SCITECH

RESEARCH ORGANISATION

Youth Unemployment in the States of Mexico

Jesus Salgado Vega , Maria del Carmen Salgado Vega, Sara Quiroz Cuenca

Universidad Autonoma del Estado de Mexico, Facultad de Economia CU s/n C.P.50110 Cerro de Coatepec Toluca, Mexico.

Abstract

This research, through the decomposition of unemployment in seasonality, trend and cycle, shows that youth unemployment has larger dimensions than general unemployment, that through an analysis of the Mexican States, we find unemployment in each of them has a great variety in ways that are different over time and that to solve or take economic policy measures to alleviate youth unemployment, it is important to consider the temporal factors that affect it.

Keywords: Youth Unemployment; Seasonality; Trend; Cycle; Economic Policy; Short; Medium and Long-Run.

1. Introduction

Unemployed persons, as described in international standards, should conform to three criteria: (a) not working in the reference period, (b) being available for work, if they were offered a job in the week prior to the reference period, and c) had been actively seeking work, for at least 30 days. According to international standards, conventional ways of finding employment are scarce and sometimes, the labor market is chaotic and it is difficult to get a job where the recruitment of labor is inadequate or the work force is composed of some people with independent employment (ILO, 2015)

According to Hanan Morsy (2012), young people generally find it harder to find a job than older workers, for various reasons: less experience, fewer contacts, less knowledge about the labor market, etc. Further, many young people lack the requisite skills; most of the time, this is due to the educational system. Employers also have reservations about the productivity of young workers. Young people who are able to find employment are more vulnerable than older workers because, in general, the one hired last is the first to be dismissed, during hard times.

From the outbreak of the global crisis in 2008, youth unemployment accelerated in comparison to that of adults, especially in Europe. Unemployment among young people is worrying, especially to those who are looking for their first job. In advanced economies, 2 out of 10 unemployed youths have been seeking employment for a year or more; prolonged unemployment is alarming because it results in deterioration in the skills of potential workers. In 2005, 78.7 million young people were unemployed and in 2009, in the most critical phase of the crisis, the number was 76.6 million, though it dropped to approximately 73.4 million in 2015. Over a period of 10 years, from 2005 to 2015, the youth workforce has fallen to 46 million, while the number of young unemployed has decreased by 5.3 million (ILO, 2015).

Unemployment rates in developing regions are expected to increase slightly over the next few years. Unemployment also exists in low-income countries, but remains a phenomenon mainly associated with young people from the higher income strata, seeking to obtain one of the few jobs available in a reduced formal sector. The services sector (ILO, 215) is the major employer of young people in a majority of the countries.

For the year 2010, in Mexico, more than half of the total population consisted of people under 29 years of age. Considering that the youth population is between 14 and 29 years, it is worth noting that on an average, during the period 2000-2010, the figure amounted to 15.3 million people, *vis-a-vis* 35.7% of the corresponding total (Botello, J., 2013).

2. Youth Unemployment

2.1 Unemployment

Globally, there are more than 1 billion young people aged between 15 and 24 years, of which 89% live in developing countries. While the youth population increased by 13.2% between 1995 and 2005, the number of young unemployed increased by 14.8% and youth employment by only 3.8%. In the same period, the participation rate in the youth labor force fell from 58.9% to 54.7%; this is due to the permanence in school. In 2005 there were 657 million young people in the labor force, of whom 85 million (13.5%) were unemployed (Bassanini, A., & Duval, R, 2006).

When we compare adult unemployment rates with global youth unemployment rates, the latter are typically two to three times higher. The possibility of a young person being unemployed is three times that of an adult.

Young women have worse job prospects. In one quarter of industrialized countries, the rate of female youth unemployment exceeds that of men by more than 20%. Even more shocking is the fact that in more than 34 economies studied in the Caribbean and Latin America, the rates of female youth unemployment are above 50% (Bassanini, A., & Duval, R., 2006). Of the 98 economies for which recent data are available, no less than 51 have youth unemployment rates in excess of 15 per cent.

2.2 Unemployment in Mexico

Unemployment is a waste of resources: the economy produces below its potential capacity, so that the total output of goods and services is less than optimal. In addition, unemployment is not equitably distributed; it is usually higher in young people.

The National Institute of Statistics and Geography (INEGI) published the results of the National Survey of Occupation and Employment (ENOE) for the sixth month of 2015. During June 2015, unemployment rate at the national level was 4.4% of the Economically Active Population(EAP) , 2.2 million people in absolute terms, a decrease of 0.4% compared to the same month of 2014 (Forbes, 2015).

On the other hand, 95.6% of 52 million Mexicans of the EAP were employed. Six out of ten people, aged 15 and over, are occupied or looking to be employed, while four out of ten are dedicated to home, studying, retired or pensioned.

