EMPLOYMENT, WAGES AND ECONOMIC DEVELOPMENT IN MEXICO AND THE UNITED STATES, 1965-2015: IMPACT OF INDUSTRY AND THE EFFECTS OF NAFTA,

GUISAN, Maria-Carmen[*]
AGUAYO, Eva

Abstract
We present a comparison economic development, productivity, wages and employment in Mexico and the United States, for a period of 50 years (1965-2015). Accordingly to Kaldor´s contributions and the empirical evidence we think that it is very important, for to improve industrial development. Mexico experienced an average increase, of industrial real value-added per capita, around 15 USD per year (at constant prices of year 2000) both before NAFTA (period 1964-1993) and after NAFTA (for the period 1994-2012). The U.S. experienced higher increases: 75 USD per year in the first period and 39 per year in the second one. We estimate two macro-econometric equations, for both countries, showing the positive impact of industry on non industrial production and employment. Our conclusion, on the evolution of Mexico after NAFTA. is that it had some positive effects but not enough to get an important and sustained increase of industry, income per capita and wages in this country. Regarding the U.S. NAFTA has had also some positive effects, and the economy has evolved with important and sustained increase of economic development, income per capita and wages, both before and after NAFTA. Our recommendation is to increase cooperation between both countries in order to foster economic development, increasing industrial development.
Keywords: Economic Development, Macroeconometric equations of Employment, Mexico and the United States, Effects of NAFTA, Industrial Development.
JEL Codes: C5, E2, E24, J23, L6, O5, O51, O54

1. Introduction

We analyze the evolution of employment and development in Mexico and the United States for a period of 50 years: 1965-2015, and the important impact of industry.

Section 2 presents a revision of the literature and includes a reference to some relevant studies related with the effects of NAFTA on the economic development of their country members. Section 3.1 analyzes the evolution of the rates of employment per one thousand people, for the period 1985-2015 in NAFTA countries. We notice that the USA and Canada present rates of employment in Services much higher than Mexico which is mainly due to the positive impact industry. In section 3.2, we compare the evolution of industrial and non-industrial production, foreign trade and development in Mexico and the USA, while in section 3.3 we analyze the evolution of productivity and wages. Section 3.3 analyses the differences in productivity and real wages, showing that, in order to achieve a higher degree of convergence of Mexico with the United States, is necessary to increase industrial production per head in Mexico. In section 4 we present the estimation of some econometric models that show the positive impact of industry, on development and employment, in both countries. Section 5 presents the main conclusions. We include and Annex.

---

[*] Maria-Carmen Guisan, Professor Ad Honorem, and Eva Aguayo, Associate Professor of Econometrics, Faculty of Economics and Business Administration, University of Santiago de Compostela, Spain. E-mails: mcarmen.guisan@usc.es, eva.aguayo@usc.es.

2. Revision of the literature

In Guisan, Malacon and Exposito(2003) we analyzed the effects of NAFTA on Mexico, for the period 1994-2002, and we stated:

"After some years of hope in the effects of economic integration into NAFTA the results of the first period after the integration, 1994-2002, show several positive impacts on the Mexican economy, although economic policies in Mexico should also address other questions to solve problems that need some complementary economic policies, because economic integration is a help but not the only factor to have into account for improving economic development".

Forteen years later we confirm this view. Although NAFTA has had some positive effects in Mexico, as well as in the United States and Canada, the question for economic development of Mexico is that the degree of industrialization has evolved positively but too much slowly. Integration into NAFTA is not enough to guarantee a quick development of Mexico, and other supplementary economic policies are needed.

Regarding the effects of the integration into the North American Free Trade Agreement (NAFTA), those authors said that survey of the literature on integration into NAFTA shows a general positive evaluation although in same cases lower than expected, and cited the studies by Hanson (2003), on the impact on wages, Wall(2002) on foreign trade, Fukao, Okubo and Stern(2002) analysed the diversification of trade in some sectors. Chen and Martinez-Vazquez(2001) analized the impact on taxes and proposed an adaptation to improve exports of goods and services. Gruben(2001) suggests that fluctuation in the trade between USA and Mexico are explained mainly by other factors although NAFTA has a part in the explanation. Ianchovichina, Nicita and Soloaga(2001) analyse the effect of NAFTA in income distribution, by means of the Gini coefficient and other measures, and find increases of income in all the deciles of population. Dussel(2002) analyses the evolution of employment, productivity and foreign trade in Mexico since 1988 and found that in spite of some important increases of production, the results are below the expectations regarding economic development and employment.

We agree with many points of those interesting studies, particularly with Dussel(2002) regarding the need to improve industrialization in Mexico in order to foster some degree of convergence to the levels of the United States.

Scott(2014) shows concern for the increase of trade deficit in the United States, and says:

"Between 1993 and 2013, the US trade deficit with Mexico and Canada increased from $17.0 to $177.2 billion, displacing 851 700 US jobs. All of the net jobs displaced were due to growing trade deficits with Mexico. The number of US jobs displaced by trade deficits with Canada declined slightly between 1993 and 2013".

