

MEXICAN MAQUILA INDUSTRY OUTLOOK. A QUANTITATIVE SPACE-TIME ANALYSIS

TRÍVEZ, F. Javier*

REYES, Angel Mauricio

ALIAGA, F. Javier

Abstract

The aim of this article is to analyse the current situation and the short and mid term outlook of the maquila export industry in Mexico. The purpose is to carry out an analysis of quantitative economic conjuncture, by conveniently combining the necessary elements. Therefore, we have used an empiric base- relevant information expressed in monthly statistical time series of the Mexican value added of export income charged by maquila service (VAECMS) in national and state levels- and quantitative methods (statistical-econometrics techniques). Under this framework, we present a methodological proposal in order to analyse ARIMA models with outliers and calendar effects, then we use a reduced model for the signal extraction. The trend-cycle component is the most suitable way to consider the underlying evolution. From this component and from the growth rate and inertial behaviour we are able to extract the major conclusions of the current Mexican export maquila situation in general as well as in detail in the principal states of the country.

Keywords: Conjunctural Analysis, Signal Extraction, Underlying Evolution, Underlying Growth, ARIMA Models, Outliers, Forecast.

JEL Classification: C22, C49, C53, L69

1. Introduction

The Maquila Industry of Exportation (MIE) has played an important role in the industrialization process in Mexico. At the present time, this is one of the most strategic sectors, which supports an important part of the domestic economy (and its regions) especially before the

* F. Javier Trívez, Departamento de Análisis Económico, Facultad Ciencias Económicas, Gran Vía, 2-4, 50005-Zaragoza (Spain), e-mail: fjtrivez@unizar.es

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increasing linkage with international markets and the exporter orientation that characterizes the different spheres of production in the frame of an intense economic opening.

On the other hand, in recent years, many research studies that deal with the topic of the Mexican MIE, from diverse points of view of economy and other social sciences, have shown up. Many of these research studies have analysed historic aspects on the rise of the maquila industry, the public policies that favored them, their evolution as well as their expansion from the bordering states of northern Mexico towards other regions and federative entities or their general problems (Carrillo and Gomis, 2003; Dussel, 2003; Mejía, 2003; López, 2004; Villavicencio and Casalet, 2005). Other researchers deal with the study of specific cases (Almaraz, 1998; Carrillo and Hinojosa, 2001; Mendoza, 2001; Gerber and Carrillo, 2003) and even though many of these research studies on this subject have made important contributions in terms of diagnostics by sectors (Acevedo, 2002; Mendoza, 2002; Vargas, 2003; Mercier, 2005; Ollivier, 2005; Turner, 2006), there is still certain missing literature on research studies that focus explicitly on the analysis of the current situation and the short and mid term outlook with a quantitative focus that refer to this industry in Mexico and its global situation and much less that refer to detailed information at a regional level.

Precisely, the purpose of this article is to offer an alternative methodology for the quantitative analysis of the economic conjunctural Mexican maquila, which we believe is fundamental, not only to measure and follow-up on the evolution of this economic activity, but also to guide the decisions of the main economic agents (policy makers). Furthermore, it is essential for the definition and adoption of policies that are adequate not only at a national level but also in its regional and state levels of the country where this industry is established, dealing also with its possible perspectives from its global outlook to the regional and even local levels.

We understand that the analysis of quantitative economic conjuncture is an essential instrument in which the design of all economic politics should be based. Under this context it is important to include: (a) an evaluation and quantification of the past and current situation and of the economic reality under this analysis, (b)

quality forecasts, and (c) a diagnostic of the economic reality based on the results of the two previous items.

The necessary elements to elaborate all economic conjuncture analysis are: (i) the statistical information of the key variable which constitutes the reality under analysis, that is the empiric base and (ii) the group of statistical-econometrics methods that allow us to handle the available information properly and generate a series of results from which we can proceed to sustain the evaluation, forecast and diagnostic.

The empiric base of this work is constituted by the time series of the value added of export income charged by maquila service (VAECMS) in Mexico, referred both to the national and principal states in which the MIE is installed. Specifically, the states considered are: Aguascalientes, Baja California, Coahuila, Chihuahua, Durango, Guanajuato, Jalisco, Federal District, State of Mexico, Nuevo León, Puebla, San Luís Potosí, Sinaloa, Sonora, Tamaulipas, Yucatán and Zacatecas; the rest of the states are grouped under the name *other federative entities* (See Figure 1 in the Annex).

The series of the VAECMS are published by the INEGI and are presented by a monthly periodicity, covering the time period between January of 1990 until September of 2006 (the latest information available at the time this paper was written).

Regarding the quantitative methods used, it should be made clear that these methods constitute an indispensable face element to carry out an objective and rigorous conjunctural analysis. For this, it is precise to have adequate forecast models, by means of which we can not only project the variables towards the future, object of the study, but also by which we can detect in a correct and quick way which is the underlying evolution, understanding this as the adequate indication for the short and mid term evolution, from which we can extract the appropriate diagnostics.

In this research, the purpose is definitely to combine the available information based on experience and the quantitative methods in order to extract the main conclusions as well as the outlook for the short and mid term of the Mexican MIE, determining which is the tendency of these perspectives considering the latest available data. In order to do this, the following section begins by presenting some

background records for the maquila sector in Mexico; the third section presents the methodological proposal; the fourth section is centred in the methodology application with the objective of evaluating the conjunctural situation of the MIE, presenting the main results regarding the current situation and the short and medium term perspectives of the sector. This presentation ends in the fifth section with the main conclusions.

2. Outlook of the recent Mexican MIE evolution

Since the second half of the sixty's decade of the last century, the border states of northern Mexico have experienced an accelerated industrialization process, whose first impulse lies in the combination of policies of industrial and regional development that led to the installation of establishments classified as MIE manufacturers. Eventually, the development of the local infrastructure as well as the opening of industrial parks in the different border cities, made possible the establishment and participation of the first economic agents and investments readily available. In the eighty's, certain policies were adapted and introduced in the industrial sector which allowed the extension of maquila to the rest of the country. The economic and commercial opening processes of the last two decades, made the maquila a main industry activity, not only in the northern states geographically located at the border with the United States, but also in other states of Mexico (Díaz, 2003; Merchand, 2004; Mercier, 2005).

The expansion of the MIE from the border states toward the rest of the entities and geographical regions of Mexico, shows the importance and reach of the industrial policies applied in the north region in combination with the proper evolution of the national manufacturing industry and with the different phases of the the commercial opening process. This situation has redefined the strategy of growth favoring a major export orientation of production in an environment of intense competitiveness in international markets.

Even though the Mexican MIE has had a favorable evolution and performance since the second half of the eighty's decade and the ninety's decade, in recent years there has been concern regarding the loss of competitiveness of this industry and its relative vulnerability due

to the presence of changes in the economic cycle of the United States (Mejía, 2003). Particularly, the maquila activity experienced the closing of industries with a significant contraction in employment and in the value of production in the 2001-2003 time period.

Some studies have identified several external causes behind this decline. One of the explanations is the emergence of other markets with abundant and cheap manpower which explains in part the closing of some industries in Mexico and the reinstallment in other countries. In this matter, the increased presence of export products coming from China that have been displacing the exportable Mexican products, has been observed; another important factor has been the deceleration of growth in the United States, this brings on a negative effect in the maquila sector, given the integration level and, in consequence, the degree of dependence regarding the economy of northern neighbor. Other domestic factors that also explain part of the competitiveness loss of the Mexican industry, that have increased the production and distribution costs, are, for example, the infrastructure lack, the excess of regulations or bottle necks at customs (Carrillo and Gomis, 2003; Gerber and Carrillo, 2003; Vargas, 2003; López, 2004; Mercier, 2005).

The recent economic dynamics, within an intense global international competition and the incidence of exogenous shocks such as the deceleration of the growth and demand from the United States for Mexican products, have forced to modify the traditional outlines of production in the Mexican industry. Companies and their economic agents have been focused towards the consolidation of their position in the markets through certain mechanisms like productivity improvement, an improved efficiency in the assignment and use of production factors, technological change¹ and cost reduction. So, for example, there has been an introduction of adjustment in staff rolls. Particularly the Mexican MIE has focused its efforts towards the productive specialization gaining from special

¹ See for example, Mendoza and Calderón (2001), Mendoza (2002) and Ollivier (2005). In order to revise the concept of "environment" related to the forming of institutions, relations and communication networks among agents to provide support to the Mexican MIE, see Villavicencio and Casalet (2005).

advantages of location. It has adopted integration formats with other local and foreign companies that intervene in other phases of the productive processes. Furthermore, it is not at all rare to find in maquila establishments of northern Mexico as well as in other states and regions a certain sophistication in the implemented quality control systems such as the “just in time” practices. The creation of company groupings and regional clusters also stand out as well as advanced processes of industrial scaling (Almaraz, 1998; Carrillo and Hinojosa, 2001; Mendoza, 2001; Dussel, 2003).

Due to the changing conditions in which the maquila sector has developed in Mexico, it is crucial to question the importance of the Mexican MIE in the national added value and in the states where it is present. How have certain variables changed such as the export added value, the number of active industries, and employment, among others? What has happened in the main maquila states?

The MIE has had great relevance for Mexico; for example between 1990 and 2005 the real export added value has increased a yearly annual average of 9.2%; the numbers of active industries has grown 3.4% and the employment has been increased a 6.5% annual average during the same time period². Table 1 shows how the variables pointed out have evolved.

The information in Table 1 shows, for example, the favorable effect that the North American Free Trade Agreement (NAFTA) had on the MIE since the beginning of 1994; a certain decline is also noted in the growth of the sector starting 1999, which coincides with the deceleration of the economy in the United States. It is important to keep in mind that the Mexican IME is strongly related with the economy of the United States of America.

Between 2000 and 2004 the Mexican economy presents a clear stage of stagnation in the MIE. There were accumulated reductions not only in the number of industries, but also in employment, that is 23.8% and 18%, respectively; the export added value experienced negative real variations in 2002 and 2004. As mentioned before, some authors have associated this stagnation process with a decrease

² In 2005 the maquila industry gave employment to nearly one million, two hundred thousand people: 78.9% workers, 12.8% production technicians and 8.3% executive staff (INEGI).

in the competitiveness of the Mexican industry in the presence and emergence of other markets and the displacement of national exports due to the presence of Chinese products, among other domestic factors.

Table 1: General relevance of the maquila industry of exportation

Year	Added Export Maquila Value ^a (1)	Number of Establish Ments (2)	Remune rated Occupied Personal (3)	(4) (Δ%) (1)	(5) (Δ%) (2)	(6) (Δ%) (3)
1990	57,350	1,703	451,169			
1991	61,027	1,914	434,109	6.4	12.4	-3.8
1992	64,639	2,075	503,689	5.9	8.4	16.0
1993	70,163	2,114	526,351	8.5	1.9	4.5
1994	77,944	2,085	562,334	11.1	-1.4	6.8
1995	89,371	2,130	621,930	14.7	2.1	10.6
1996	99,372	2,411	748,262	11.2	13.2	20.3
1997	123,672	2,717	903,736	24.5	12.7	20.8
1998	149,710	2,983	1,014,023	21.1	9.8	12.2
1999	173,804	3,297	1,143,499	16.1	10.5	12.8
2000	195,454	3,590	1,291,498	12.5	8.9	12.9
2001	205,550	3,630	1,202,954	5.2	1.1	-6.9
2002	201,818	3,003	1,071,467	-1.8	-17.3	-10.9
2003	205,286	2,860	1,069,172	1.7	-4.8	-0.2
2004	204,981	2,810	1,115,456	-0.1	-1.7	4.3
2005	214,470	2,816	1,166,250	4.6	0.2	4.6

Note: ^a Millions of real pesos. Base december 2003=100. Source: INEGI.