The employed population by sector of activity was distributed as follows: services accounted for 42.7%, Trade 19.4%, manufacturing 15.3%, agricultural activities 13.6%, construction 7.6%, other economic activities, including mining, electricity, water and gas supply 0.9% and the remaining 0.5% did not specify their activity.

The 20.1% of the unemployed had not completed secondary education, while those with a higher level of education accounted for 79.9%.

The 10 States with the highest unemployment in Mexico, according to their unemployment rate reported by INEGI were (Forbes, 2015):Nayarit and Tabasco 5.9%, State of Mexico 5.8%, Federal District 5.5%, Jalisco and Coahuila 5.2%, Sonora 5.1%, Mexico City, Nuevo León and Querétaro 5.0%, Durango 4.9%, Baja California Sur 4.8%, Baja California and Tlaxcala 4.7%, Tamaulipas 4.5%.

The majority of economic researches coincide in conceptualizing unemployment as: "The involuntary leisure of a person who is in the possibilities, with capacity and desire to work at established wages, but cannot find it" (Méndez, M. S., 1998).

In Mexico, at least one in twelve of the young workers are unemployed. Since the mid-1990s, the unemployment situation has been challenging, especially in developing countries such as Mexico.

Actually, young people who make up the workforce belong to the generation of educated and well-educated youth of all times in many countries.

For millions of people, globalization and technological change have created uncertainty and insecurity; these phenomena have widened the gap between young people in the labor market and experienced workers. Young people do not achieve a secure insertion in the market, resulting in their being unemployed or working in low paid jobs, with little future, little protection and security and without real prospects for the future. Hundreds of millions of young people also work long hours for a small wage and without social protection and in the informal economy (INEGI. 2014).

Training is a determining factor for economic growth and social development. Education and training systems play an important role in preparing young people to adapt to rapid changes in the labor market. Young people and employees are affected by the loss of the validity of their knowledge and the rapid changes in the organization of work and must therefore prepare themselves to continue looking for a way to face these changes. Incentives are needed to promote greater and continued investment in training and learning and to help finance mechanisms for lifelong learning.

In many countries where boys and girls have equal access to education, girls have been found to perform better at school. However, in many other countries, girls are not given the same educational opportunities as boys, resulting in a serious difference in the level of literacy among genders. Even without these differences in education systems, in general, young women have always found it more difficult than men to enter and remain in the workplace, either because of discriminatory policies, structural barriers or cultural prejudices.

The economic crisis increased the number of unemployed by up to 22 million in 2009, said OIT in its annual Global Employment Trends for Women report; the global economic crisis created new obstacles along the way towards sustainable and socially equitable growth, and made decent work even more difficult for women. The report notes that of the 3 billion people employed in the world in 2008, 1.2 billion were women, accounting for 40.4%. In 2009, the global unemployment rate for women increased to 7.4%, compared with 7% for men (ILO, 2009). Existing differences are accentuated by unequal access to information and communications technologies (ICTs).

Carmeci and Mauro (2003) point out that young people need to acquire specific knowledge of the company through work, so that their human capital acquired through education can be productive.

Botello (2013) calculates the expanded unemployment rate for the young population group at 17.9%, more than double that of the adult population on an average. By gender, it was 12.9% for men and 25.4% for women. It also calculates for the period 2000 to 2010 that the population of not employed not in education (NEE) amounted to 1.2 million people, of whom 46% are men and 54% are women. During the period 2000-2008, it estimated the relative growth of the young migrant population, in this case from 15 to 29 years, from 32% in 2000 to 46% in 2008.

Unemployment in Mexico affected 2 million 681 thousand people, 5.1% of the population in working age and working conditions, the highest level since 2011. Among young people seeking work, unemployment reached 10% of the population, practically double the national rate. The unemployment rate averaged 5.2% in 2011, fell back to 5% a year later and fell further to 4.9% in 2013. From that point, it continued to fall in January and February 2014, when it stood at 4.8% and 4.7%, to rebound in the following month to 5.1% (OECD, 2014).

According to OCDE (2014), among young Mexicans up to 24 years of age who are seeking employment, the unemployment rate in March of 2014 reached 10 percent, which means that one out of every ten young people looking for work does not found it. This indicator surpassed the records of the previous two months, from 9.5% in January and 9.1% in February.

In addition to the above, INEGI (2014) points out that among the EAP, according to the most recent figures, the country's young population is 46.6%, of which 90.8% are employed, while those who do not work but seek to do so add up to 9.2%. Of the non-economically active population, which amounts to 53.4% of the youth population, 81% is not available, i.e., does not work or seek to do so and the balance 19%, despite not working, consider doing so.

30.6% of the youth do not attend school and 69.4% are students. Of the first-mentioned percentage, of the universe of those young people who do not attend school and are not engaged in domestic tasks, the majority, 69.1%, do not have an "identifiable activity", 19.9% have a disability and the remaining 11% is occupied in tasks like purchases and / or formalities, remodeling and maintenance of the house.