We must have into account also other positive effects of the integration for the United States. In this study we will see that the U.S. has experienced   a positive balance in employment, wages and productivity after the creation of NAFTA.

Weisbrot, Lefebre and Sammut(2014) consider that Mexico could have got higher standards of real wages and income per capita, with a diminution of poverty if NAFTA would had been successful in restoring higher rates of growth.

Blecker, Robert A. & Esquivel, Gerardo (2010) analyze the expectations and the realities about the economic impact of NAFTA on Mexico in terms of economic convergence, trade, investment, employment, wages, and income distribution. They show that NAFTA has basically failed to fulfill the promise of closing the Mexico-U.S. development gap.

Shahabuddin(2011) says that "*the effect of NAFTA on the USA is unclear, i.e. it does not show a negative or positive effect on the US economy. Specifically, it is hard to establish a direct relationship on the employment rate or wage rate in the USA due to NAFTA. Therefore, more study is needed to determine whether the USA has lost jobs or lowered the wage rate in the USA*"

Unger(2007) states that NAFTA has not benefited substantially economic growth nor opportunities for employment in Mexico, contrary to expectations.

Orrenius, Zavodny, Cañas and Coronado(2010) analyze the impact of remittances on economic development of Mexican states.

Our conclusion after the analysis of data and literature on the evolution of Mexico after NAFTA is that it had some positive effects but not enough to get an important and sustained increase of economic development, income per capita and wages in this country. This study shows the great importance that a higher level of industrialization would have to guarantee development and employment. Regarding the U.S. NAFTA has had also some positive effects, and the economy has evolved with important and sustained increase of economic development, income per capita and wages.

Gandolfi, Halliday and Robertson(2014) analyze the Wage convergence of Mexico with the United States for the period 1988-2011. Thy apply a panel approach and find no evidence of long-run wage convergence among cohorts with low migration propensities. They find some evidence of convergence for workers with high migration propensities.

3. Industry, development and employment in NAFTA countries

Section 3.1 presents a comparison of the evolution of employment in four sectors (Agriculture, Industry, Building and Services) and real value-added per inhabit ant in two sectors (Manufacturing and Non-Manufacturing), in NAFTA countries, for the period 1985-2015.

In section 3.2, we compare the evolution of industrial and non-industrial production, foreign trade and development in Mexico and the USA, while in section 3.3 we analyze the evolution of productivity and wages. and in section 4 we present the estimation of some econometric models that show the positive impact of industry on development and employment in both countries

3.1. Rates of employment by sector in México, USA and Canada, 1985-2015

Tables 3 to 6 show the evolution of the rates of employment per one thousand people for the period 1985-2015. Se notice that the USA and Canada present rates of employment in Services much higher than Mexico which is mainly due to the positive impact of the highest levels of industrialization and development in USA and Canada.

Table 3. Rates of Employment in Agriculture: North America, 1985-2015
(number of employed persons per one thousand inhabitants)

Country	1985	1995	2005	2015
Canada	22	19	14	8
Mexico	102	84	59	57
USA	14	13	11	8

Note: Agriculture includes farm activities, fisheries and forestry.
Source: Elaboration from OECD LFS and other sources.

Table 4. Rates of Employment in Industry and Construction: North America, 1985-2015
(number of employed persons per one thousand inhabitants)

Country	1985	1995	2005	2015
Canada	115	100	112	98
Mexico	84	79	100	106
USA	126	113	95	88

Note: Industry and Construction includes Building, Manufacturing and Energy.
Source: Elaboration from OECD LFS and other sources.

Table 5. Rates of Employment in Services: North America, 1985-2015
(number of employed per one thousand inhabitants)

Country	1985	1995	2005	2015
Canada	311	337	380	404
Mexico	146	206	247	266
USA	309	343	371	378

Source: Elaboration from OECD LFS and other sources.

Table 6. Total rates of employment: North America, 1985-2015
(per one thousand inhabitants)

Country	1985	1995	2005	2015
Canada	451	457	507	510
Mexico	347	358	396	429
USA	456	474	482	474

Source: Updated from Guisan (2006). Elaboration based on OECD statistics and other sources. Provisional estimations in some cases.

Table 7 shows the evolution of Manufacturing (QMH) and non manufacturing (QNMH) real value added per head in NAFTA countries for the period 2010-2015.

Table 7. Manufacturing (QMH) and Non-Manufacturing (QNMH) real value-added per head in North America, 2010-2015. (USD per head at 2011 prices and Purchasing Power Parities)

	QMH 2010	QMH 2015	QNMH 2010	QNMH 2015	PH 2010	PH 2015
Canada	4503	4625	36197	38358	40699	42983
Mexico	2682	3126	12853	13542	15535	16668
United States	6145	6477	43228	46313	49373	52790

Note: PH=QMH+QNMH). Source: Elaborated by Guisan(2017) from WB(2017) Statistics, except for Canada (elaboration using data from OECD(2017).