Since 2005 a new expansion process in the MIE has appeared with seems to distinguish itself for being relatively weak in comparison with the one registered in the ninety's decade. This smaller growth could be related, greatly, to the absence of structural reforms capable of giving continuity to those implemented in previous years and

whose application would culminate the transformation process of the productive sectors of the country.³

On the other hand, between 1990 and 2005, the bordering states of northern Mexico such as Baja California, Baja California Sur, Coahuila, Chihuahua, Nuevo León, Sonora and Tamaulipas stand out for their participation in the real added value of export, the number of active industries and the employees rates, in relation to other entities. In this same time period, in ten Mexican states, the real added value of export has grown to an annual average superior to that of the annual national average of 9.2%; in the other extreme, there are two other entities in which the same average is negative as can be seen in Table 2. In this figure the participation of each state in the country's total real added value of export, is registered, as well as the number of active industries and the average number of employees, respectively.

From analysing the number of active industries it can be observed that in five states the average annual increasing rates during this period are superior to the one observed at a national level; in another state of the country, the growth is similar to the average registered in the national added value; in four more states the growth is positive but minor and, in the rest it is negative (see Table 2).

Another indicator that shows the relevance of the maquila sector is the Mexican states' employee average which has grown from an annual average of 6.6% between 1990 and 2005 at a national level. In Table 2 we can see that eight states presented annual averages of progression rhythms, superior to the annual national average, except in the Capital of the country (Distrito Federal) and the State of Mexico, where we notice a fall in this variable throughout this period.

³ Some international organizations have recommended Mexico the adoption of structural reforms that will allow Mexico to reach a more important economic growth, see World Bank (1998, 2001).

Table 2: Relevance of the maquila industry of exportation in the states

	Added Export Maquila Value		Number of Establishments		Occupied Personal	
	1990	2005	1990	2005	1990	2005
	% from national total					
National Total	100.0	100.0	100.0	100.0	100.0	100.0
Aguascalientes	0.0	1.2	0.0	1.4	0.0	1.4
Baja California	20.2	18.7	37.5	32.1	19.6	20.6
Coahuila	4.6	7.2	7.8	7.8	6.9	8.8
Chihuahua	35.1	23.6	18.3	14.4	36.7	24.6
Durango	0.7	1.7	2.8	1.6	1.4	1.9
Guanajuato	0.0	2.0	0.0	1.4	0.0	1.0
Jalisco	2.9	7.4	2.4	3.4	1.5	3.9
Distrito Federal	0.0	0.2	0.0	0.6	0.0	0.1
México (state)	0.0	0.7	0.0	0.9	0.0	0.2
Nuevo León	4.2	8.6	3.8	7.0	3.1	5.6
Puebla	0.0	1.8	0.0	2.6	0.0	2.1
San Luis Potosí	0.0	2.0	0.0	1.0	0.0	0.9
Sinaloa	0.0	0.2	0.0	0.3	0.0	0.4
Sonora	6.8	5.4	9.1	7.3	8.7	7.1
Tamaulipas	20.6	15.0	13.2	12.1	18.1	15.6
Yucatán	0.4	1.4	0.8	3.0	0.6	2.6
Zacatecas	0.0	0.3	0.0	0.4	0.0	0.6
Other Fed. Entities	4.4	2.7	4.4	2.8	3.2	2.6
	Mean annual growth rate during period 1990-2005 ^{a/}					
National Total	9.2		3.4		6.6	
Aguascalientes	6.5		-2.7		3.4	
Baja California	8.6		2.3		7.0	
Coahuila	12.5		3.4		8.3	
Chihuahua	6.3		1.8		3.8	
Durango	16.2		-0.1		8.7	
Guanajuato	16.2		-0.1		3.2	
Jalisco	16.3		5.8		13.6	
Distrito Federal	-2.8		-1.4		-11.6	
México	4.0		-7.0		-13.6	
Nuevo León	14.5		7.7		10.8	
Puebla	11.9		9.2		8.4	
San Luis Potosí	18.3		7.2		5.9	
Sinaloa	14.5		-2.0		24.4	
Sonora	7.5		1.9		5.1	

Tamaulipas	6.9	2.8	5.5
Yucatán	18.4	12.6	17.6
Zacatecas	9.5	-5.0	4.8
Other Fed. Entities	7.2	2.5	6.4

Notes: Other Fed. Entities = Other Federative Entities. a/ The period considered to states of Aguascalientes, Guanajuato and Puebla was 1997-2005; the period to Distrito Federal, México and Sinaloa was 1998-2005 and, the period to San Luis Potosí and Zacatecas was 1999-2005.

These numbers not only show the dynamism of the MIE in the national and local context but they also provide information on the expansion process of this industry towards other geographical locations, other than the bordering northern states of Mexico.⁴

Once this succinct revision of the recent evolution of the Mexican maquila, has been made, important matters arise regarding the current situation and the short and mid term perspectives of a sector of the Mexican economy. For this purpose, as mentioned in the introduction we propose the application of a quantitative methodology of conjunctural analysis and forecast which we will describe in the following section.

3. Methodological proposal for the analysis of the economic conjuncture

We mentioned in the introduction that the two basic elements necessary to elaborate any analysis of economic conjuncture are the empiric base and the quantitative methods. Regarding the first element we will begin by establishing that the information contained in the raw data that constitute the empiric base of this paper, should be cleaned in order to recuperate from this information the *signal* they contain, which defines the underlying evolution of these time series. Indeed, all time series present swings of little economic interest (the irregular and seasonal components) that should be

⁴ According to the INEGI 2004, the border states as Baja California, Baja California Sur, Coahuila, Chihuahua, Nuevo León, Sonora and Tamaulipas concentrated 82.8% of the total number of employees of the MIE, while the center states like Distrito Federal, Jalisco and the State of Mexico altogether summed 3.1% and 11.6% relapsed in the remaining states.

eliminated to detect the true *signal* contained in the data. Hence, the purpose is definitely to extract the trend-cycle signal of these series; however, in order for this signal to be as pure as possible we also have to correct the trading day and the Easter effect as well as the outliers.

Specifying the generating data process of each one of the time series under study, that is, identifying the underlying ARIMA process to each one of them, and extending the traditional Box-Jenkins methodology by means of the outliers treatment and the calendar effect, the different components of the time series can be isolated, retaining the trend-cycle component that will be the one that collects or picks up the *underlying evolution* of the analysed time series.

This quantitative focus will also us to forecast future values from the original time series and from the main component in such a way that the application of the adequate growth rates to the projected series will allow us to determine the *underlying growth*.

For the conjunctural analysis, along with the concepts of underlying evolution and underlying growth, another key concept is *inertia*, which refers to the future growth rate of the trend, that is, the expected mid term growth.

From the comparison between the underlying growths obtained with different sample periods, as well as the underlying growths with the inertia, we can extract the main conclusions concerning the short and mid term perspectives, of each one of the series, under analysis, of the VAECMS of the country total and each one of the considered states.

The stages of the applied methodology in this research are the following: (1) ARIMA time series model; (2) univariate treatment of the time series considering the calendar effect and the outliers; (3) trend-cycle signal extraction and (4) interpretation of the basic quantitative results for conjunctural situation evaluation. In this section we will briefly develop each one of these stages.

3.1. ARIMA series time model

We assume that the analysed time series are generated by an ARIMA (p,d,q)·ARIMA (P,D,Q)₁₂ process, that is defined:

$$\phi(L)\Phi(L^{12})(1-L)^d(1-L^{12})^D y_t = \theta(L)\Theta(L^{12})u_t \quad (3.1)$$

where y_t is the time series under analysis, L is the lag operator, accordingly $L^p x_t = x_{t-p}$, $\phi(L)$ and $\Phi(L^{12})$ are the polynomial operators for the regular and seasonal autoregressive components respectively, whose characteristic roots should be outside of the unit circle, and will be defined as:

$$\phi(L) = 1 - \phi_1 L - \phi_2 L^2 - \dots - \phi_p L^p; \quad \Phi(L^{12}) = 1 - \Phi_1 L^{12} - \Phi_2 L^{24} - \dots - \Phi_p L^{12p},$$

$\theta(L)$ and $\Theta(L^{12})$ are the moving average polynomial operators for the regular and seasonal components, respectively, with characteristic roots outside of the unit circle, and will be defined as:

$$\theta(L) = 1 - \theta_1 L - \theta_2 L^2 - \dots - \theta_q L^q; \quad \Theta(L^{12}) = 1 - \Theta_1 L^{12} - \Theta_2 L^{24} - \dots - \Theta_Q L^{12Q}$$

where u_t is white gaussian noise, that is $u_t \sim \text{NID}(0, \sigma_u^2)$.

The methodology that we will apply is the one developed by Box and Jenkins (see Box, Jenkins and Reinsel, 1994) that as is well known consists of the following four stages: (1) identification, (2) estimation, (3) diagnostic checking and (4) forecasting.

In the first stage, identification, the purpose is to identify which concrete model (3.1) is susceptible to have generated the time series y_t . The fundamental instruments used to identify the pattern are the sample autocorrelation function (sacf) and the sample partial autocorrelation function (spacf). Once we have identified the ARIMA model, we will proceed to estimate its parameters (the exact maximum likelihood method was used), to carry out the diagnostic checking (analysing the individual significance of the parameters and also, the acceptance of the fact that the errors are white noise) and, finally, to obtain point and interval forecasts for future values of the series.

3.2. Univariate time series analysis with calendar and outliers effects.

The univariate analysis of time series literally following the Box-Jenkins approach is frequently insufficient in the context of economic series because it avoids different distortions that can affect

the variables under analysis. If this fact is ignored it will provide a limited comprehension of the behaviour of the time series but it can also alter substantially the utilized instruments in the four stages described in the previous section. The main distortions are produced as a consequence of the existence of external effects that lead to outliers and of the variants of the different calendar effects. Hence, a rigorous univariate formal treatment of the time series must consider, therefore, the adequate analysis of outliers and also of calendar effects. We analyze this topic in the Annex to section 3.2.

The procedure followed in this paper in order to detect the outliers, specifying in consequence the ARIMA model with outliers underlying the time series analysed, has been the procedure developed by Hillmer, Bell and Tiao (1983) and Chen and Liu (1993a), which consists of the four stages indicated in the Annex.

The generic model that we will specify for a time series in which the calendar effect is significant and in which we have detected k outliers is the following:

$$y_t = \sum_{i=1}^7 \beta_i D_{it} + \alpha H(\tau, t) + \sum_{j=1}^k \omega_j V_j(L) I_{jt}^{t_{0j}} + \frac{\theta(L)\phi(L^{12})}{\phi(L)\phi(L^{12})(1-L)^d(1-L^{12})^p} u_t \quad (3.16)$$

3.3. Trend-Cycle Signal Extraction

All signal extractions (Maravall, 1989, 1990; Espasa and Cancelo, 1993) are based on the proper definition of an adequate filter (moving average) in order to highlight the interested signal (component) that has to be applied to the raw series. The forms adopted by each of these filters originate different alternative procedures for the signal extraction that can be classified in two main groups: the empiric based and the ones based on models.

In this paper we will use the signal extraction method based on reduced form models. The objective is, to extract the different components from the analysed series, according to the specification of the model-type written in (3.16).

It should be observed that the model (3.16) contains two very different parts. The first part is a stochastic component, that is the

ARIMA model; and the second part is a deterministic component that includes the effect of the outliers and also the calendar effects.

The signal extraction (components) will therefore, be carried out in two stages. In the first stage the purpose is to extract the signals from the stochastic component applying the reduced form method. Then in the second stage, the elements of the deterministic component will be distributed in the different components, previously identified.

In order to extract the signals from the stochastic component we have to obtain the proper filters to estimate the components, from the assumption that each one of them also models itself, like an ARIMA model. The method has an identification problem as a consequence of the fact that there are an infinite number of structures (decompositions of the components of the original series) that are also compatible with the ARIMA model, it also happens that for certain ARIMA models there does not exist a possible decomposition solution. So, in order to solve this identification problem, it is necessary to introduce an additional restriction, denominated canonical restriction.