Of those young people who do not attend school and are dedicated to the home, most do not have an interest in joining the labor market. While only 19.1% are available, the other 14.3% is not available due to constraints such as childcare, elderly care, sick care or prohibition from the head of the family and 1.1% have advanced disability.

The majority of the young people mentioned in the previous paragraph are women, 89.2%, of the universe of young people who work in a subordinate and remunerated way, are 77.4%, and those who still lack monetary remuneration, 14.4 %. Finally, it is important to note that young people who work, 26.8% work in the informal sector and 3.7% in paid domestic work.

According to Reyes (1995), there are three types of unemployment within an economy: frictional unemployment (search for job or for better job opportunities), structural unemployment (mismatch between supply and demand of workers) and cyclical unemployment (unemployment due to Aggregate Demand). It refers to the fluctuation in unemployment caused by business cycles.

3. Methodology

A univariate time series model has some unobserved components that capture their dynamics: thus we use regression on a trend and seasonal dummies and we capture the cyclical dynamics by allowing for ARMA effects in the regression disturbances.The full model, with monthly data is:

1

$$y_t = \beta_1 time + \sum_{i=1}^{12} \gamma_i D_{it} + \varepsilon_t$$

$$\Phi(L) = 1 - \varphi_1 L - \cdots - \varphi_p L^p$$

$$\Theta(L) = 1 + \theta_1 L + \cdots + \theta_q L^q$$

$$\upsilon_t \approx WN(0, \sigma^2)$$

Where y_t is unemployment, D is 1, for month i, and 0 for any month.

$$\Theta(L) = 1 + \theta_1 L + \cdots + \theta_q L^q \qquad\qquad 2$$

This is the general finite order moving average process of order q, i.e, the qth-order lag operator polynomial.

$$\Phi(L) = 1 - \varphi_1 L - \cdots - \varphi_p L^p \qquad\qquad 3$$

This is the pth-order lag operator polynomial of the autoregressive process.

The disturbances follow ARMA (p,q) process, of which pure autoregressions and pure moving average are special cases. In any particular application, of course, various trend effects, seasonal and ARMA cyclical effects may not be needed and so could be dropped, i.e., we can have models that are only cyclical, only seasonal or only trending; finally it is the underlying innovation that drives everything.

Basically, we modeled step by step, first the trend in which coefficients have to be statistically significant, then observing the residual plot and their correlogram, the seasonal variables were included in the model and at last, the ARMA model, taking only the significant coefficients until the residual plot revealed no pattern; instead the residuals look like white noise, as they should. The residual sample autocorrelation and partial autocorrelation display no patterns and are mostly inside the Bartlett bands.

The values of Schwarz and Akaike criteria were used to choose the combinations of ARMA(p,q) model; When there is a difference in the chosen model by the two criteria, then we select the more parsimonious model (Diebold, X. F., 2011).

The data for this research was taken from ENOE (2015) , during the period 2005 first quarter (I) to 2014 second quarter (II), for people of 15 to 24 years old for each of the States of Mexico.

4. Analysis

The results of the models for each State are presented below, highlighting the year and the highest unemployment rate in column 2 of table 1, the number of unemployed youth, the quarter of higher unemployment in a year according to seasonality , the unemployment rate, the quarterly unemployment growth rate, the duration of unemployment and the type of cycle model.

Table 1. Youth unemployment 2005 I -2014 II							
			Seasonality			Cycle	
State	**Period of higher unemployment**	**Unemployed**	**Quarter**	**%**	**Trend (growth)**	**Duration (quarters)**	**Type**
National	2009.III	1188370	III	10.40%	1.26%	8	AR(1)
Aguascalientes	2011.III	17385	III	9.33%	1.1%	16.11	AR(2)
Baja California	2009.III	39850	IV	9.86%	4.7%	13.2	AR(2)
Baja California Sur	2013.III	9369	III	7.85%	3.9%	11.72	AR(2)