We may notice a positive evolution of QMH and QNMH in the three countries, we may also notice that QNMH generally increases with QMH.

As seen in several studies as Guisan(2013) there is a strong empirical evidence favourable to Kaldor´s perspective: industry is usually very important to foster non industrial development (particularly in Services sectors) and to guarantee improvements in productivity, real wages and rates of employment.

3.2 Industrial Real valued Added and Exports per head In Mexico and the U.S., 1965-2012.

Graphs 1 and 2 present the evolution of real value added of industry (QHI) and non-industrial sectors (QHNI) in Mexico and the USA, expressed in thousand Dollars per capita at 2000 prices and exchange rates.

In the case of the USA we notice an increase of QHNI in the period 2005-2012 in spite of the diminution of QHI. This was due to the effects of foreign trade as we will show in the econometric models of the next section.

In graph 1, we may notice a positive evolution of QHI in Mexico, for the period 1965-1981, almost stagnation for the period 1982-1995, and a trend to increase after 1995. There was a positive impact of NAFTA on QHI but not enough to speed the convergence of real income per head of Mexico with more developed countries. We may notice that the percentage of Mexico, with respect to the value of this variable in the United States is only around 22%.

In graph 4 we may notice that exports per head of Mexico have increased since year 1995 as consequence of a positive evolution of industry. There was also an important increase in the exports per head of the USA. The values of the United States are much higher than those of Mexico mainly due to higher levels of industrial development.

Graph 1. QHI and QHNI: Mexico   Graph 2. QHI and QHNI: United States
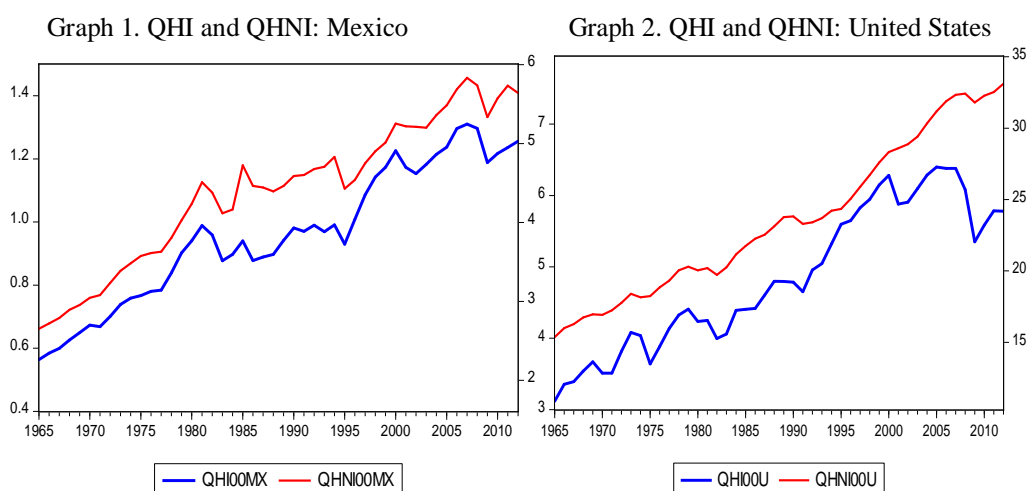
Source: Elaborated by authors from OECD statistics. Values in thousand USD at 2000 prices and Exchange Rates. Dual graph: left axis for QHI and right axis for QHNI.

Graph 3 shows the evolution foreign trade (real Exports and Imports per head (USD at 2000 prices and exchange rates) in Mexico and the United States.

Graph 3. Exports per head in Mexico and USA, 1965-2012.
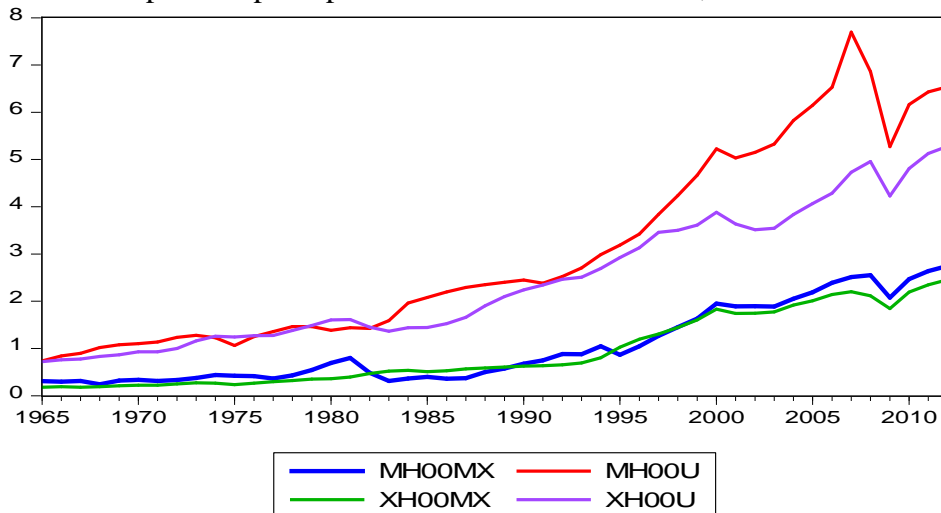
Source. Elaborated by authors from OECD statistics.