For a more detailed explanation of the fundamental statement of this method, see Burman (1980), Hillmer and Tiao (1982), Bell and Hillmer (1984) and Maravall and Pierce (1986 and 1987) which is the following:

Given the y_t time series, under analysis, whose generator data process originates from the following:

$$\phi^*(L)y_t = \theta^*(L)u_t \quad (3.17)$$

where:

$$\begin{aligned} \phi^*(L) &= (1-L)^d (1-L^{12})^D \phi(L) \Phi(L^{12}); \\ \theta^*(L) &= \theta(L) \Theta(L^{12}) \end{aligned} \quad (3.18)$$

The polynomials roots $\phi^*(L)$ and $\theta^*(L)$ are assigned to each one of the following components – trend-cycle (T), seasonal (S) and irregular (I)- considering the component to which it theoretically corresponds. As a fact, supposedly the three components follow ARIMA processes, according to:

$$\phi_T(L)T_t = \theta_T(L)a_t; \quad a_t \sim NID(0, \sigma_a^2)$$

$$\phi_s(L)S_t = \theta_s(L)b_t; \quad b_t \sim NID(0, \sigma_b^2) \quad (3.19)$$

$$\phi_I(L)I_t = \theta_I(L)c_t; \quad c_t \sim NID(0, \sigma_c^2)$$

The autoregressive polynomials are related by means of the expression:

$$\phi(L) = \phi_T(L)\phi_s(L)\phi_I(L) \quad (3.20)$$

in such a way that the polynomials on the right side of the equation do not have common roots.

Furthermore, the restrictions impose themselves regarding the order of the polynomials $\theta_T(L)$ and $\theta_s(L)$ must not overcome the maximum order of the polynomials $\phi_T(L)$ and $\phi_s(L)$ respectively, as well as the canonical restriction that we referred to previously, that consists in maximizing the variance of the innovation of the irregular component (c_t), which means that the largest part of the variability is concentrated in this component.

Once calculated the values of the parameters of the expression (3.19), considering the restrictions we have pointed out, the next step is to try to approximate the values of the components that correspond to the time series under decomposition. Each one of these components will get close by minimizing the quadratic error between the real component and the referred approximation; therefore leading to the following theoretical filters for each one of the three components:

$$\begin{aligned} \text{T:} \quad & \frac{\sigma_a^2 \theta_T(L)\theta_T(F)\phi_s(L)\phi_s(F)\phi_I(L)\phi_I(F)}{\sigma_u^2 \theta(L)\phi(L)} \\ \text{S:} \quad & \frac{\sigma_b^2 \theta_s(L)\theta_s(F)\phi_T(L)\phi_T(F)\phi_I(L)\phi_I(F)}{\sigma_u^2 \theta(L)\phi(L)} \\ \text{I:} \quad & \frac{\sigma_c^2 \theta_I(L)\theta_I(F)\phi_T(L)\phi_T(F)\phi_s(L)\phi_s(F)}{\sigma_u^2 \theta(L)\phi(L)} \end{aligned} \quad (3.21)$$

where F is a forward operator, contrary to the lag operator L , that is defined as: $F = L^{-1}$.

Once we have carried out the signal extraction from the stochastic component of the model, the next step is to distribute the deterministic component of the model among the trend-cycle, seasonal and irregular components. Regarding the distributing process for the Trading days and the Easter effects, we have followed the method proposed by Hillmer, Bell and Tiao (1983). For the outliers it is important to distinguish the treatment for type AO, IO and TC with the LS. Regarding the first three, it is necessary to keep in mind that the effect that they have on the series is transitory (a unique moment in the case of the AO and a forward effect in the other two cases with a muffled effect until disappearing⁵) for this reason, these effects are assigned directly to the irregular component, which by definition is the one that collects the anomalies that modify the short term swings of the series. Regarding the Level Shift (LS) due to the fact that the effect produced on the time series is permanent, its effect has to be assigned totally on the trend, because it represents a change in its long term evolution.

3.4. Interpretation of the basic quantitative results for the evaluation of the conjunctural situation

The three basic concepts that allow us to constitute the quantitative analysis of economic conjuncture are: underlying evolution, underlying growth and inertia.

The underlying evolution of a time series defines the smooth and firm course of the time series once we have removed from the original data the oscillations that hinder the pursuit of the phenomena we are interested in. This course is the one we are interested in because it will allow us to evaluate the evolution of the phenomenon, since this phenomenon oscillates around it; hence its deviations are compensated. Precisely for this reason, within the underlying evolution certain basic characteristics of the phenomenon can be

⁵ The effect that the innovational outlier (IO) has on a series depends on the identified stochastic process; therefore, in those situations, when the effect becomes permanent, the treatment used will be analogous to the treatment used in the level shift (LS).

detected. As a matter of fact they could be perceived, but with great difficulty in the original time series.

In this paper the underlying evolution is identified in each one of the analysed time series as the trend-cycle component, which is obtained following the methodology described in the previous sections.

One of the fundamental components for all conjunctural analysis is the variation rhythm (growth rate) for the time series under analysis. Regarding this, and considering that the growth rates are annual and that they should be applied on the trend-cycle component of the series, and that it is convenient that they be in phase with the basic growths (inter monthly growths⁶), in this research we also define as underlying growth, the centred annual growth rate obtained from the underlying evolution of the series, which is obtained from their trend-cycle component, and is calculated with a forecast at the end of the sample. It is definitely about the growth rate T_{12}^1 which for the period t will be defined as follows:

$$T_{12}^1(t) = \frac{TC_{t+6} - TC_{t-6}}{TC_{t-6}} \quad (3.22)$$

where TC is the trend-cycle component of the series.

Along with the concepts of underlying evolution and underlying growth, another relevant concept for the conjunctural situation evaluation is inertia, which is defined as the mid term growth expectation for the time series.

From the three key concepts mentioned in the previous section- underlying evolution, underlying growth and inertia- we may design an evaluation strategy from the quantitative results contained in these concepts with the purpose of elaborating a precise diagnostics regarding the conjunctural situation of the Mexican MIE.

⁶ Defining as basic growth (m_1) the inter monthly rate, that expressed in a percentage of one to one is equal to: $(Y_t - Y_{t-1})/Y_{t-1}$, demonstrates that the rate T_{12}^1 is, approximately, a changeable sum of basic growth; that is, $T_{12}^1(t) \cong (1 + L + L^2 + L^3 + \dots + L^{11})m_1(t)$. The T_{12}^1 assigned at the end of the period is in a different phase regarding m_1 . In order to correct this the proposal is to centre the rate.

The five fundamental aspects used to carry out the pertinent diagnostics are the following:

(A) Description and evaluation of the underlying evolution

The purpose is to determine if the analysed variable is undergoing a situation of accelerated growth, deceleration or if it is constant, and in what growth rate it is advancing present time. This information will be obtained by analysing the underlying growth evolution.

(B) Analysis about the expectation of changes in the underlying evolution signal

Comparing the current situation of the underlying evolution with the expected mid term growth (inertia), we will conclude regarding the probability of a change in the direction of the underlying evolution situation, and if there is a change, the question is: what direction will it take?

(C) Evaluation of the improvement or worsening of the short term situation

The purpose is to compare the current underlying growth estimate for the period t with the one obtained from previous data base; concretely if the underlying growth that we obtain for any given series in the period corresponding the month of September 2006- considering as the informative base the all the information until this month- it is superior (inferior) to the underlying growth obtained for the same series and the same date – considering as the informative base all the information until the month of June of the same year, we will conclude that the short term perspectives for the time series under analysis have improved (become worse) in the short term.

(D) Evaluation of the mid term improvement or worsening situation

The purpose is to compare the inertia value obtained from an informative base constituted by all the information available at the time this research was carried out (September 2006) with the value obtained with a more reduced informative base (including information, for example, until June 2006). We will conclude that the possibility exists of a mid term improvement (worsening) considering that the current expectations of mid term growth are better (worse) than those obtained previously. In the case that they be analogous, we shall say that the mid term situation remains stagnant.

(E) Comparative analysis with the evolution of the time series at regional level

The purpose is to compare the different aspects mentioned in the previous paragraphs in the series that correspond to the national total with the ones obtained for the different Mexican states considered.

4. Evaluation of the conjunctural situation of the Mexican maquila industry based on quantitative results

The methodology described in the previous section has been applied to total national time VAECMS time series of seventeen Mexican states and to one other region that groups the other federative entities, object of this study. Regarding the first two steps, which consist in the univariate time series analysis with treatment of the calendar and outliers effects, the main results obtained are presented in Table 3.

Table 3: Models of the added value series of export charged for maquila services in the states

Serie	ARIMA Model	Ljung-Box	Jarque-Bera	Trading Day Effect	Easter Effect	Outliers ^{1/}
National Total	(1,1,0) (0,1,1)	20.27 (0, 33.90)	0.96 (0, 5.99)	Yes	No	
Aguas calientes	(0,1,1) (0,0,0)	31.04 (0, 35.20)	0.29 (0, 5.99)	No	No	TC Sep-1997 TC Apr-1996
Baja California	(1,1,0) (0,1,1)	27.26 (0, 33.90)	1.03 (0, 5.99)	Yes	No	TC Jan-2003 TC Feb-1999 AO Jan-1996 TC Jan-1995
Coahuila	(0,1,1) (0,1,1)	12.50 (0, 33.90)	1.46 (0, 5.99)	Yes	No	TC Mar-1999 TC Jan-1996 TC Jul-1994 AO Nov-1993 LS Jun-1993
Chihuahua	(0,1,1) (0,1,1)	24.75 (0, 33.90)	3.38 (0, 5.99)	Yes	No	

Durango	(0,1,1)	22.81	1.62	No	No	AO Feb-2002
	(0,1,1)	(0, 33.90)	(0, 5.99)			TC Oct-2001 LS May-2001 AO Nov-1996 AO Sep-1996
Guana juato	(0,1,1)	29.19	1.94	Yes	No	AO Nov-2000
	(0,0,0)	(0, 35.20)	(0, 5.99)			LS Oct-2000
Jalisco	(0,1,1)	21.18	0.01	No	No	TC Jan-2000
	(0,1,1)	(0, 35.20)	(0, 5.99)			AO Dec-1999 AO Aug-1999 AO Mar-1999 AO Dec-1992
D.F.	(0,1,1)	24.55	12.71	No	No	LS Aug-2003
	(0,0,0)	(0, 35.20)	(0, 5.99)			LS Jan-2001 AO Feb-1998 LS Dec-1997
México	(2,1,0)	17.51	1.87	No	No	LS Nov-2005
	(0,0,0)	(0, 33.90)	(0, 5.99)			
Nuevo León	(0,1,1)	20.10	2.65	No	No	TC Sep-1992
	(0,1,1)	(0, 33.90)	(0, 5.99)			LS Jun-1991
Puebla	(0,1,1)	25.62	1.26	No	Yes	TC May-1998
	(0,1,1)	(0, 33.90)	(0, 5.99)			
San Luis Potosí	(0,1,1)	27.59	0.04	No	No	LS Jun-2005
	(0,0,0)	(0, 35.20)	(0, 5.99)			TC Sep-2000 LS Oct-1999 LS Jul-1999
Sinaloa	(1,0,0)	30.64	0.28	Yes	No	LS Nov-2002
	(1,0,0)	(0, 33.90)	(0, 5.99)			AO May-2002 AO Apr-2001 TC Jun-1997

Sonora	(0,1,1)	39.77	1.75	Yes	No	AO Jan-2000
	(0,1,1)	(0,	(0, 5.99)			AO Apr-1999
		33.90)				TC Nov-1998
						LS Jul-1998
						LS Mar-1998
						LS Feb-1997
						AO Oct-1996
						AO Jun-1996
Tamauli pas	(0,1,1)	28.83	3.88	Yes	No	AO Apr-1993
	(0,1,1)	(0,	(0, 5.99)			AO Dec-1991
Yucatán	(0,1,1)	32.01	0.50	No	No	AO Aug-1999
	(0,1,1)	(0,	(0, 5.99)			AO Jun-1996
		33.90)				LS Jul-1995
						TC Jan-1995
						TC Jul-1992
						TC May-1991
Zacate cas	(0,1,1)	12.64	4.25	No	No	LS Jul-1990
	(0,1,1)	(0,	(0, 5.99)			LS May-2006
		35.20)				AO Nov-2005
Other Federati ve Entities	(0,1,1)	31.89	2.38	No	No	LS Aug-2003
	(0,1,1)	(0,	(0, 5.99)			LS Jan-1999
		33.90)				LS Apr-1996
						LS Jan-1996
						TC Sep-1990
						TC Apr-1990

1/ Type of outliers: *Aditive Outlier (AO)*, *Innovational Outlier (IO)*, *Level Shift (LS)* y *Temporary Change (TC)*.