Campeche	2012.I	14961	III	8.05%	1.5%	18.5	ARMA(2,2)
Chiapas	2013.IV	28767	III	9.66%	1.1%	20.13	MA(2)
Chihuahua	2009.III	51785	III	9.91%	2.0%	9.8	MA(2)
Coahuila	2009.I	46314	III	10.30%	0.5%	15.19	ARMA(2,1)
Colima	2009.I	7097	III	8.36%	1.5%	17.35	ARMA(2,2)
Distrito Federal	2009.III	127010	III	11.41%	0.4%	13.05	ARMA(2,1)
Durango	2011.II	23633	III	9.03%	2.6%	13.33	AR(2)
Estado de México	2010.III	187130	III	11.70%	1.0%	15.71	AR(1)
Guanajuato	2009.III	76127	III	10.46%	2.3%	13.43	AR(1)
Guerrero	2011.III	18535	III	8.91%	2.4%	6.76	MA(2)
Hidalgo	2008.IV	24700	I	9.64%	0.9%	13.66	ARMA(1,2)
Jalisco	2011.III	99263	III	10.90%	1.5%	8.73	AR(2)
Michoacan	2009.II	40225	III	10.01%	1.1%	17.45	ARMA(2,2)
Morelos	2010.III	14025	III	9.13%	0.8%	9.38	ARMA(2,2)
Nayarit	2011.III	14956	III	8.76%	2.6%	----	without cycle
Nuevo León	2009.III	80043	III	10.91%	0.0%	10.65	AR(1)
Oaxaca	2012.III	27185	III	9.34%	0.0%	6.98	ARMA(2,2)
Puebla	2013.III	52308	III	10.44%	0.8%	6.8	ARMA(2,2)
Queretaro	2009.II	29435	III	9.53%	1.0%	17	MA(1)
Quintana Roo	2009.III	17719	III	9.07%	1.8%	10	AR(2)
San Luis Potosi	2009.III	22036	III	9.56%	1.2%	18.1	AR(1)
Sinaloa	2013.III	35323	III	9.91%	1.3%	----	Without cycle
Sonora	2011.III	40771	III	9.74%	2.7%	----	Without cycle
Tabasco	2010.III	30289	III	9.48%	2.3%	14.15	AR(1)

Tamaulipas	2013.III	52319	III	10.32%	1.6%	13	MA(1)
Tlaxcala	2009.III	18293	III	9.45%	0.4%	----	Without cycle
Veracruz	2011.III	61724	III	10.19%	1.8%	----	Without cycle
Yucatan	2012.III	18422	III	9.60%	without trend	6.6	ARMA(1,1)
Zacatecas	2011.III	18333	III	9.49%	without trend	10.3	AR(1)

The analysis of each State is as follows.

National: Mexico is a country with 120, 527,797 inhabitants, of which 17.74% is in the range of 15-24 years of age, or 21,378,289 people, of which 9,331,058 are considered EAP, i.e, 43.65%. The EAP includes those who are unemployed and are in search of a job. During the time of crisis, youth unemployment reached rates of 11.45%, higher than 6.1% for the aggregate economy (INEGI, 2015).

The seasonality of youth unemployment at the national level is recorded during the third quarter of each year, with an average of 10.40% in each quarter. The national trend is 1.26% on a quarterly basis. The sector of tertiary activities is the one that employs the youngest, followed by the industrial sector and finally the primary sector. The period with the highest unemployment is the third quarter of 2009 with a total of 1,188,370 young people.

The cycle of the national variable is recorded for a period of 8 quarters between the valley and the peak of the series. The model obtained for this analysis is of type AR (1). The trajectory of the cycle is characterized by an explosive and direct convergence-shape without fluctuation.

Aguascalientes: The seasonality of youth unemployment is higher in the third quarter and lower in the second quarter of each year. It registers a 9.33% average in each quarter. The predominant sector is the tertiary sector, where most young people have been working. The trend in this state is 1.1% in quarterly average. The period of highest unemployment, is the third quarter of 2011, when17,385 young people were unemployed.

The cycle of the variable registers a duration of 16.11 quarters between the valley and the peak of the series. The model obtained for this analysis is of type AR (2). The trajectory of the cycle is characterized by a uniform fluctuation of sinusoidal form, which converges to the equilibrium.

Baja California: The seasonality of youth unemployment occurs in the fourth quarter of each year and an average of 9.86% is recorded. The predominant sector is the tertiary sector. The trend is 4.7% on a quarterly basis. The period with the highest unemployment is the third quarter of 2009, with 39,850 young unemployed people.

The cycle of the variable records a duration of 16.1 quarters between the valley and the peak of the series. The model obtained is of type AR (2). The trajectory of the cycle is characterized by a uniform fluctuation of sinusoidal form, which converges to the equilibrium.

Baja California Sur: Seasonality indicates that unemployment is higher in the third quarter and lower in the fourth quarter. The predominant sector is the tertiary sector. The seasonality of youth unemployment in the three sectors coincides, increases in the second quarter, except in the primary sector where it decreases slightly, falls in the third sector and falls again in the fourth. The highest increase is in the second quarter and the sharpest decline, in the third quarter of each year.

The cycle of the variable records a duration of 13.2 quarters between the valley and the peak of the series. The model obtained is of type AR (2). The trajectory of the cycle is characterized by a uniform fluctuation of sinusoidal form, which converges to the equilibrium.

Campeche: Seasonality is higher in the third quarter and lower in the fourth quarter. The predominant sector is the tertiary sector. Seasonality in the three sectors coincides, increases in the second quarter, falls in the third sector and increases in the fourth quarter. The highest increase is in the second quarter and the sharpest decline, in the third quarter of each year.