In the period 1995-2007 there was an increasing deficit in foreign trade per capita in the United States, with Imports increasing much more than Exports, but we must not blame to the effect of NAFTA nor to Mexican economy. The increase of imports and exports per capita in Mexico has been much more moderated than in the U.S.

We suggest to have into account the macro-econometric relationships of supply and demand published in Guisan(2011) and(2013), which among other factors (human capital. physical capital, social capital and other ones) emphasize the important role of industry and foreign trade (when there is a sustainable evolution of Exports and Imports) to increase real-value added and employment in services.

Figure 1 in Guisan (2009) presents an interesting summary of direction of causality between industry, foreign trade, non industrial production and employment. Foreing trade has several direct and indirect impacts on economic development, with a final result positive if it is sustainable, as to say when the deficit is small or supported by secure investments or relationships.

From a supply point of view, production of Services, and other non-industrial activities, depends positively on the availability of industrial products in the domestic market and thus QHI amd MH are expected to have a direct positive impact, while XH may have a direct negative impact on QHNI. Besides XH may have an indirect positive impact, because Exports increase capacity to Import and, from the demand side, have a positive e impact on QHI. Both effects of Exports on Imports and QHI usually have a positive impact on QHNI.

3.3. Employment, productivity and wages in Mexico and the U.S., 1965-2015

Mexico has experienced a positive evolution of the degree of convergence with the United States in the rate of employment but not enough in productivity and real wages.

Graph 5 presents the evolution of the rates of employment in Mexico and the USA while graph 6 shows the evolution of real productivity and real wage. Graph 6 shows the evolution of real productivity and real wage.

Graph 5. Rates of employment in Mexico and USA, 1965-2015
(employments per one thousand inhabitants)
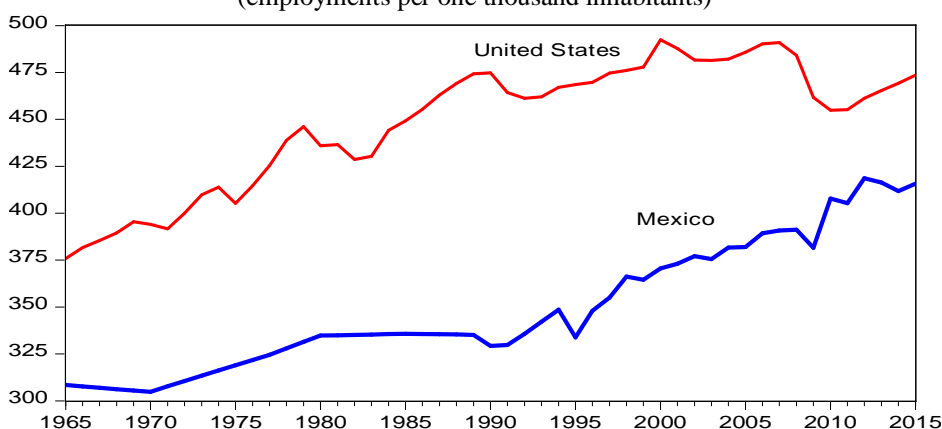
Source: Elaborated by authors from OECD Labour Forces and National Accounts.

Graph 6. Real productivity per worker and real wage in Mexico and USA
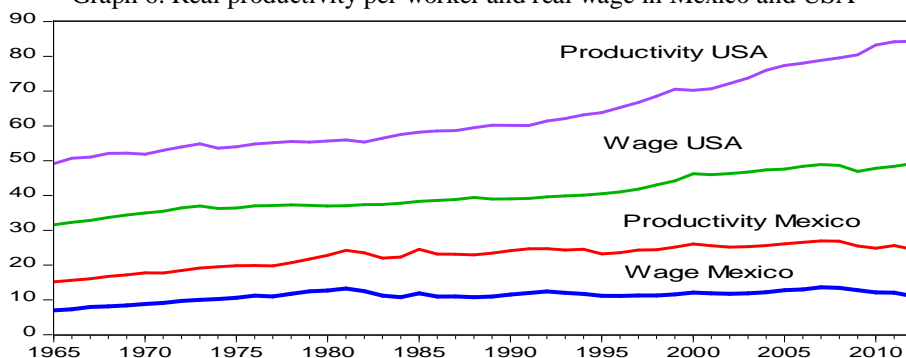
Source: elaborated by authors from OECD statistics and other sources. Data in USD at prices and PPPs of year 2000.

In graph 5 we may notice a positive evolution for that period, with employment rates much higher in 2015 in comparison with 1965. In the case of the U.S., data show a strong diminution in the period 2008-2011 and a recovery afterwards. In the case of Mexico, we may notice that there was a clear increase for the period 1995-2015.

