687	218	30	272586	153	21	118729	253
1960	22	213098	109	32	293760	220	33	269379	254	40	364076	204	28	185745	396
1970	20	162161	83	35	321300	241	55	448965	423	46	418688	235	41	272103	581
1980						65	520260	490					47	264952	565
														507984	1926

\*100 = 1940

Source: prepared by author, based on Béduwé and Planas 2002 and national census. For Mexico, ENE data and 1990 census.

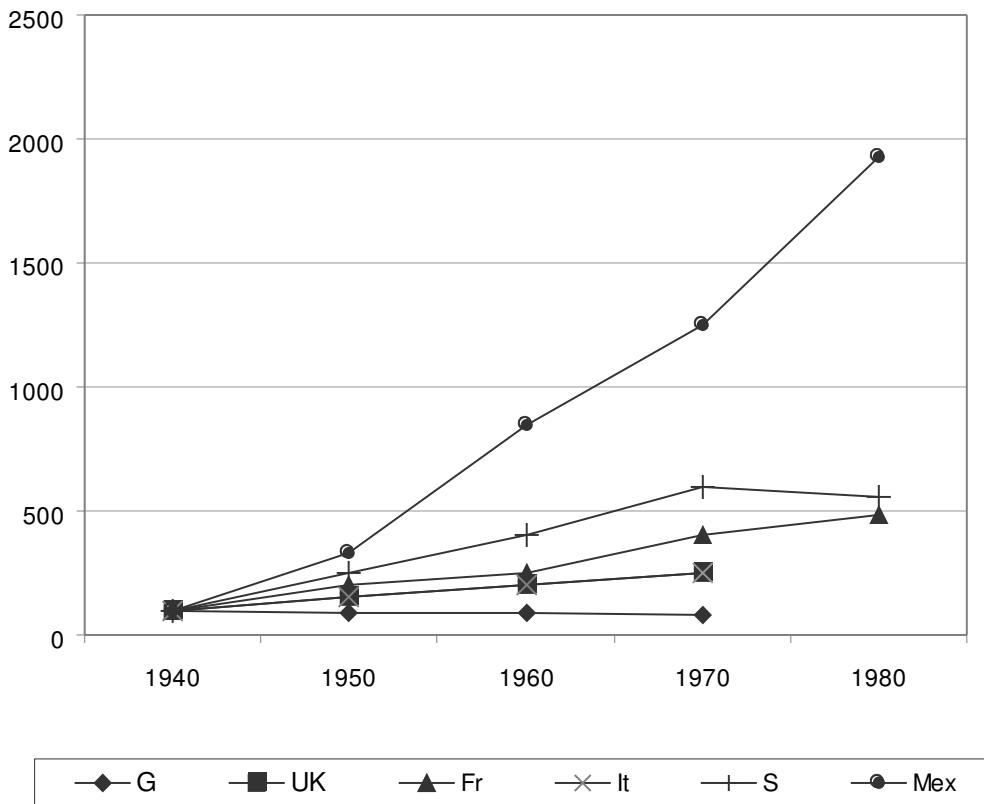
GRAPH 8

*Percentage of "High School or More" for Each Generation and Nation*



GRAPH 9

*Evolution of Number of Graduates of High School or More" by Generation or Nation (1940 = 100)*



While the growth in the number of graduates has been faster in the European nations (France and Spain), the increase of students who have finished high school is approximately 500%; the same indicator for the Mexican case is approximately 2000%. Thus our results show that the growth in the number of graduates of these levels has clearly been faster in Mexico than in the nations of the EU.

Thus the comparatively moderate growth of the educational level for the young Mexican generations, if measured as the structure of the level of diplomas, shows an impressive increase in absolute numbers. The effects of this growth in terms of the efforts made by institutions and educational financing is evident. But this phenomenon undoubtedly has had, and will continue to have, important effects on the Mexican labor market, which has benefited from an avalanche of young people certified at higher levels. How have companies managed such extraordinary abundance in the supply of degreed young people? This question will be the object of study of subsequent stages of EDEX-México.

## Conclusions

From the data presented, we can conclude that consistent educational expansion in Mexico in the second half of the 20<sup>th</sup> century has caused each generation to be more highly educated than the preceding generation. We can also conclude that this growth has been slower than in countries of the EU, if we take into account the generations' educational levels, although much faster if measured in terms of the number of graduates.

Supplementary efforts will be necessary if Mexico wishes to attain the educational levels of the nations of the European Union or of its direct competitors (Pallan, 1992).

The data presented indicate a qualitative phenomenon of great social and economic importance: the protagonists of educational growth at the higher levels in the past two decades have been almost exclusively females. Their leadership role has accelerated the growth of the educational level of the economically active population with respect to the population in general, since growth in females' educational levels has been accompanied by an increased rate of activity among the most highly trained females.

Hidden behind this description of educational expansion is a phenomenon of greater importance for the labor market: the change of the Mexican model for producing skills for the economy, as defined in the first paragraph of this article.

Still pending in the ongoing research is the matter of how sizable growth in the number of college graduates has affected their professional opportunities. The measurement of these opportunities is complex. The available results for the European Union (Béduwé and Planas, 2003) indicate that overall, companies have not acted "passively" toward the increased educational level of the labor supply. In other words, they have not restricted themselves to "superimposing" graduates, inevitably better trained, in jobs previously filled by individuals with less education, while maintaining the same wages, technology and organization.