The cycle of the variable records a duration of 18.5 quarters between the valley and the peak of the series. The model obtained is of type ARMA (2, 2). The trajectory of the cycle is characterized by a uniform fluctuation of sinusoidal form, which converges to the equilibrium.

Chiapas: Seasonality is higher in the third quarter of the year and lower in the second quarter. The predominant sectors are tertiary and secondary. Seasonality in the three sectors coincides, increases in the second quarter, falls in the third sector and falls again a little in the fourth. The highest increase is in the second quarter and the sharpest decline, in the third quarter of each year.

The cycle of the variable records a duration of 20.13 quarters between the valley and the peak of the series. The model obtained is of type MA (2). The trajectory of the cycle is characterized by a uniform fluctuation of sinusoidal form, which converges to the equilibrium

Chihuahua: Seasonality is higher in the third quarter of the year and lower in the second quarter. The predominant sectors are tertiary and secondary. Seasonality in the three sectors coincides, increases in the second quarter, falls in the third sector and falls again in the fourth quarter. Further increase in the second quarter and the steeper decline in the third quarter of each year.

The cycle of the variable records a duration of 9.8 quarters between the valley and the peak of the series. The model obtained is of type MA (2). The trajectory of the cycle is characterized by a uniform fluctuation of sinusoidal form, which converges to the equilibrium.

Coahuila: Seasonality in the three sectors coincides, increases in the second quarter, falls in the third sector and falls again in the fourth quarter, with further increase in second quarter and greater reduction in third quarter of each year.

The cycle of the variable records a duration of 15.19 quarters between the valley and the peak of the series. The model obtained is of type ARMA (2, 1). The trajectory of the cycle is characterized by a uniform fluctuation of sinusoidal form, which converges to the equilibrium.

Colima: Seasonality in the three sectors coincides, increases in the second quarter, falls in the third sector and rises in the fourth. The highest increase is in the second quarter and the sharpest decline in the third quarter of each year.

The cycle of the variable records a duration of 17.35 quarters between the valley and the peak of the series. The model obtained is of type ARMA (2, 2). The trajectory of the cycle is characterized by a uniform fluctuation of sinusoidal form, which converges to the equilibrium.

Distrito Federal: Seasonality is higher in the third quarter of the year and lower in the fourth quarter. The predominant sector is the tertiary sector. Seasonality in the three sectors coincides, increases in the second quarter, falls in the third sector and falls again in the fourth.

The cycle of the variable records a duration of 13.05 quarters between the valley and the peak of the series. The model obtained is of type ARMA (2, 1). The trajectory of the cycle is characterized by a uniform fluctuation of sinusoidal form, which converges to the equilibrium.

Durango: Seasonality is higher in the third quarter of the year and lower in the second quarter. The predominant sectors are tertiary and secondary. Seasonality in the three sectors coincides, increases in the second quarter, falls in the third quarter and falls again in the fourth, with further increase in second quarter and the most pronounced decline in the third quarter.

The cycle of the variable records a duration of 13.33 quarters between the valley and the peak of the series. The model obtained is of type AR (2). The trajectory of the cycle is characterized by a uniform fluctuation of sinusoidal form, which converges to the equilibrium.

Guanajuato: Seasonality is higher in the third quarter of the year and lower in the second quarter. The predominant sector is the tertiary (service). Seasonality in the three sectors coincides, increases in the second quarter, falls in the third sector and falls again in the fourth quarter. The highest increase is in the second quarter and the sharpest decline in the third quarter of each year.

The cycle of the variable records a duration of 13.43 quarters between the valley and the peak of the series. The model obtained is of type AR (1). The trajectory of the cycle is characterized by an explosive and direct convergence-shape without fluctuation.

Estado de Mexico: The seasonality of youth unemployment at the national level is recorded during the third quarter of each year, with an average of 11.70% in each quarter. The trend is 1.0 % on a quarterly basis. The period with the highest unemployment is the third quarter of 2010, with a total of 187,130 young unemployed people.

The cycle of the variable records a duration of 15.71 quarters between the valley and the peak of the series. The model obtained is of type AR (1). The trajectory of the cycle is characterized by an explosive and direct convergence-shape without fluctuation.

Nuevo Leon: The seasonality of youth unemployment at the national level is recorded during the third quarter of each year, with an average of 10.91% in each quarter. This State does not have a trend, i.e., there is no long-term growth rate. The period with the highest unemployment is the third quarter of 2009 III with a total of 80,043 young unemployed people.

The cycle of the variable records a duration of 10.65 quarters between the valley and the peak of the series. The model obtained is of type AR (1). The trajectory of the cycle is characterized by an explosive and direct convergence-shape without fluctuation.

Jalisco: The seasonality of youth unemployment at the national level is recorded during the third quarter of each year, with an average of 10.90% in each quarter. The trend is 1.5 % on a quarterly basis. The period with the highest unemployment is the third quarter of 2011, with a total of 99,263 young unemployed people.