Graph 6 shows the evolution of productivity and average real wage of Mexico, in USD at constant prices and Purchasing Power Parities (PPPs) of year 2000) and the United States (USD at constant prices of year 2000) for the period 1965-2015. Data of productivity per worker have been calculated as Gross Domestic Product divided by

Labour (number of employed people, both employees (wage earners) and self-employed people). Data of wages for the United States have been elaborated from OECD National Accounts and Labour Force statistics (Compensation of Employees divided by number of employees). Data for Mexico have been elaborated by authors, from several sources and estimations, as indicated in the Annex.

4. Econometric models: Impact of industry on GDP, Foreign Trade and Employment in Mexico and USA

In this section we present the estimations of several equations that show the positive impact of industry of exports, of exports on imports capacity and of industry on non industrial production. In the Annex we include analysis of causality and comments on the role of demand and supply, and the possible presence of feedback and/or interdependence.

Accordingly to Kaldor´s these equations show the positive impact that industry usually has as a great motor of development an employment. We also present the estimation of equations that relate employment with production and other variables. Data used in the estimations are included in the Annex.

We present the estimation of equations of Non-Industrial Production per head (QHNI) and Employment (LT) for Mexico (MX) and the United States (US). As PH is the sum of industrial and non-industrial production (QHI+QHNI), we notice the positive effect of industry on real GDP and on Employment.

Equation 1 relates Non-Industrial real-value per head (QHNI) with Industrial real value-added per head (QHI) and foreign trade given by real Exports per head (XH) and real Imports head (MH).

Equation 1. Non-Industrial Production in Mexico: QHNI

Dependent Variable: QHNI00MX			
Method: Least Squares			
Sample (adjusted): 1961 2012			
Included observations: 52 after adjustments			
Variable	Coefficient	Std. Error	t-Statistic	Prob.
QHNI00MX(-1)	1.003839	0.003249	308.9317	0.0000
D(QHI00MX)	2.963899	0.483478	6.130374	0.0000
D(XH00MX)	-0.368130	0.180719	-2.037035	0.0472
D(MH00MX)	0.355513	0.160875	2.209862	0.0319
R-squared	0.993202	Mean dependent var		4.245058
Adjusted R-squared	0.992777	S.D. dependent var		1.029773
S.E. of regression	0.087519	Akaike info criterion		-1.960109
Sum squared resid	0.367663	Schwarz criterion		-1.810014
Log likelihood	54.96284	Hannan-Quinn criter.		-1.902566
Durbin-Watson stat	1.890627			

The results of the estimation of this equation indicates a positive impact of QHI on QHNI. In equation 1, the sum of the coefficients of XH and MH would be expected to be greater than zero, accordingly to other international experiences, which does not occur in this case. This may be due to the effect of missing variables, and a more detailed model would contribute to improve the results.

Equation 2. Employment In Mexico depending on GDP/W and other variables

Dependent Variable: LTMX				
Method: Least Squares				
Sample (adjusted): 1966 2012				
Included observations: 47 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LTMX(-1)	1.002162	0.002268	441.8043	0.0000
D(GDP00MX/W00MX3)	74.40052	25.20432	2.951895	0.0050
D(PAMX)	0.692217	0.090651	7.636110	0.0000
R-squared	0.999329	Mean dependent var		29340.96
Adjusted R-squared	0.999299	S.D. dependent var		10029.45
S.E. of regression	265.6257	Akaike info criterion		14.06376
Sum squared resid	3104509.	Schwarz criterion		14.18185
Log likelihood	-327.4982	Hannan-Quinn criter.		14.10819
Durbin-Watson stat	1.763031			

Note: Mixed dynamic model that relates Employment in Mexico with its lagged value and the in crease of the ratio GDP/Wage and the increase of Active Population (PAMX). GDP00mx in billion USD2000 (Dollars at 2000 year prices and Exchange rates) . W00MX in thousand USD2000 per employee.

Equation 3, Non industrial production in the USA: QHNI

Dependent Variable: QHNI00U				
Method: Least Squares				
Sample (adjusted): 1961 2012				
Included observations: 52 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
QHNI00U(-1)	1.013596	0.001799	563.4935	0.0000
D(QHI00U)	1.027699	0.237487	4.327393	0.0001
D(XH00U)	-0.300959	0.311253	-0.966925	0.3384
D(MH00U)	0.300792	0.166640	1.805041	0.0773
R-squared	0.998080	Mean dependent var		22.86761
Adjusted R-squared	0.997960	S.D. dependent var		5.794125
S.E. of regression	0.261700	Akaike info criterion		0.230567
Sum squared resid	3.287370	Schwarz criterion		0.380663
Log likelihood	-1.994754	Hannan-Quinn criter.		0.288111
Durbin-Watson stat	1.555284			

In equation 4, the sum of the coefficients of XH and MH would be expected to be greater than zero, accordingly to other international experiences, which does not occur in this case. This may be due to the effect of missing variables, and a more detailed model would contribute to improve the results.