It is important to observe that next to the ARIMA model, finally identified, for each time series, the value of the statistics, Ljung and Box (1978), is included, for the residuals autocorrelation analysis and Jarque and Bera (1987) for the normality. Next to these values we have added, in parenthesis, the limits that define, for a significance level of 5%, the acceptance region of each one of the

tests. Information is also included regarding if the trading day effect, outliers and Easter effect have been considered indicating the type and temporary period in which it has been detected.

In eight of the series the trading day effect, has been significant and in one series the Easter effect was significant; likewise, in seventeen of the nineteen considered time series, significant outliers have been found. These results reinforce the methodological strategy followed in this paper⁷.

Once the univariate time series analysis under study has been carried out, we have applied the signal extraction method stated in the previous section, with the purpose of eliminating the oscillating elements that are not relevant for the analysis of the underlying time series evolution.

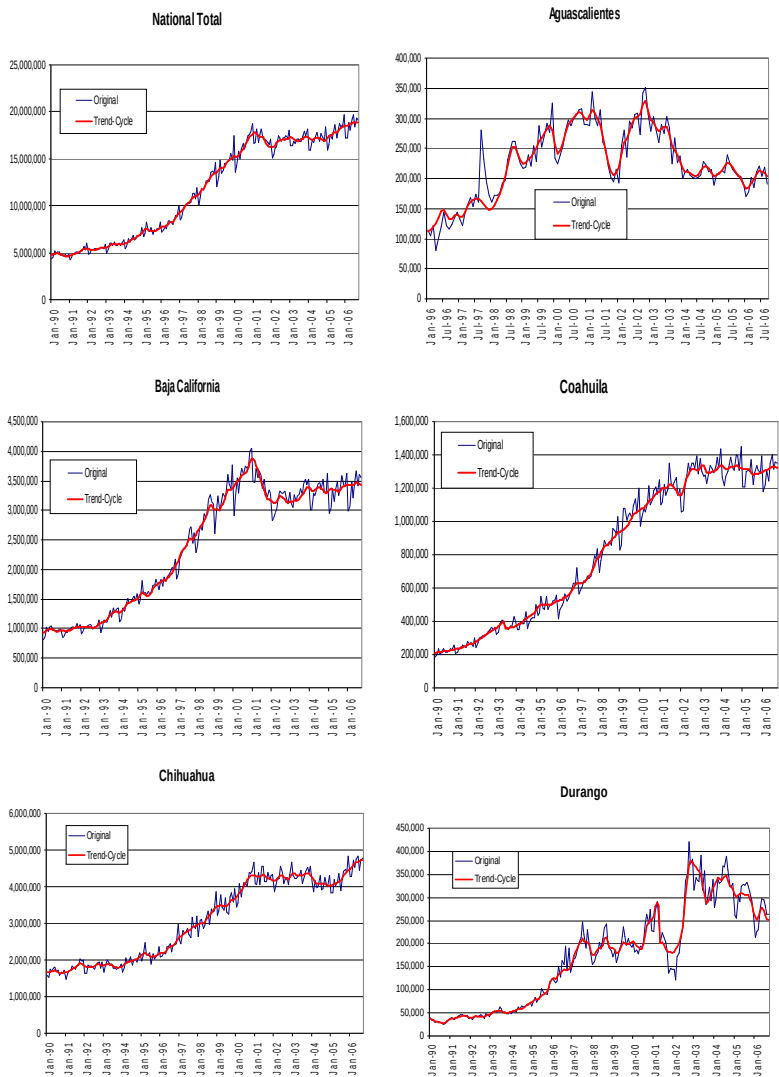
In the figures 2 and 3 the original series and the corresponding component tendency-cycle (underlying evolution) are represented for each one of them, which was obtained applying the signal extraction procedure based on the reduced form models, considering the whole available sample as an informative base, that we will indicate by means of I_T that in a general way consists of 201 observations ($T = 201$)⁸.

The first thing we can observe from figures 2 and 3, is the difference between the "real" evolution of the time series we used (the original data) and the evolution of the trend-cycle components, which tend to be more isolated since we have not included the seasonal component, nor the irregular component, nor calendar effects or outliers, that appear in the same evolutions, just as we have pointed out.

⁷ The authors have the detailed results and are available to any interested reader, regarding the parameters forecast, the significance analysis, graphics of residuals and of the sample and partial autocorrelations, from which the summary of results has been obtained and is attached in the Table 3.

⁸ For the time series of the states of Aguascalientes, Guanajuato and Puebla $I_T=129$; entities like Distrito Federal (Mexico City) and the State of Mexico and Sinaloa, correspond to $I_T=117$ and for San Luís Potosí and Zacatecas $I_T=93$.

Figure 2: Original series and trend-cycle component of the added value of export charged for maquila services from the national total, Aguascalientes, Baja California, Coahuila, Chihuahua, Durango, Guanajuato, Distrito Federal and State of México



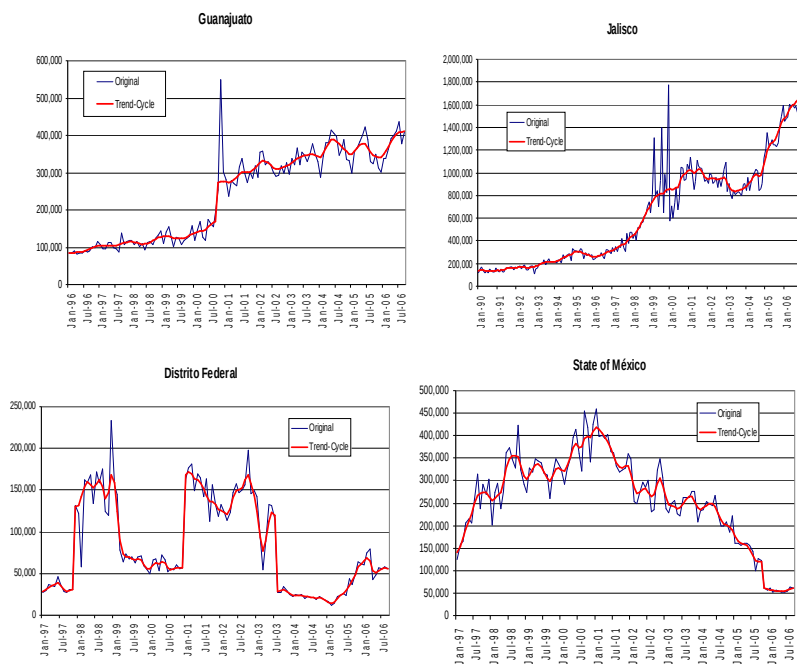
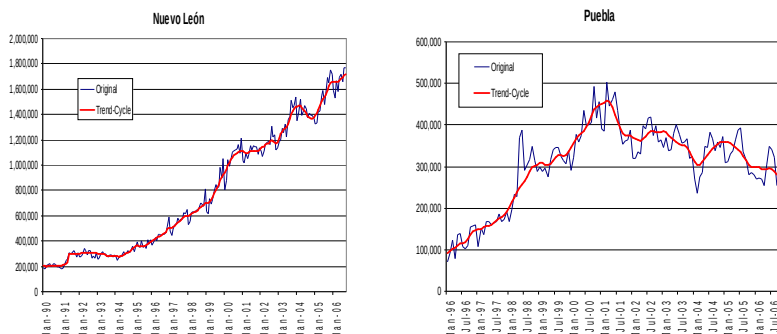
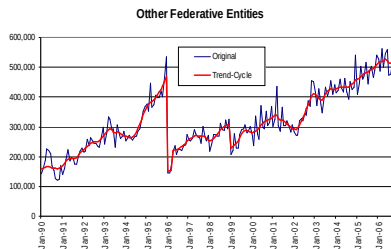
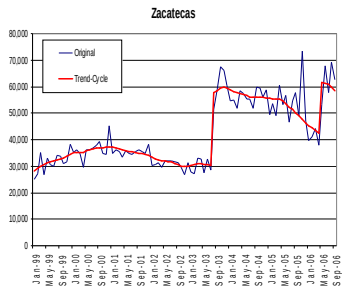
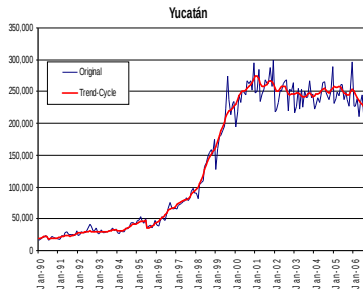
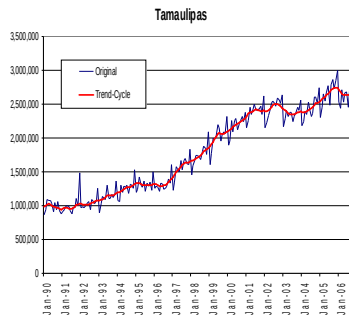
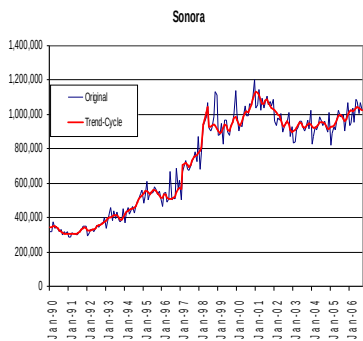
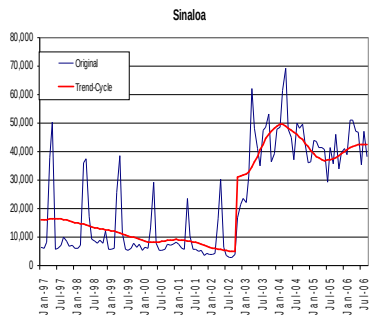
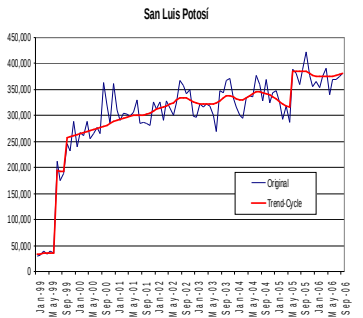


Figure 3: Original series and trend-cycle component of the added value of export charged for maquila services from the national total, Nuevo León, Puebla, San Luis Potosí, Sinaloa, Sonora, Tamaulipas, Yucatán, Zacatecas and Other Federative Entities





The analysis of the underlying evolution allows us to carry out a structural type evaluation, analysing the evolution of the economic cycle throughout the whole sample period. This way, if we focus on the VAECMS series for the national total (See the first graphic in Figure 2) it is possible to see a first period of sustained growth from January 1990, which was momentarily interrupted as a consequence of the denominated "december 1994 error". The effects of this economic crisis were manifested throughout all of the following year. Particularly, the added value in the Mexican export maquila industry had an erratic behaviour registering certain increases and decreases with a moderate magnitude during a few months to later recapture its growth from the end of 1995 until June of 2001. The commencement of the NAFTA (North American Free Trade Agreement) in January of 1994 reduced the negative results of the crash of December; at least, in the case of the maquila export industry.