The cycle of the variable records a duration of 8.73 quarters between the valley and the peak of the series. The model obtained is of type AR (2). The trajectory of the cycle is characterized by a uniform fluctuation of sinusoidal form, which converges to the equilibrium.

Puebla: The cycle of the variable records a duration of 18.5 quarters between the valley and the peak of the series. The model obtained is of type ARMA (2, 2). The trajectory of the cycle is characterized by a uniform fluctuation of sinusoidal form, which converges to the equilibrium.

The seasonality of youth unemployment at the national level is recorded during the third quarter of each year, with an average of 10.44% in each quarter. The trend is 0.80 % on a quarterly basis. The period with the highest unemployment is the third quarter of 2013, with a total of 52,308 unemployed youth.

The cycle of the variable records a duration of 17 quarters between the valley and the peak of the series. The model obtained is of type MA (1). The trajectory of the cycle is characterized by a uniform fluctuation of sinusoidal form, which converges to the equilibrium.

Michoacan: The seasonality of youth unemployment at the national level is recorded during the third quarter of each year, with an average of 10.01% in each quarter. The trend is 1.1 % on a quarterly basis. The period with the highest unemployment is the second quarter of 2009 with a total of 40,225 unemployed youth.

The cycle of the variable records a duration of 17.45 quarters between the valley and the peak of the series. The model obtained is of type ARMA (2, 2). The trajectory of the cycle is characterized by a uniform fluctuation of sinusoidal form, which converges to the equilibrium

Queretaro: The seasonality of youth unemployment at the national level is recorded during the third quarter of each year, with an average of 9.53% in each quarter. The trend is 1.0 % on a quarterly basis. The period with the highest unemployment is the second quarter of 2009 with a total of 29,435 unemployed young people.

The cycle of the variable records a duration of 17 quarters between the valley and the peak of the series. The model obtained is of type MA (1). The trajectory of the cycle is characterized by a uniform fluctuation of sinusoidal form, which converges to the equilibrium.

Hidalgo: The seasonality of youth unemployment at the national level is recorded during the first quarter of each year, with an average of 9.64% in each quarter. The trend is 0.90 % on a quarterly basis. The period with the highest unemployment is the fourth quarter of 2008 with a total of 24,700 unemployed youth.

The cycle of the variable records a duration of 13.66 quarters between the valley and the peak of the series. The model obtained is of type ARMA (1, 2). The trajectory of the cycle is characterized by a uniform fluctuation of sinusoidal form, which converges to the equilibrium.

Oaxaca: The state's unemployment rate for the first quarter of 2015 was 3.2% (INEGI, 209). This state presents a constant behavior in the unemployment of its young people, with the exception of the third quarter of 2012, when the largest number of unemployed with a total of 27, 185 was generated.

The seasonality of youth unemployment at the national level is recorded during the third quarter of each year, with an average of 9.34% in each quarter. This State does not have a trend, i.e., there is no long-term growth rate. The period with the highest unemployment is the third quarter of 2012 with a total of 27,185 unemployed youth.

The cycle of the variable records a duration of 6.98 quarters between the valley and the peak of the series. The model obtained is of type ARMA (2, 2). The trajectory of the cycle is characterized by a uniform fluctuation of sinusoidal form, which converges to the equilibrium.

Guerrero: The seasonality of youth unemployment at the national level is recorded during the first quarter of each year, with an average of 8.91% in each quarter. The trend is 2.4% on a quarterly basis. The period with the highest unemployment is the third quarter of 2011 with a total of 18,535 unemployed youth.

The cycle of the variable records a duration of 6.76 quarters between the valley and the peak of the series. The model obtained is of type MA (2). The trajectory of the cycle is characterized by a uniform fluctuation of sinusoidal form, which converges to the equilibrium.

Morelos: The seasonality of youth unemployment at the national level is recorded during the third quarter of each year, with an average of 9.13% in each quarter. The trend is 0.80 % on a quarterly basis. The period with the highest unemployment is the third quarter of 2010 with a total of 14,025 unemployed young people.

The cycle of the variable records a duration of 9.38 quarters between the valley and the peak of the series. The model obtained is of type ARMA (2, 2). The trajectory of the cycle is characterized by a uniform fluctuation of sinusoidal form, which converges to the equilibrium

Nayarit: The seasonality of youth unemployment at the national level is recorded during the third quarter of each year, with an average of 8.76% in each quarter. The trend is 2.6 % on a quarterly basis. The period with the highest unemployment is the third quarter of 2011 with a total of 14,956 unemployed young people.

Quintana Roo: The seasonality of youth unemployment at the national level is recorded during the third quarter of each year, with an average of 9.07% in each quarter. The trend is 1.80 % on a quarterly basis. The period with the highest unemployment is the third quarter of 2009, with a total of 17,719 unemployed youth.