Equation 4. Employment in the United States

Dependent Variable: LTU				
Method: Least Squares				
Sample (adjusted): 1961 2012				
Included observations: 52 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LTU(-1)	0.986686	0.002349	419.9560	0.0000
D(GDP00U/W00U)	259.3174	52.11933	4.975456	0.0000
D(PAU)	1.310710	0.128875	10.17038	0.0000
R-squared	0.998807	Mean dependent var		109877.3
Adjusted R-squared	0.998759	S.D. dependent var		25674.66
S.E. of regression	904.6139	Akaike info criterion		16.50885
Sum squared resid	40097985	Schwarz criterion		16.62143
Log likelihood	-426.2302	Hannan-Quinn criter.		16.55201
Durbin-Watson stat	1.646072			

5. Conclusions

Mexico experienced an average increase of industrial real value-added per capita, around 15 USD per year (at constant prices of year 2000) both before NAFTA (period 1964-1993) and after NAFTA (for the period 1994-2012). The U.S. experienced higher increases: 75 USD per year in the first period and 39 per year in the second one. It is clear that the diminution of the increase in the U.S. after NAFTA was not caused by an increase of industry in Mexico, but to other problems of industrial delocalization.

We present our estimation of econometric models for Mexico and the United States showing the important impact of industry. Our conclusion, after the analysis of the literature, on the evolution of Mexico after NAFTA is that it had some positive effects but not enough to get an important and sustained increase of income per capita and wages in this country. Regarding the U.S. NAFTA has had also some positive effects, and the economy has evolved with important and sustained increase of economic development, income per capita and wages, both before and after NAFTA.

Our conclusion, on the evolution of Mexico after NAFTA, is that it had some positive effects but not enough to get an important and sustained increase of income per capita and wages in this country, because Mexico needs to reach a higher degree of industrial production per head.

Regarding the U.S. NAFTA has had also some positive effects, and the economy has evolved with important and sustained increase of economic development, income per capita and wages, both before and after NAFTA. Our recommendation is to increase cooperation between both countries in order to foster economic development having into account the convenience of increasing industrial development in Mexico in order to reach a higher degree of convergence

Bibliography

Blecker, R.A., Esquivel, G. (2010). NAFTA, Trade, and Development Focus. CESIFO. http://www.cesifo-group.de/DocDL/forum4-10-focus3.pdf

Chen, D. and Martinez-Vazquez, J.(2001). The impact of NAFTA and Options to Tax Reform in Mexico. World Bank Working Papers in Domestic finance. Saving, financial systems, and stock markets. with number 2669.[1]

Dussel, E.(2002). Employment, Productivity and Foreign Trade in the Mexican Economy (in Spanish). Investigación Económica. Revista de la UNAM, Mexico.

Dussel, E. (2007). Foreign Direct Investment in Mexico. (In Spanish: La inversión extranjera directa en México: desempeño y potencial : una perspectiva macro, meso, micro y territorial). Edited by Siglo XXI.

Gandolfi, D., Halliday, T., Robertson, R. (2014). "Globalization and Wage Convergence: Mexico and the United States". Working Paper of the University of Hawaii at Manoa, number 14-5.

Fukao, K., Okubo, T, and Stern, R.M. (2002). An Econometric Analysis of Trade Diversion under NAFTA.[1]

Guisan, M.C., Aguayo, E and Exposito, P. (2001). Economic Growth and Cycles: Cross-country Models of Education, Industry and Fertility and International Comparisons. *Applied Econometrics and International Development*, Vol.1-1, pp. 9-37.[1,2]

Guisan, M.C. and Aguayo, E. (2002). Education, Industry, Trade and Development of American Countries, 1980-99. *Applied Econometrics and International Development*, Vol.2-1, pp. 83-106.[1,2]

Guisan, M.C. and Cancelo, M.T. (2002). Econometric Models of Foreign Trade in OECD countries. Applied Econometrics and International Development, Vol. 2-2, pp. 65-81.[2]

Guisan, M.C. y Cardim-Barata, S.(2003). "Industria y desarrollo regional en Brasil". *Estudios Económicos Regionales y Sectoriales*, Vol. 3-1, pp. 103-126.

Guisan, M.C and Martinez, C. (2003). Education, Industrial Development and External Trade in Argentina: Econometric Models and International Comparisons. Working Paper of the series *Economic Development*, edited by Euro-American Association of Economic Development Studies.