The outstanding dynamism showed by the Mexican MIE throughout the ninety's decade, proves its relevance as a key component in the economic engagement and as a strategic sector in the national development. At the same time, it proves it is the result of the steps taken for a structural change and of the phases of commercial opening that gave a new format to the Mexican productive sector.

Between July and November of 2001 the time series show a recessive period that reflects the deceleration of the United States economy to which the Mexican maquila industry is closely related. In the following months and until the end of 2004, a period of stagnation is observed in the series. Several authors have associated this event with a competitiveness reduction in the Mexican industry. The last stage of the time series seems to head toward a new expansion process of the MIE; however, this growth is less consistent compared with the growth registered during the ninety's decade.

Applying centred growth rate T_{12}^1 expressed in (3.22) to the trend-cycle component of each series, that is to the underlying evolution, we obtain the underlying growths of the series, whose values from September of 2004 until the last month from which there is available information (September of 2006) are included in Table 4.

Notice that the referred rate of growth is applied to the values that define the underlying evolution obtained from an informative base I_T , just as the one obtained from the informative base resultant from excluding the last three observations, that is I_{T-3} .

Table 4: Recent underlying growth (%) of the added values series of export charged for maquila services

Period	National Total		Agua calientes		Baja California		Coahuila		Chihuahua	
	I_T	I_{T-3}	I_T	I_{T-3}	I_T	I_{T-3}	I_T	I_{T-3}	I_T	I_{T-3}
oct-04	3.2	3.3	2.4	2.4	-0.1	-0.1	-0.3	-0.3	0.3	0.4
nov-04	3.3	3.3	7.0	7.0	-0.6	-0.6	-1.4	-1.4	1.0	1.1
dec-04	3.1	3.1	10.7	10.7	-1.4	-1.3	-2.7	-2.6	1.4	1.4
jan-05	3.0	3.0	9.0	9.0	-2.0	-1.7	-3.4	-3.3	2.1	2.0
febr-05	4.0	4.0	2.7	2.7	-0.8	-0.7	-3.7	-3.6	3.5	3.4
mar-05	5.7	5.6	-3.6	-3.6	1.1	1.0	-3.9	-3.9	5.6	5.5
april-05	7.7	7.7	-6.3	-6.3	2.7	2.5	-3.5	-3.5	8.0	8.1
may-05	9.3	9.3	-7.1	-7.1	3.7	3.5	-2.6	-2.6	9.7	9.8
june-05	9.1	9.1	-8.6	-8.6	3.3	3.3	-1.9	-2.0	10.5	10.6
july-05	7.6	7.6	-10.1	-10.0	2.1	2.3	-1.2	-1.2	11.1	11.1
aug-05	6.4	6.4	-9.7	-9.7	1.7	1.9	-0.5	-0.5	11.6	11.6
sept-05	6.2	6.2	-8.3	-8.3	2.2	2.4	-0.4	-0.4	12.3	12.3
oct-05	6.1	6.2	-7.0	-6.9	2.5	2.7	0.0	0.0	13.1	13.1
nov-05	5.8	6.0	-5.7	-5.0	3.0	3.4	1.2	1.0	13.1	13.2
dec-05	6.1	6.5	-6.0	-3.3	4.3	5.3	2.7	2.3	12.8	12.8
jan-06	6.3	7.0	-5.8	-0.3	4.5	6.4	3.7	3.4	12.6	11.8
febr-06	5.5	6.7	-4.3	2.5	3.0	5.9	3.5	3.8	11.6	10.7
mar-06	4.0	5.9	-4.1	4.6	1.1	5.3	3.0	4.1	9.9	9.3
april-06	2.9	5.2	-4.0	6.9	0.4	5.2	3.1	4.4	8.2	8.1
may-06	2.5	4.8	-1.2	8.8	0.4	5.1	3.2	4.5	7.7	7.8
june-06	2.5	4.8	3.6	11.1	0.2	4.9	3.2	4.5	7.3	7.4
july-06	2.7	5.0	8.0	12.6	0.3	5.1	3.1	4.4	6.7	6.9
aug-06	3.2	5.6	6.9	12.2	0.5	5.5	3.1	4.4	6.2	6.3
sept-06	3.3	5.6	2.9	10.3	0.6	5.5	3.3	4.6	5.4	5.5
Inertia	2.9	5.3	-0.3	8.5	0.6	5.4	3.3	4.7	4.5	4.5

Period	Durango		Guana juato		Jalisco		Distrito Federal		State of México	
	I _T	I _{T-3}	I _T	I _{T-3}	I _T	I _{T-3}	I _T	I _{T-3}	I _T	I _{T-3}
oct-04	-9.6	-9.5	-1.5	-1.7	33.8	33.6	-15.2	-15.2	-35.9	-35.9
nov-04	-8.5	-8.4	-2.4	-2.5	31.9	32.1	5.1	5.1	-37.1	-37.1
dec-04	-9.7	-9.6	-2.8	-3.1	30.5	30.9	16.2	16.2	-39.0	-39.0
jan-05	-11.4	-11.5	-4.1	-3.6	30.9	31.3	34.6	34.6	-41.1	-41.1
febr-05	-11.7	-11.8	-5.8	-4.1	34.4	34.4	69.7	69.7	-42.2	-42.2
mar-05	-9.8	-9.9	-6.5	-4.3	40.3	39.6	100.0	100.0	-41.4	-41.4
april-05	-8.4	-8.5	-6.0	-4.1	44.4	43.1	135.5	135.5	-40.5	-40.5
may-05	-11.1	-11.1	-4.6	-3.6	43.1	41.9	193.1	193.1	-69.0	-69.0
june-05	-15.3	-15.3	-2.4	-2.9	36.8	36.4	246.9	246.9	-68.7	-68.7
july-05	-16.3	-16.3	-0.4	-2.1	29.5	30.0	313.0	313.0	-67.4	-67.4
aug-05	-16.2	-16.2	0.1	-1.4	25.0	25.9	384.6	384.5	-66.4	-66.4
sept-05	-15.4	-15.3	0.8	-0.6	24.1	25.0	312.8	312.7	-65.9	-65.9
oct-05	-11.7	-11.4	2.4	0.4	24.6	25.5	172.7	172.7	-66.0	-66.1
nov-05	-9.6	-8.8	4.2	1.3	24.8	26.0	116.7	116.5	-65.7	-66.0
dec-05	-11.3	-8.0	7.0	2.2	24.9	26.6	110.6	109.4	-63.4	-64.4
jan-06	-14.5	-6.3	11.1	1.2	24.4	25.9	91.6	87.2	-58.2	-60.9
febr-06	-17.4	-5.4	15.5	1.5	23.0	25.3	59.2	54.0	-52.1	-57.2
mar-06	-17.6	-4.2	18.7	1.9	20.7	23.2	35.5	31.9	-49.8	-56.1
april-06	-15.1	-1.3	17.8	2.1	16.7	20.1	13.3	11.4	-49.5	-56.0
may-06	-11.3	3.1	18.5	2.2	15.0	17.5	-4.0	-5.6	-1.2	-13.8
june-06	-5.7	9.7	17.9	2.1	14.7	16.4	-10.3	-11.8	1.8	-11.3
july-06	-0.1	16.2	15.8	1.8	15.2	16.5	-14.5	-15.9	5.1	-8.3
aug-06	2.4	19.1	12.9	1.5	15.3	16.7	-20.0	-21.3	8.3	-5.5
sept-06	0.2	16.5	9.4	1.2	14.3	16.4	-14.2	-15.6	10.0	-4.1
Inertia	-4.6	10.9	5.6	0.7	13.3	15.8	3.6	1.9	11.4	-2.7

Period	Nuevo León		Puebla		San Luís Potosí		Sinaloa		Sonora	
	I _T	I _{T-3}	I _T	I _{T-3}	I _T	I _{T-3}	I _T	I _{T-3}	I _T	I _{T-3}
oct-04	1.3	1.3	12.6	12.3	-4.6	-1.2	-23.0	-22.9	2.1	2.1
nov-04	4.6	4.6	8.2	8.5	-6.4	-0.7	-23.0	-22.6	3.2	3.2
dec-04	6.7	6.7	4.5	4.7	12.6	2.0	-22.3	-21.7	4.0	4.1
jan-05	8.8	8.8	-0.2	0.0	11.5	4.1	-20.8	-20.2	4.6	4.7
febr-05	12.4	12.4	-5.3	-5.0	11.2	6.3	-19.0	-18.6	4.2	4.1
mar-05	16.2	16.1	-9.9	-9.4	11.7	9.3	-16.9	-16.6	2.4	2.4

april-05	18.9	18.9	-13.8	-13.3	12.2	11.0	-13.9	-13.7	2.5	2.4
may-05	20.8	20.7	-16.4	-15.8	12.3	10.7	-9.7	-9.7	5.8	5.8
june-05	21.0	21.0	-17.2	-16.7	12.3	9.8	-5.5	-5.7	9.0	9.0
july-05	19.3	19.3	-16.8	-16.2	13.0	10.2	-0.9	-1.2	9.9	9.9
aug-05	17.2	17.2	-16.9	-16.1	14.6	12.5	4.0	3.5	9.8	9.8
sept-05	15.2	15.3	-17.5	-17.0	16.5	14.7	8.2	7.5	9.3	9.4
oct-05	13.1	13.2	-16.9	-17.3	17.7	14.1	11.0	10.1	7.9	8.0
nov-05	11.3	11.5	-15.2	-16.1	18.4	9.8	13.6	12.4	6.4	6.7
dec-05	10.6	11.0	-13.5	-14.5	-2.5	4.3	15.0	13.6	5.1	6.1
jan-06	10.4	10.8	-12.1	-13.9	-1.9	0.3	15.1	12.5	3.9	5.2
febr-06	9.5	9.8	-11.3	-12.8	-1.3	-1.9	14.7	12.7	4.1	6.6
mar-06	7.9	8.3	-11.0	-11.3	-1.0	-3.9	13.8	12.3	5.7	9.3
april-06	6.3	7.0	-10.6	-10.2	-2.2	-4.7	11.0	11.3	6.5	11.1
may-06	5.4	6.2	-10.7	-10.5	-1.5	-3.5	9.3	9.8	5.4	9.9
june-06	5.6	6.4	-12.1	-11.7	-0.6	-1.7	7.7	8.3	2.9	7.3
july-06	6.6	7.4	-14.0	-13.6	0.0	-0.8	5.9	6.6	1.0	5.5
aug-06	7.7	8.5	-15.3	-14.9	0.3	-0.7	4.3	5.1	0.7	5.3
sept-06	8.5	9.3	-15.9	-15.4	0.2	-1.2	3.1	3.9	1.2	6.0
Inertia	9.0	9.8	-17.1	-16.1	0.2	-1.1	2.3	3.2	1.1	5.9

Period	Tamaulipas		Yucatán		Zacatecas		Other Federative Entities	
	I _T	I _{T-3}	I _T	I _{T-3}	I _T	I _{T-3}	I _T	I _{T-3}
oct-04	8.9	9.0	3.7	3.8	-3.9	-3.5	9.2	9.2
nov-04	9.1	9.1	2.3	2.3	-4.4	-3.2	10.3	10.3
dec-04	9.6	9.6	-0.7	-0.7	-5.6	-3.1	11.0	11.0
jan-05	10.1	10.1	-2.7	-2.7	-6.9	-2.8	11.8	11.8
febr-05	10.1	10.1	-2.4	-2.5	-8.1	-2.3	12.7	12.7
mar-05	9.7	9.7	-1.8	-1.9	-10.0	-1.8	12.5	12.4
april-05	9.3	9.3	-1.5	-1.5	-12.7	-1.1	11.6	11.7
may-05	9.2	9.2	-0.9	-0.9	-15.0	-0.1	11.1	11.1
june-05	8.4	8.4	-1.0	-1.0	-16.9	0.6	11.4	11.6
july-05	6.5	6.5	-2.5	-2.4	-18.5	1.4	12.5	12.7
aug-05	4.2	4.2	-4.4	-4.3	-19.8	2.0	12.2	12.7
sept-05	2.4	2.5	-6.6	-6.4	-21.3	2.4	11.2	12.1
oct-05	1.1	1.2	-8.7	-8.2	-23.0	3.0	10.7	12.2
nov-05	0.0	0.2	-9.2	-8.2	12.7	4.6	10.0	12.8
dec-05	-1.0	-0.7	-8.7	-6.2	14.6	6.4	8.4	13.6
jan-06	-1.7	-0.9	-8.6	-3.0	16.3	4.6	6.3	14.0

febr-06	-2.5	-1.5	-9.0	-1.4	16.8	4.2	4.9	14.4
mar-06	-3.2	-1.9	-9.3	-0.4	16.6	3.6	4.8	14.8
april-06	-2.8	-1.9	-8.9	-0.3	21.8	3.0	5.2	15.4
may-06	-2.6	-1.7	-10.4	-2.0	24.2	2.5	5.1	15.3
june-06	-1.9	-1.0	-11.6	-3.3	26.2	2.5	4.3	14.4
july-06	-0.6	0.2	-10.7	-2.3	27.8	2.4	3.7	13.7
aug-06	1.1	1.9	-8.7	0.0	29.0	2.2	4.3	14.1
sept-06	2.6	3.3	-6.3	2.7	30.3	2.0	5.2	14.8
Inertia	3.7	4.3	-4.3	4.8	31.8	1.3	5.7	14.6

In the last row of this table we have also included the value of the inertia, for each series and for each informative base considered, that is obtained projecting to a medium-term forecast (in this case with a forecast lead time equal to 12 months) the underlying growths derived from the future values of the series that can be obtained from the models that we have carried out.