The cycle of the variable records a duration of 10 quarters between the valley and the peak of the series. The model obtained is of type AR (2). The trajectory of the cycle is characterized by a uniform fluctuation of sinusoidal form, which converges to the equilibrium.

San Luis Potosi: The seasonality of youth unemployment at the national level is recorded during the third quarter of each year, with an average of 9.13% in each quarter. The trend is 0.80 % on a quarterly basis. The period with the highest unemployment is the third quarter of 2010, with a total of 14,025 unemployed youth.

The seasonality of youth unemployment at the national level is recorded during the third quarter of each year, with an average of 9.56% in each quarter. The trend is 1.20 % on a quarterly basis. The period with the highest unemployment is the third quarter of 2009 with a total of 22,036 unemployed young people.

The cycle of the variable records a duration of 18.1 quarters between the valley and the peak of the series. The model obtained is of type AR (1). The trajectory of the cycle is characterized by an explosive and direct convergence-shape without fluctuation.

Sinaloa: The seasonality of youth unemployment at the national level is recorded during the third quarter of each year, with an average of 9.91% in each quarter. The trend is 1.30 % on a quarterly basis. The period with the highest unemployment is the third quarter of 2013, with a total of 35323 unemployed youth.

Sonora: The seasonality of youth unemployment at the national level is recorded during the third quarter of each year, with an average of 9.74% in each quarter. The trend is 2.70 % on a quarterly basis. The period with the highest unemployment is the third quarter of 2011 with a total of 40,771unemployed young people.

Tabasco: The seasonality of youth unemployment at the national level is recorded during the third quarter of each year, with an average of 9.48% in each quarter. The trend is 2.30 % on a quarterly basis. The period with the highest unemployment is the third quarter of 2010, with a total of 30,289 unemployed young people.

The cycle of the variable records a duration of 14.15 quarters between the valley and the peak of the series. The model obtained is of type AR (1). The trajectory of the cycle is characterized by an explosive and direct convergence-shape without fluctuation.

Tamaulipas: The seasonality of youth unemployment at the national level is recorded during the third quarter of each year, with an average of 10.32% in each quarter. The trend is 1.60 % on a quarterly basis. The period with the highest unemployment is the third quarter of 2013, with a total of 52,319 unemployed youth.

The cycle of the variable records a duration of 13 quarters between the valley and the peak of the series. The model obtained is of type MA (1). The trajectory of the cycle is characterized by a uniform fluctuation of sinusoidal form, which converges to the equilibrium.

Tlaxcala: The seasonality of youth unemployment at the national level is recorded during the third quarter of each year, with an average of 9.45% in each quarter. The trend is 0.40 % on a quarterly basis. The period with the highest unemployment is the third quarter of 2009, with a total of 18,293 unemployed young people.

Veracruz: The seasonality of youth unemployment at the national level is recorded during the third quarter of each year, with an average of 10.19% in each quarter. The trend is 1.80 % on a quarterly basis. The period with the highest unemployment is the third quarter of 2011, with a total of 61,724 unemployed youth.

The cycle of the variable records a duration of 6.6 quarters between the valley and the peak of the series. The model obtained is of type ARMA (1.1). The trajectory of the cycle is characterized by a uniform fluctuation of sinusoidal form, which converges to the equilibrium.

Yucatan: The seasonality of youth unemployment at the national level is recorded during the third quarter of each year, with an average of 9.60% in each quarter. This State does not have a trend, i.e., there is no long-term growth rate. The period with the highest unemployment is the third quarter of 2012, with a total of 18,422 unemployed young people.

The cycle of the variable records a duration of 6.6 quarters between the valley and the peak of the series. The model obtained is of type ARMA (1, 1). The trajectory of the cycle is characterized by a uniform fluctuation of sinusoidal form, which converges to the equilibrium.

Zacatecas: The seasonality of youth unemployment at the national level is recorded during the third quarter of each year, with an average of 9.49% in each quarter. This State does not have a trend, i.e., there is no long term growth rate. The period with the highest unemployment is the third quarter of 2011, with a total of 18,333 unemployed youth.

The cycle of the variable records a duration of 18.5 quarters between the valley and the peak of the series. The model obtained is of type AR (1). The trajectory of the cycle is characterized by an explosive and direct convergence-shape without fluctuation.

5. Conclusions

Nuevo Leon, Oaxaca, Yucatan and Zacatecas: these entities are in a special category because their youth unemployment does not have a trend with a duration of eleven years, that is to say, there is no long term growth of youth unemployment, which means that the movements of unemployment occur through seasonality that has a maximum duration of one year and also through the cycle with a duration of less than five years.

Nayarit, Sinaloa, Sonora, Tlaxcala and Veracruz: these entities do not present a cycle of unemployment in the medium term, which means that youth unemployment has long-term variations with the trend and short-term or less than one year variation with seasonality

With respect to the trend, the States of Baja California, Baja California Sur, Sonora, Durango and Tabasco present the highest long-term growth rates of above 2% quarterly, during the 11 years.