Guisan, M.C. (2003a). Econometric Models of Employment by Sector in Mexico, the USA, Canada and the European Union, in "*Crecimiento económico en los países de la OCDE 2: Modelos macroeconométricos de producción, consumo, comercio exterior y empleo en España, México, USA y UE",* edited by Guisan et al(2003), published in the book series Economic Development n.9 by AHG, distribution Mundi-Prensa, Madrid.[1,2]

Guisan, M.C. and Aguayo, E. (2005). "Employment, Development and Research Expenditure in the European Union: Analysis of Causality and Comparison with the

United States, 1993-2003", *International Journal of Applied Econometrics and Quantitative Studies,* Vol.2-2.[1,2]

Guisan, M.C., Aguayo, E. (2006). Employment By Sector In The European Union, The United States, Mexico And Canada, 1985-2005, Regional and Sectoral Economic Studies, Vol. 6-1. [1,2]

Gruben, W.C.(2001). Did NAFTA Really Cause Mexico´s High Maquiladora Growth?. Federal Reserve Bank of Dallas in its series Center for Latin America Working Papers, number 0301.[1]

Hanson, G.H. (2003). What Has Happened to Wages in México since NAFTA?. NBER Working Paper No. 9563.[1]

Ianchovichina, E., Nicita, A, and Soloaga, I.(2001). Trade Reform and Household Welfare: the Case of Mexico.[1]

Krueger, A. O. Trade Creation and Trade Diversion Under NAFTA. National Bureau of Economic Research, NBER Working Papers number 7429.

Mejía-Reyes, P. (2001). "Why National Business Cycles are Largerly Independent in Latin America?". *Ciencia Ergosum*, Universidad Autónoma del Estado de México, Toluca; pp. 10-20.

Mejía-Reyes, P. (2002). "¿Hace falta una política industrial en México?". *Ciencia Ergosum* Vol. 9-3, Universidad Autónoma del Estado de México, Toluca; pp. 231-248.

OECD. Several Years. Stan data base of industrial Statistics and National Accounts, Paris.

Robbins, D.J.(1999). Gender, Human Capital and Growth: Evidence from Six Latin American Countries. OECD Development Centre. Technical Paper n.151, OECD, Paris.

Scott, R.D. (2014). The effects of NAFTA in US trade, Jobs and Investment

Shahabuddin, S. (2011). NAFTA and its effects on the USA: revisited. *International Journal of Economics and Business Research (IJEBR),* Vol. 3, No. 4.

Unger, K. (2007). [Apertura y empleos: la economÃƒÂa de los sectores comerciables y no comerciables de las regiones de MÃƒÂ©xico](#)

United Nations(2000). International Trade Statistics Yearbook, New York.

Wall, H.J. (2002). NAFTA and the Geography of North American Trade. Federal Reserve Bank of St. Louis, Working Papers number 2000-017.[1]

Zorrilla, L. (2003). La legislación y la política agrarias como factores del cambio social. Experiencia de México. Ponencia Instituto Interarmericano de Cooperación para la Agricultura, Sao Luis, Maranhao. Brasil.

---

[1] These articles and working papers are available on-line at http://ideas.repec.org
[2] Information on these publications at: http://www.usc.es/economet/eaa.htm

Annex

This Annex includes some complementary data. We may update this Annex with new information, particularly about the evolution of Wages of Mexico in purchasing power paritites.
 Data of average wage of Mexico in graph 6, in PPPs, have been elaborated by authors, from the printed edition of OECD National Accounts, in years with available data, and from several sources and our own estimations

Table A1. Data of Mexico: QHI, QHNI, XH, MH, thousand USD 2000. Gross Domestic Product (GDP) in Bn USD 2000. Employment (LT), Activa Population (PA) thousand people.

obs	QHI00 MX	QHNI00 MX	XH00 MX	MH00 MX	GDP00 MX	LT MX	PA MX
1960	0.453	2.287	0.145	0.281	97.392	11675	12036
1961	0.460	2.301	0.151	0.254	101.294	12022	12394
1962	0.463	2.333	0.158	0.245	105.921	12377	12760
1963	0.489	2.422	0.164	0.253	113.836	12745	13139
1964	0.544	2.575	0.171	0.307	125.937	13125	13531
1965	0.564	2.653	0.180	0.307	134.120	13528	13946
1966	0.585	2.721	0.189	0.298	142.381	13939	14370
1967	0.600	2.790	0.178	0.312	150.832	14366	14810
1968	0.626	2.893	0.192	0.242	161.769	14805	15263
1969	0.649	2.955	0.209	0.319	171.163	15259	15731
1970	0.673	3.044	0.220	0.337	182.399	15729	16216
1971	0.668	3.079	0.221	0.311	190.015	16410	16917
1972	0.701	3.233	0.249	0.331	206.129	17116	17645
1973	0.739	3.388	0.274	0.374	223.470	17848	18400
1974	0.758	3.483	0.266	0.436	237.129	18591	19166
1975	0.767	3.576	0.235	0.424	250.426	19344	19942
1976	0.780	3.613	0.266	0.416	261.048	20107	20729
1977	0.784	3.630	0.296	0.363	270.034	20878	21524
1978	0.839	3.806	0.321	0.430	292.316	21662	22332
1979	0.902	4.027	0.351	0.543	319.068	22444	23138
1980	0.940	4.235	0.360	0.694	345.631	23215	23946
1981	0.989	4.512	0.393	0.798	376.033	23760	24513
1982	0.959	4.379	0.468	0.485	373.374	24309	25083
1983	0.877	4.117	0.519	0.314	357.323	24861	25656
1984	0.897	4.164	0.537	0.362	370.195	25410	26227
1985	0.940	4.726	0.510	0.399	416.500	25955	26793
1986	0.878	4.463	0.528	0.361	400.800	26493	27352
1987	0.889	4.443	0.567	0.372	408.300	27031	27912
1988	0.897	4.394	0.587	0.499	413.400	27576	28478
1989	0.942	4.463	0.608	0.577	430.700	28121	29045
1990	0.981	4.589	0.628	0.678	452.600	28669	29615
1991	0.970	4.601	0.634	0.749	471.700	29226	30144
1992	0.990	4.678	0.653	0.880	488.800	30259	31230
1993	0.969	4.706	0.694	0.879	498.300	31341	32382
1994	0.991	4.832	0.804	1.045	520.300	32439	33607
1995	0.930	4.428	1.027	0.867	488.200	32175	34310
1996	1.008	4.540	1.197	1.047	513.400	33364	35438
1997	1.086	4.752	1.307	1.266	548.200	34510	37193