In figures 4 and 5, in the Annex, we present the graphic representations of the underlying growth obtained.

From the information included in Table 4 and figures 4 and 5, we can elaborate the diagnostic for the conjunctural situation of the Mexican MIE, according to the information referred to in section 3.4, in which we have established the evaluation strategy for the obtained quantitative results.

According to aspect (A) referred to in section 3.4, the description and valuation of the underlying evolution, the main conclusion that we extract is that the representative time series for national total of the VAECMS for the Mexican MIE is now in a period of moderate growth, although since January of the present year a certain deceleration is observed; indeed the underlying inter annual growth rate in September of 2006 is situated in 3.3%, that is 3 percentage points below the recent maximum reached in January of the present year (6.3%).

As far as aspect (B), that is if it is probable to expect any significant change in the underlying evolution signal, we can conclude that it is probable that this moderate growth will maintain itself or, decay even more, due to the inertia of 2.9% is 0.4% below the current underlying growth.

The evaluation of the improvement or worsening of the short term

situation, aspect (C) reveals that the latest available data to consider and, that corresponds to the informative base until September 2006 has worsened the short term situation of the Mexican maquila industry, just as can be seen in Table 4 and in Figure 4, the evolution of the underlying growth has diminished with regards to the values obtained with an informative base that included data until June of 2006.

Finally, regarding the situation evaluation of mid term improvement or worsening, aspect (D), this is carried out by comparing the values of the inertia for the two considered informative bases. In this context we can conclude that the latest available data has clearly worsened the mid term growth expectations since the value of the obtained inertia with the most recent informative base (2.9%) clearly worsens its value (5.3%) calculated, considering only the information included until June of 2006.

Just as we pointed out in section 3.4, the conjunctural analysis carried out for the national total of the Mexican MIE is substantially enriched if we extend the referred analysis to the main Mexican maquila states. It is because of this, that in this research we have considered not only the added series, but also the series that refer to seventeen federative entities and one other region that contains other states as stated in section 1. For each one of the time series we have applied the evaluation approaches and criteria described in the proposed methodology, obtaining, therefore the conclusions that are attached in Table 5. Furthermore, from these analysis we are able to apply the aspect (E) stated in section 3.4, which consists in carrying out the comparative analysis of the conjunctural analysis for each sub sector with the total added value.

From the information contained in Table 5 in the Annex, it can be observed that the current situation and the short and mid term outlook and perspectives of the Mexican maquila industry are very different, when the diverse geographical areas in which this activity takes place, are considered.

Beginning with the analysis of the underlying evolution it is important to highlight that only 3 of the considered states (Distrito Federal -Mexico City- the capital-, Puebla and Yucatán) are unmarked from the positive evolution detected at national level in reference to the underlying growth referred to the month of

September. Their negative growths are, indeed, very important: -6.3% referred to Yucatán, -14.2% referred to the Distrito Federal (Mexico City) and -15.9% concerning to Puebla. The other 14 states considered present positive underlying growths in September of 2006, although it is important to emphasize that there is a wide range among these growths. They oscillate, between the almost unnoticeable swing in San Luis Potosí and Durango (0.2%) and the spectacular growth in Zacatecas with 30.3%. It is also important to highlight in this aspect, referring to the current situation of the Mexican maquila industry, concretely, to the underlying growth observed in the last month from which there is information available (September of 2006), there are 7 states that present results that are above the country's national total; we are referring to, they are organized in order of their growth from the least to the greatest: Other federative entities (5.2%), Chihuahua (5.4%), Nuevo León (8.5%), Guanajuato (9.4%), the State of Mexico (10%), Jalisco (14.3%) and Zacatecas (30.3%).

This tendency of these growth rates to worsen in the next months, proven at a national level (it is the result of a value of the inertia, less than that of underlying growths calculated for the latest available information in the sample) is also observed in 8 states: Aguascalientes, Chihuahua, Durango, Guanajuato, Jalisco, Puebla, Sinaloa and Sonora. In 3 states the situation seems to be stable with a coincident current underlying growth with the value of the inertia, these are: Baja California, Coahuila and San Luis Potosí. The 7 remaining states (Distrito Federal, State of Mexico, Nuevo León, Tamaulipas, Yucatán, Zacatecas and Other federative entities) show a tendency toward the improvement in the growth rates of the VAECMS.

At national level we detected that the situation in the short and mid term had a tendency to worsen, according to the analysis that emerges from comparing the results from all of the available sample information with the most optimistic, obtained previously (concretely, considering the available information, three months before). This worsening is also observed at a regional level in 10 of the states (Aguascalientes, Baja California, Durango, Jalisco, Puebla, Nuevo León, Sinaloa, Sonora, Tamaulipas, Yucatán and other federative entities). Five states, however, are unmarked from this

tendency for which the short and mid term perspectives seem to be positive; we are talking about: Distrito Federal, Guanajuato, the State of Mexico, San Luis Potosí and Zacatecas.

The information provided in this research allows us to carry out a deeper analysis regarding the current situation and the short and mid term perspectives of the maquila industry in Mexico. This is due to the fact that, in order to understand this situation better, and to make a precise diagnostic, analysing the changes of the tendency toward its worsening or improvement, is not sufficient. It is also necessary to analyse the absolute growths, from which these tendencies move about, as well as the proper dimensions of the analysed industry for each state. In this aspect, the spectacular growth observed, for example, in Zacatecas (30.3%) with an improvement trend is very outstanding, especially if we consider the importance of maquila this state was practically nonexistent in 1990 and currently the manpower occupied, for example, represents alone a 0.6% of the country's total in this activity.

In any case, from this research it is possible to extract conclusions regarding the performance of the states regarding their activities in the maquila industry. We will refer to the states as "winners" and "losers" referring to their individual performance. Within the first group, we shall include those that present high current growth rates (superior to the country average of 3.3%) and that also present an improvement trend both in the short and mid term. In this group the following states are included: Zacatecas, State of Mexico and Guanajuato. In the group "losers," that is to say the states that present current growth rates inferior to the country average and whose outlook in the short and mid term is negative, the states are: Aguascalientes, Baja California, Durango, Puebla, Sinaloa, Sonora, Tamaulipas and Yucatán. We should also include in this group, "Distrito Federal" (Mexico City), because although it seems that the short and mid term perspectives have a tendency to improve, it is also true that this tendency emerges especially as a consequence of starting off from a very elevated negative growth rate (-14,2% in September 2006).

A particularly interesting matter stands out from this information, and that is that three of the four states with the greatest importance in the maquila industry (Baja California, Sonora and Tamaulipas) are in

the group denominated as “loser” group. This and other indicators that are easily appreciated from the information provided in this study should be an object of attention on behalf of the government’s industrial policy, with the purpose of strengthening, at a national and regional level, an industry, this is, the export maquila industry which is so relevant for the industrial engagement, and hence the Mexican economy.

5. Conclusions

From the understanding that the quantitative economic conjunctural analysis is one of the essential instruments to design economic policy, in this article we have proposed the application of a quantitative methodological focus for the economic conjunctural analysis based on four stages – ARIMA model, outliers analysis and trading day effect, the trend-cycle extraction and the analysis and interpretation of the basic quantitative results – with this information it is possible to complement the essential aspects of any conjunctural analysis, this is: an appropriate evaluation and quantification of the past and present situation of the economic reality object of this analysis and quality forecasts regarding the future evolution of this reality and a proper diagnostic based on the results of the two previous items.

This complete method has been applied to the time series of the added income value charged for maquila services within this Mexican export industry, referred to the country’s total as well as to the seventeen most important states for this industry of the country, plus one more region that include the rest of the federative entities. Therefore, the purpose is to carry out a regional conjunctural analysis of the maquila sector in Mexico.

The main conclusions that are essential to extract from this analysis are the following: in the first place, that the Mexican maquila export industry is currently going through a period of moderate growth. During the past eight months the growth has been clipped in three percentage points in the export added value of the total national. In our analysis what stands out is: that both in the short and mid term, there is certain tendency towards the reduction of the growth rate which points to a stagnation in the evolution in the Mexican export maquila industry.

These results must not be generalized to all of the states; as a matter of fact, the recent favourable evolution of the income added value for the Mexican export maquila industry in the country's total is explained mainly to the favourable performance of the states of Zacatecas, Jalisco, State of Mexico, Guanajuato, Nuevo León and Chihuahua and also the performance of the region in which the other federative entities are included. In these regions the underlying growth in September of 2006 is superior to that registered as the national total. A second group of states shows positive underlying growths but below the corresponding national total; in this situation the entities include: Sinaloa, Aguascalientes, Tamaulipas, Sonora, Baja California, Durango and San Luis Potosí. For some of the entities mentioned already (Zacatecas, State of Mexico and Guanajuato) we have an optimistic outlook both in the short and mid term. As mentioned before, the considered districts in this research are not far from the most recent conjunctural evolution in the Mexican maquila export industry, which has been experimenting a certain deceleration in its growth rates since the highest value reached at the beginning of 2006.

In the other extreme, the situation is much worse, particularly in Puebla, Distrito Federal (Mexico City) and Yucatán where a negative growth has been registered in September 2006. It seems this performance will continue in the following months, which is what the short and mid term diagnostic reveals, negative, in the case of the states of Puebla and Yucatán; on the other hand, for the Distrito Federal (Mexico City) a certain improvement is anticipated in the next months. It is also especially negative the fact that three of the regions (Baja California, Sonora and Tamaulipas) present lower growths in regards to the country average, as well as negative perspectives in the short and mid term.

These are only a few conclusions that can be extracted from the provided material in this research. Extensions of this analysis are definitely existent, considering the detailed analysis of each state of the republic, also including municipalities. We could also extend the number of variables that may be analysed. The purpose is to approximate a convincing understanding of the Mexican situation the clearest way possible for a conjunctural analysis of the Mexican

economy. Both extensions constitute research lines to follow in future research papers.

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Annex on line

Annex to section 3.2

Beginning with the outliers that may appear in the time series, their detection is essential, because like Chen, Liu and Hudak (1990) point out, an adequate treatment can improve, also the understanding of the time series under analysis and, therefore, of the proper comprehension of its evolution:

(a) The forecast and model in which unknown external events may alter the structure of the statistics habitually used in the identification stage (see Chan, 1995 and Trivez and Nievas, 1996, 1998, 2003), and even though an appropriate identification of the process of the underlying evolution of the time series is performed, the forecast of the parameters are to be considered.