The seasonality of youth unemployment usually occurs in its greatest magnitude in the third quarter of the year, with the exception of Baja Californian, where it occurs in the fourth quarter of the year and in Hidalgo, where it occurs in the first quarter of the year.

The longest cycles were found in Chiapas, Aguascalientes, Campeche, Colima, Michoacan, Queretaro and San Luis Potosi, with a duration of over 4 years.

The States that present the highest absolute unemployment were State of Mexico, Federal District, Jalisco, Nuevo Leon, Puebla, Tamaulipas and Veracruz, with a level above 50 thousand unemployed, all of them in the third quarter and between years 2009 to 2013, which means that the crisis of the year 2009 affected States not only in the third quarter of 2009, but extended its effects to at least 4 years.

Considering seasonality tells us the quarter in which we must act with economic policies to alleviate youth unemployment. In respect of those States with a greater tendency, i.e., higher growth rate of unemployment in the long-run indicates that there is a structural problem.

The cycle indicates to us that the longer the duration, the longer the depression and where we would have to act with economic policies to cut the periods of depression and lengthen those of boom.

The employment situation has caused great difficulties; unemployment continues to affect millions of people around the world. This phenomenon is very important, since it harms not only the unemployed person, but also the development of the entire country and the world.

There are several factors that lead to a lack of full employment, among which we have economic factors like lack of growth of the economy, political factors such as inability to reach national agreements in which a country's direction is seen, social factors as social decomposition, coupled with the problems that this causes: delinquency, violence and family disintegration.

Unemployment in our country is a serious problem, since it affects millions of Mexicans in all its segments and primary women; the unemployment rates of men are lower than those of women.

Age is important in the likelihood of being unemployed; young people are more likely to be unemployed than the rest of the population.

ARMA model gives rise only to symmetric cycles, that is, upswings and downswings behaving in a symmetric fashion. This contradicts commonly observed cycles features, characterized by short and steep contractions and long and more moderate expansion periods. Nonlinear time series models are required to capture such phenomena (Goldrian, G., 2007).

The last paragraph suggests the importance of future studies with non-symmetric models, in order to have a more accurate measurement of the phenomena of the duration of unemployment.

References

[1] ILO. (2015) Tendencias Mundiales del Empleo Juvenil. International Labour Organization http://www.ilo.org/wcmsp5/groups/public/---dgreports/--- comm/documents/publication/wcms_412025.pdf.

[2] Morsy, H. (2012) Generación Marcada. https://www.imf.org/external/pubs/ft/fandd/spa/2012/03/pdf/morsy.pdf

[3] Botello, J. (2013) Desempleo juvenil en México, 2000-2010. Análisis Económico, XXVIII primer cuatrimestre (67).

[4] Bassanini, A., & Duval, R. (2006) Employment patterns in OECD countries: reassessing the role of policies and institutions. OECD Economics Department working paper.

[5] Forbes (2015) ¿Cuáles son los estados con más desempleo en México? http://www.forbes.com.mx/cuales-son-los-estados-con-mas-desempleo-en-mexico/#gs.DXRzvZk

[6] Méndez, M. S. (1998) Problemas económicos de México. México: Mc Graw Hill.

[7] INEGI. (2014) Panorámica de la Población Joven en México Desde la Perspectiva de su Condición de Actividad 2013.

[8] ILO. (2009) Tendencias Mundiales del Empleo de las Mujeres Marzo de 2009 http://www.ilo.org/wcmsp5/groups/public/@dgreports/@dcomm/documents/publication/wcms_106195.pdf

[9] Carmeci, G., & L., M. (2003). Imperfect Labor Market and Convergence: Theory and Evidence for Some OCDE Countries. Jornual of Policy Modelling, 838-856.

[10] OECD. Society at a Glance 2014 http://www.oecd.org/centrodemexico/medios/SAG2014-KeyFindings-Mexico%20ESPA%C3%91OL.pdf

[11] Reyes, F. (1995). Macroeconomía. México: Adisson-Wesley Iberoamericana, S.A.

[12] Diebold, X. F. (2011) Elements of forecasting, fourth edition, South-Wester, CENGAGE Learning.

[13] ENOE (2015). http://www.beta.inegi.org.mx/proyectos/enchogares/regulares/enoe

[14] INEGI. (2015). http://www3.inegi.org.mx/sistemas/Glosario/default.aspx?ClvGlo=ehenoe&s=est&c=10842&up.

[15] [15] INEGI. (2009) http://www.inegi.org.mx/est/contenidos/espanol/proyectos/censos/ce2009/pdf/RD09-resumen.pdf .

[16] Goldrian, G. (2007). Handbook of survey-based business cycle analysis, Info Economic Policy, Ed, Edwar Elgar, Chetenham UK..