In the European labor markets, the growth of the educational level of the labor supply has been rewarded, and the incorporation of more highly educated generations has been accompanied by technological and organizational changes in companies.

In the case of Mexico, some indications are available; a study published by ANUIES (2003), which compares wages by educational level in 1990 and 2000, shows that the wage difference by level among those who have finished high school and those who have finished college was almost 80% higher among the latter group in 1990: from 4,717 pesos to 8,380 pesos (year 2000), respectively. By the year 2000, this difference had increased to 125%: from 3,717 pesos to 8,320 pesos (ANUIES, 2003, first part, Chapter 6: 309-366). The above indicates that at least for holders of college degrees, increased education has also been rewarded in Mexico.

However, in terms of the labor market, the growth of diplomas poses two simultaneous questions in the regulation of the supply and demand, which can be formulated as follows: How will demand confront in a productive manner the expanded supply? A good response to this question depends in large part not only on economic development but also on the "economic and social" well-being of young generations, who are increasingly better trained and therefore have greater employment, economic and social expectations.

In terms of the quantitative (demographic) and qualitative (educational level) expansion of the labor supply, as described above, the good functioning of the economy depends to a large degree on companies' ability to resolve the processes of regulating demand and supply. This topic is present for companies in two settings: the external and the internal (Garnier, 1986). In the first place is the "external" problem of information concerning the productive potential of individuals the company must employ without knowing them directly- which leads to a problem of "external regulation" in hiring personnel based on signs (diplomas) produced fundamentally by the school system.

But according to Garnier, this is not the fundamental topic. Making a good selection of individuals to hire does not imply that they are productive. Still pending is the problem of "internal regulation" to create the conditions in the company to make potentially productive individuals truly productive. The implication, as seen in the case of the EU (Béduwé and Planas, 2003), is to introduce technological changes, in addition

to organizational and procedural changes, that support the highest trained, most competent and therefore most demanding and expensive employees.

The data presented by the ANUIES study (2003) on maintaining the “prices” of professionals in Mexico, in spite of the high growth of graduates, is a good indicator that something must be happening in the modification of a sizable part of occupations and the behavior of employers and human resource professionals, who hire university graduates in a “productive” manner. A deeper analysis of this topic will be the object of subsequent phases of the EDEX-Mexico research.

## Annex 1

### Education Levels and National Definitions

Prepared by H. Steedman (LSE) and J. Vincens (LIRHE)

- 1a Some elementary: in the United Kingdom, “no qualifications”; in France, “sans diplôme”; in Italy, “licence école primaire ou sans titre” (not separated in data); in Germany, “without diploma or unanswered”; in Spain, “sin estudios”.
- 1b Some secondary: in France, “certificats d’études primaires”; in Spain, “primarios”; in Germany, “Hauptschule”.
- 2 Secondary and some high school: in the United Kingdom, “O Level”, “CSE”, “GCSE”; in France, “BEP”; in Germany, “Realschule”; in Italy, “diplomati della scuola media”; in Spain, “bachillerato elemental”, “EGB ciclo superior”.
- 3 Vocational: in the United Kingdom, “others”, “Trade Apprenticeship”, “City & Guilds”, “ONC/OND”, “NVQ 2/3”; in France, “CAP/BEP”; in Germany, apprenticeships, “BFS”; in Italy, “diplomati de la scuola professionale”; in Spain, “FP”.
- 4 High school diploma (access to higher education): in the United Kingdom, “A Level”; in Germany, “Abitur” and “Fachhochschulreife”; in France, “baccalauréats”; in Italy, “Maturita”, “diplomi de Magistero”, “Scuola Tecnica”; in Spain, “bachillerato superior”, “BUP”, “cou”.
- 5 University or technical higher education: in the United Kingdom, “degrees”, “HNC/HND”, “teaching and nursing”; in France, “licences et plus”, “diplômes de Bac+2”; in Germany, university degrees, “Meister” and “Techniciens”; in Italy, “diplomi universitari”; in Spain, “títulos universitarios cortos y largos”.

Like any nomenclature, this system has its weaknesses, and in particular category 2—certificates from the lower level of secondary school. The meaning of this level has changed in various countries that have made it compulsory.

## Notes

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<sup>2</sup> The EDEX-Mexico study has five phases: 1) comparative analysis of educational expansion; 2) distribution of growth of education in occupations; 3) rewards of growth of education; 4) behavior of employers with regard to educational expansion; and 5) future perspectives.

<sup>3</sup> We do not know the educational level of generations born after 1980 because some of them are still concluding their studies.

<sup>4</sup> The tables and graphs in this section were prepared by the author, based on data from the national employment survey (Encuesta Nacional de Empleo—ENE) 1999 used by INEGI.

<sup>5</sup> We have used the generation of those born in 1977 because the available source (ENE 1999) indicates that they were 22 years old at the date of the interview. We presumed that all who would finish high school had done so by then.

<sup>6</sup> The conventions used to define the economically active population exclude women's work at home as an economic activity. The implication is that full-time housewives are considered inactive.

<sup>7</sup> The data reflected for those born in 1977 (see Note 5), with regard to the economically active population are not indicative of the generation's behavior. The data are distorted since those who are studying are not active. However, by taking into account the data for preceding generations who have completed their studies, it is very probable that this phenomenon will be repeated for these generations once they have finished their studies.

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