(b) The intervention analysis, since we use an intervention model we have to be sure that the effects of the interventions that we specify are not contaminated by outliers.

(c) The quality of forecasts, because we must keep in mind that depending on the time and the nature of the external event that originates the outlier, this can seriously affect the quality of the forecasts that are obtained from the identified model. For more details see Hillmer (1984), Ledolter (1989) and Trivez (1994, 1995). In the literature (Hillmer, Bell and Tiao, 1983; Chen, Liu and Hudak, 1990; Chen and Tiao, 1990; Chen and Liu, 1993a, 1993b) there have been considered four different types of outliers: the Additive Outlier (AO), the Innovational Outlier (IO), the Level Shift (LS) and the Temporary Change (TC).

Denoting y_t as the observed time series and for z_t the series free of outliers, which will generically be defined according to (3.1), that is:

$$z_t = \frac{\theta(L)\Theta(L^{12})}{\phi(L)\Phi(L^{12})(1-L)^d(1-L^{12})^D} u_t \quad (3.2)$$

we can define each one of the four outliers mentioned as the following expressions.

An additive outlier (AO) is an event that affects a time series for one time period only. If we assume that an outlier occurs at time $t = t_0$, we can represent the series we observe by the model:

$$y_t = z_t + \omega I_t^{t_0} \quad (3.3)$$

where:

$$I_t^{t_0} = \begin{cases} 1, & \text{si } t = t_0 \\ 0, & \text{si } t \neq t_0 \end{cases} \quad (3.4)$$

is the variable that represents the presence or absence of the outlier in the corresponding period t_0 and ω is the outlier effect.

An innovational outlier (IO) is an event whose effect is propagated according to the ARIMA model of the process. In this manner, an IO affects all values observed after its occurrence. The model for the observed series is:

$$y_t = z_t + \omega \frac{\theta(L)\Theta(L^{12})}{\phi(L)\Phi(L^{12})(1-L)^d(1-L^{12})^D} I_t^{t_0} \quad (3.5)$$

where $I_t^{t_0}$ is the same variable defined in (3.4).

We define the Level Shift (LS) as the event that affects a time series at a given time, whose effect becomes permanent. The model for the series we observe may be represented by:

$$y_t = z_t + \omega \frac{1}{(1-L)} I_t^{t_0} = z_t + \omega S_t^{t_0} \quad (3.6)$$

where $I_t^{t_0}$ is defined as in (3.4) and $S_t^{t_0} = \frac{1}{(1-L)} I_t^{t_0}$ is a step variable that is defined as:

$$S_t^{t_0} = \begin{cases} 1, & \text{si } t \geq t_0 \\ 0, & \text{si } t < t_0 \end{cases} \quad (3.7)$$

Finally, we will define the temporary change (TC) as that event that has an initial impact on the time series and whose effect decays exponentially according to some dampening factor, say δ , with $0 < \delta < 1$. In consequence, we can represent the observed series as:

$$y_t = z_t + \omega \frac{1}{(1-\delta L)} I_t^{t_0} \quad (3.8)$$

The procedure followed in this paper in order to detect the outliers, specifying in consequence the ARIMA model with outliers underlying the time series analysed, has been the procedure developed by Hillmer, Bell and Tiao (1983) and Chen and Liu (1993a), which consists of the following stages:

STAGE 1: model of the time series assuming there are no outliers and estimate obtaining the series residuals of the model.

STAGE 2: For each observation it is supposed that there is an outlier AO ($i = 1$), IO ($i = 2$), LS ($i = 3$) and TC ($i = 4$), estimating the effect of this outlier and its standard error, so we obtain $\tilde{\omega}_i(t)$ and $SE[\hat{\omega}_i(t)]$ for $i = 1, 2, 3, 4$ and $\forall t$, calculating the followings statistics:

$$\lambda_{i,t} = \frac{\hat{\omega}_i(t)}{SE[\hat{\omega}_i(t)]}, \text{ for } i = 1, 2, 3, 4 \text{ and } \forall t \quad (3.9)$$

STAGE 3: Defining:

$$\tilde{\lambda}_{t_0} = \max_t \max_i \{|\tilde{\lambda}_{i,t}|\} \quad (3.10)$$

(a) If $\tilde{\lambda}_{t_0} < C$, where C is the critical value of the test⁹, then we will accept the null hypothesis that there is not an outlier at all, and, in consequence, we will specify the identified ARIMA model without outliers, in stage 1.

(b) If $\tilde{\lambda}_{t_0} > C$ we will conclude that in the t_0 period there is an outlier depending on its type, and if the maximum value of the statistics (3.9) in the referred period then it corresponds to an AO, IO, LS or TC.

⁹ The statistic (3.9) follows an unknown distribution, for this reason, in order to determine the critical value Chang, Tiao and Chen (1988) carried out different simulation exercises, from which they arrived to the conclusion that, in dependence of the available sample size, C should take an understood value between 3 and 4.5. The most common value and this is the value that we have adopted, it is $C = 3.5$.

STAGE 4: Given the case (b) in stage 3, that the purpose is to obtain a new transformed series in which the estimated effect of the detected outlier is eliminated in t_0 , proceeding then to calculate again the statistics of the expression (3.9). Stages 2 to 4 will be repeated until all the outliers are identified, this means, until we find in some iteration the case that corresponds to (a) of stage 3.

Assuming that the process concludes with the detection of k outliers, the specification of the appropriate model will be:

$$y_t = \sum_{j=1}^k \omega_j V_j(L) I_{jt}^{t_{0j}} + z_t \quad (3.11)$$

where z_t is defined as in the expression (3.2), ω_j is the j -outlier effect ($j = 1, 2, \dots, k$) and $V_j(L)$ is a delay polynomial that is defined, according to the outlier type that comes about, as:

$$V_j(L) = \begin{cases} 1, & \text{if the } j\text{-outlier is AO} \\ \frac{\theta(L)\theta(L^{12})}{\phi(L)\phi(L^{12})(1-L)^d(1-L^{12})^D}, & \text{if the } j\text{-outlier is IO} \\ \frac{1}{1-L}, & \text{if the } j\text{-outlier is LS} \\ \frac{1}{1-\delta L}, & \text{if the } j\text{-outlier is TC} \end{cases} \quad (3.12)$$

As we just said at the beginning of this section, besides the outliers time series can be altered as a consequence of the changes that are produced each year in the calendar. This is true, when we work, especially with monthly time series (like the series considered in this research) and flow variables (where the monthly values can be thought of as accumulation of daily values) it is obvious that the value of the time series will affect the composition of the calendar of every month and therefore the number of weekly labour days, this will vary (the number day corresponding to Monday, Tuesday etc.,). It can also affect certain dates that also vary such as the week of

Easter. All of these circumstances are denoted as calendar effect, and its treatment is convenient (to quantify and to eliminate its effects) in the univariate time series analysis, not only to improve the comprehension of the time series but also because they can lead to, as occurred with the outliers, to adulterate the different stages of the Box-Jenkins methodology.

Let us see how we can introduce each one of these referred calendar effects in the univariate time series analysis.

(1) Trading-Day Effect

Following Cleveland and Grupe (1983) and Hillmer, Bell and Tiao (1983), we can begin by adjusting the calendar effect in the month t :

$$DS_t = \gamma_1 X_{1t} + \gamma_2 X_{2t} + \dots + \gamma_7 X_{7t} \quad (3.13)$$

where X_{it} is the number corresponding to Monday ($i = 1$), Tuesdays ($i = 2$), ..., Sundays ($i = 7$) in the month t , and γ_i is the effect of a day type i under the variable of interest. .

The models (3.13) can be written as:

$$DS_t = \beta_1 D_{1t} + \beta_2 D_{2t} + \dots + \beta_7 D_{7t} \quad (3.14)$$

where:

$$D_{it} = (X_{it} - X_{7t}), \quad i = 1, 2, \dots, 6; \quad D_{7t} = \sum_{i=1}^7 X_{it};$$

$$\beta_i = (\gamma_i - \bar{\gamma}), \quad i = 1, 2, \dots, 6; \quad \beta_7 = \bar{\gamma}.$$

The parameterization (3.14) is more convenient than (3.13) because estimates of the γ_i 's tend to be highly correlated while estimates of the β_i 's are less correlated.

(2) Easter Effect

The main characteristic of the Easter holiday is that each year the calendar date changes, for this reason artificial variables should be designed in order to reflect in every year the effect that this has on the time series under study in the months of March and April. In order to model the Easter effect two simplified hypotheses are made: (a) to assume a fixed time period for Easter equal to τ days, and (b) to suppose that the incidence under the time series is the same one during the whole fixed period.

Considering these assumptions, the expression that we will consider is:

$$E_t = \alpha H(\tau, t) \quad (3.15)$$

where $H(\tau, t)$ is the number of days with Easter effect prior to Easter Sunday that is dated in the month t .

The generic model that we will specify for a time series in which the calendar effect is significant and in which we have detected k outliers is the following:

$$y_t = \sum_{i=1}^7 \beta_i D_{it} + \alpha H(\tau, t) + \sum_{j=1}^k \omega_j V_j(L) I_{jt}^{f_{oj}} + \frac{\theta(L)\theta(L^{12})}{\theta(L)\theta(L^{12})(1-L)^d(1-L^{12})^p} u_t \quad (3.16)$$

Annex of Tables and Figures

Table 5-1: Diagnostics of the conjunctural situation of the Mexican maquila export industry; Description and Current situation

	Description and valuation of the underlying evolution	Current situation of the underlying evolution and expected mid-term growth
Total National	In May 2005 the series grew at a rate of 9.3% it currently grows at a rate of 3.3%.	It is probable that the deceleration continues the inertia (2.9%) is less than the underlying evolution (3.3%).
Ags	In July 2006 the series grew at a rate of 8% it currently grows at a rate of 2.9%.	A margin exists so that the deceleration continues the inertia (-0.3%) is less than the current underlying growth
BC	In January 2006 the series grew at a rate of 4.5% it currently grows at a rate of 0.6%.	A continued constant growth is expected the inertia (0.6%) is equal to the current underlying growth (0.6%).
Coah	In January 2006 the series grew at a rate of 3.7% it currently grows at a rate of 3.3%.	A continued constant growth is expected the inertia (3.3%) is equal to the current underlying growth (3.3%).
Chih	In December 2005 the series grew at a rate of 12.8% it	A margin exists so that the deceleration continues the

	currently grows at a rate of 5.4%.	inertia (4.5%) is less than the current underlying growth (5.4%).
Dgo	In August 2006 the series grew at a rate of 2.4% it currently grows at a rate of 0.2%.	A margin exists so that the deceleration continues the inertia (-4.6%) is less than the current underlying growth (0.2%).
Gua	In March 2006 the series reached a growth rate of 18.7% it currently grows at a rate of 9.4%.	A margin exists so that the deceleration continues the inertia (5.6%) is less than the current underlying growth (9.4%).
Jal	In April 2005 the series grew at a rate of 44.4% it currently grows at a rate of 14.3%.	A margin exists so that the deceleration continues the inertia (13.3%) is less than the current underlying growth (14.3%).
DF	The series has observed a decrease since September 2005 it currently grows at a negative rate of -14.2%.	A margin exists so that the acceleration continues the inertia (3.6%) is greater than the current underlying growth (-14.2%).
Méx	The series shows an increasing underlying evolution but with negative rates since June 2005, it currently grows at a rate of 10%.	A margin exists so that the acceleration continues the inertia (11.4%) is greater than the current underlying growth (10%).
NL	In June 2005 the series reached a growth rate of 21% it currently grows at a rate of 8.5%.	A margin exists so that the acceleration continues the inertia (9%) is greater than the current underlying growth (8.5%).
Pue	In April 2006 the series reached a growth rate of -10.6% it currently grows at a rate of -15.9%.	A margin exists so that the deceleration continues the inertia (-17.1%) is less than the current underlying growth (-15.9%).
SLP	In November 2005 the series reached a growth rate of	A continued constant growth is expected the inertia (0.2%)

	18.4% it currently grows at a rate of 0.2%.	is equal to the current underling growth (0.2%).
Sin	In January 2006 the series reached a growth rate of 15.1% it currently grows at a rate of 3.1%.	A margin exists so that the deceleration continues the inertia (2.3%) is less than the current underlying growth (3.1%).
Son	In July 2006 the series reached a growth rate of 9.9% it currently grows at a rate of 1.2%.	A margin exists so that the deceleration continues the inertia (1.1%) is less than the current underlying growth (1.2%).
Tamps	The series shows an increasing underlying evolution since May 2006 it currently grows at a rate of 2.6%.	A margin exists so that the acceleration continues the inertia (3.7%) is greater than the current underlying growth (2.6%).
Yuc	The series has observed negative growth rates since December 2004 it currently grows at a rate of -6.3%.	A margin exists so that the acceleration continues the inertia (-4.3%) is greater than the current underlying growth (-6.3%).
Zac	The series presents an increasing underlying evolution since November 2005 it currently grows at a rate of 30.3%.	A margin exists so that the acceleration continues the inertia (31.8%) is greater than the current underlying growth (30.3%).
OFE	In February 2005, the series reached an increasing underlying growth rate of 12.7% it currently grows at a rate of 5.2%.	A margin exists so that the acceleration continues the inertia (5.7%) is greater than the current underlying growth (5.2%).

Table 5-2: Diagnostics of the conjunctural situation of the Mexican maquila export industry: Evaluation of the improvement and Comparison.

	Evaluation of the improvement or worsening of the short term situation	Evaluation of the improvement or worsening of the mid- term situation	Comparison of the underlying growth evolution national total and of each state
Total National	The evolution of the underlying growth is worse than expected (3.3%) in regards to an informative base delayed a trimester (5.6%).	Growth rates less (inertia of 2.9%) than expected, in regards to an informative base delayed a trimester (inertia of 5.3%).	
Ags	The evolution of the underlying growth is worse than expected (2.9%) in regards to an informative base delayed a trimester (10.3%).	Growth rates less (inertia of -0.3%) than expected, in regards to an informative base delayed a trimester (inertia of 8.3%).	Alternate series with a behaviour against the business cycle.
BC	The evolution of the underlying growth is worse than expected (0.6%) in regards to an informative base delayed a trimester (5.5%).	Growth rates less (inertia of 0.6%) than expected, in regards to an informative base delayed a trimester (inertia of 5.4%).	The series of the national total is above the series in Baja California and they both follow the same path.
Coah	The evolution of the underlying growth is worse than expected (3.3%) in regards to an informative base delayed a trimester (4.6%).	Growth rates less (inertia of 3.3%) than expected, in regards to an informative base delayed a trimester (inertia of 4.7%).	Alternate series with a behaviour relatively against the business cycle.

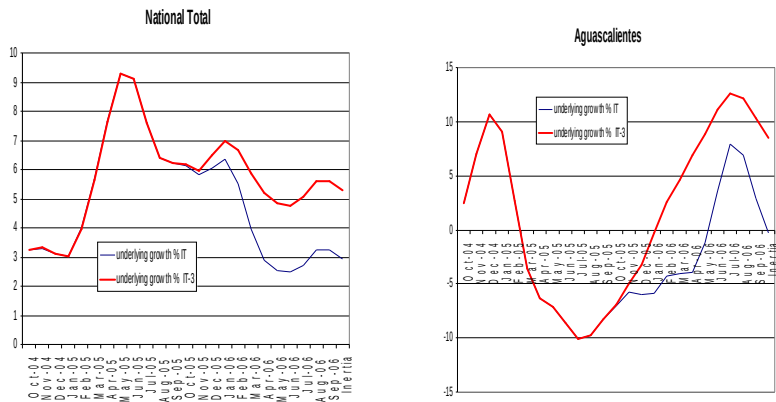
Chih	The evolution of the underlying growth is worse than expected (5.4%) in regards to an informative base delayed a trimester (5.5%).	Growth rates equal (inertia of 4.5%) to those expected, in regards to an informative base delayed a trimester (inertia of 4.5%).	The series of the national total and of the state of Chihuahua have alternate paths.
Dgo	The evolution of the underlying growth is worse than expected (0.2%) in regards to an informative base delayed a trimester (16.5%).	Growth rates less (inertia of -4.6%) than expected in regards to an informative base delayed a trimester (inertia of 10.9%).	The series of the national total is above the series that corresponds to Durango they both have different paths.
Gua	The evolution of the underlying growth is better than expected (9.4%) in regards to an informative base delayed a trimester (1.2%).	Growth rates better (inertia of 5.6%) than expected in regards to an informative base delayed a trimester (inertia of 0.7%).	Alternate series with a behaviour against the business cycle.
Jal	The evolution of the underlying growth is worse than expected (14.3%) in regards to an informative base delayed a trimester (16.4%).	Growth rates less (inertia of 13.3%) than expected in regards to an informative base delayed a trimester (inertia of 15.8%).	The series of the state of Jalisco is above the national total they both follow similar paths.
DF	The evolution of the underlying growth is better than expected (-14.2 %) in regards to an informative base delayed a trimester (-15.6 %).	Growth rates better (inertia of 3.6%) than expected in regards to an informative base delayed a trimester (inertia of 1.9%).	Alternate series with a different behaviour.
Méx	The evolution of the	Growth rates better	Alternate

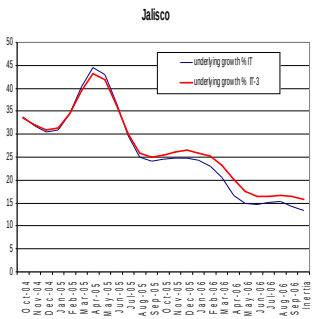
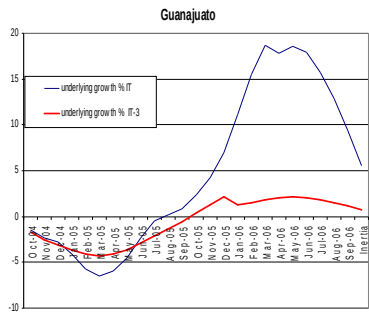
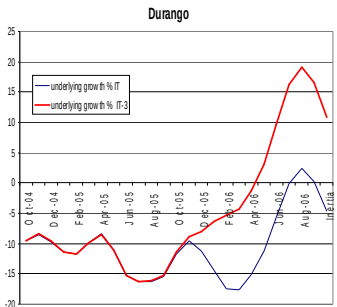
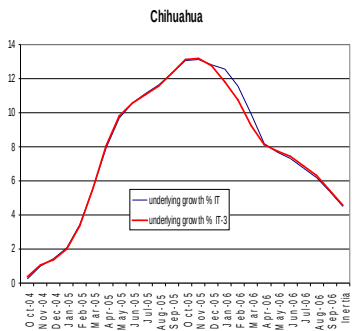
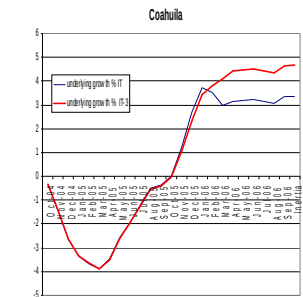
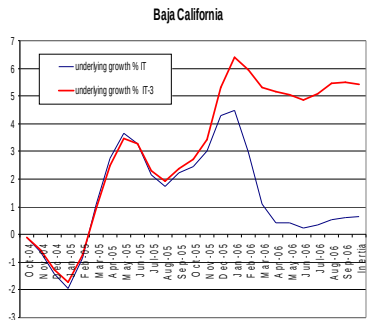
	underlying growth is better than expected (10%) in regards to an informative base delayed a trimester (-4.1%).	(inertia of 11.4%) than expected in regards to an informative base delayed a trimester (inertia of -2.7%).	series with a different behaviour.
NL	The evolution of the underlying growth is worse than expected (8.5%) in regards to an informative base delayed a trimester (9.3%).	Growth rates less (inertia of 9%) than expected in regards to an informative base delayed a trimester (inertia of 9.8%).	The series of Nuevo León is above the national total they both follow similar paths.
Pue	The evolution of the underlying growth is worse than expected (-15.9%) in regards to an informative base delayed a trimester (-15.4%).	Growth rates less (inertia of -17.1%) than expected in regards to an informative base delayed a trimester (inertia of -16.1%).	Alternate series with a behaviour against the business cycle.
SLP	The evolution of the underlying growth is better than expected (0.2%) in regards to an informative base delayed a trimester (1.2%).	Growth rates less (inertia of 0.2%) than expected in regards to an informative base delayed a trimester (inertia of -1.1%).	Alternate series with a different paths.
Sin	The evolution of the underlying growth is worse than expected (3.1%) in regards to an informative base delayed a trimester (3.9%).	Growth rates less (inertia of 2.3%) than expected in regards to an informative base delayed a trimester (inertia of 3.2%).	Alternate series with a different paths.
Son	The evolution of the underlying growth is worse than expected (1.2%) in regards to an informative base delayed a trimester	Growth rates less (inertia of 1.1%) than expected in regards to an informative base delayed a trimester	The series of the national total and Sonora have similar and alternate

	(6%).	(inertia of 5.9%).	paths the second is in favor of the business cycle with a slight tilt in its phase.
Tamps	The evolution of the underlying growth is worse than expected (2.6%) in regards to an informative base delayed a trimester (3.3%).	Growth rates less (inertia of 3.7%) than expected in regards to an informative base delayed a trimester (inertia of 4.3%).	The series of the national total and the series that corresponds to Tamaulipas follow different and alternate paths.
Yuc	The evolution of the underlying growth is worse than expected (-6.3%) in regards to an informative base delayed a trimester (2.7%).	Growth rates less (inertia of -4.3%) than expected in regards to an informative base delayed a trimester (inertia of 4.8%).	Since November 2004 the series of the national total is above the series that corresponds to Yucatán.
Zac	The evolution of the underlying growth is better than expected (30.3%) in regards to an informative base delayed a trimester (2.0%).	Growth rates better (inertia of 31.8%) than expected in regards to an informative base delayed a trimester (inertia of 1.3%).	Alternate series with a different paths.
OFE	The evolution of the underlying growth is worse than expected (5.2%) in regards to an informative base delayed a trimester (14.8%).	Growth rates less (inertia of 5.7%) than expected in regards to an informative base delayed a trimester (inertia of 14.6%).	Series with alternate paths and a behaviour against the business cycle.

Figure 1: Map of the Mexican States

Figure 4: Underlying growth of the VAECSM of the National Total, Aguascalientes, Baja California, Coahuila, Chihuahua, Durango, Guanajuato, Distrito Federal and State of Mexico





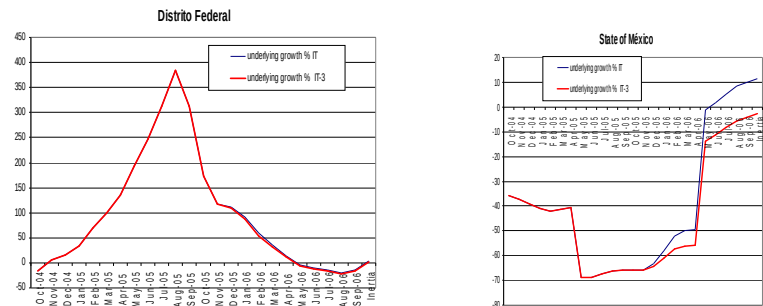


Figure 5: Underlying growth of the VAECSM of the National Total, Nuevo León, Puebla, San Luis Potosí, Sinaloa, Sonora, Tamaulipas, Yucatán, Zacatecas and Other Federative Entities