1998	1.143	4.903	1.445	1.452	575.700	36067	38242
1999	1.173	5.014	1.603	1.633	597.400	36351	38471
2000	1.226	5.254	1.834	1.949	636.700	37390	38608
2001	1.174	5.219	1.742	1.892	636.500	38100	38663
2002	1.153	5.212	1.747	1.896	641.400	39000	39695
2003	1.183	5.202	1.775	1.888	650.400	39329	40062
2004	1.215	5.361	1.918	2.052	676.400	40443	41738
2005	1.237	5.486	2.009	2.189	698.100	40931	41941
2006	1.296	5.689	2.144	2.391	731.700	42201	43234
2007	1.310	5.835	2.203	2.511	755.100	42907	44063
2008	1.274	5.738	2.114	2.550	764.161	43538	45121
2009	1.162	5.336	1.842	2.076	717.547	43063	45415
2010	1.217	5.575	2.193	2.470	756.295	46598	49133
2011	1.236	5.734	2.345	2.636	785.336	46892	49482
2012	1.256	5.641	2.456	2.746	786.069	49003	51477

Note: Data per inhabitant in thousand USD at constant prices and Exchange rates of year 2000: QHI (Industry), QHNI (Non industrial sectors), XH (Exports), MH (Imports). Source: Elaborated by authors from OEC D statistics.

Table A2. Data of Mexico, 1995-2012
Population (national), Employment (total and by sector)

	Pobmx	LT	LA	LI	LB	LS
1995	94490.0	32174.9	7495.5	5239.2	2244.8	17195.4
1996	95877.0	33495.8	7289.9	5889.9	2246.2	18069.8
1997	97205.0	35425.2	8241.8	6282.6	2233.0	18667.8
1998	98485.0	36357.0	6978.7	6987.4	2678.5	19712.4
1999	99706.0	36774.9	7395.4	7337.6	2667.8	19374.1
2000	100896.0	37594.3	6500.8	7671.2	3022.1	20400.2
2001	102122.0	37684.5	6516.7	7474.6	2953.7	20739.5
2002	103418.0	38559.8	6594.0	7211.7	3115.6	21638.5
2003	104720.0	38877.6	6208.4	7104.7	3264.2	22300.3
2004	105952.0	40216.1	6280.0	7424.2	3245.9	23266.0
2005	107151.0	40470.4	5950.5	7246.0	3163.9	24110.0
2006	108409.0	41866.8	5905.5	7384.3	3438.1	25138.9
2007	109787.0	42567.3	5655.1	7490.1	3565.2	25856.9
2008	111299.0	43537.6	5651.5	7575.6	3627.3	26683.2
2009	112853.0	43063.1	5558.1	6957.9	3501.8	27045.3
2010	114256.0	46597.6	6336.1	7340.3	3621.4	29299.8
2011	115683.0	46891.6	6153.0	7567.3	3649.3	29522.0
2012	117054.0	49003.4	6489.9	7723.3	3603.0	31187.2

Source: OECD. Data in thousand people. L= Labour (Employment), T means Total, A is Agriculture and Fishing, I is Industry, B is Building and S is Services.

Table A3. Datos Macro: Mexico. Average Wage. Current Euros

Year	Average Wage
2000	5564
2001	6505
2002	6395
2003	5108
2004	4703
2005	5153
2006	5382
2007	5175
2008	5017
2009	4524
2010	5238
2011	5286
2012	5634
2013	5831
2014	5848
2015	6105
2016	5459

Source: http://www.datosmacro.com

Table A4. Territorial distribution of population in Mexico, 1895-2010 (thousand people)

	Entidad federativa	1895	1900	1950[a]	1960	1970	1980	1990	1995	2000	2005	2010
1	Aguascalientes	104 693	102 416	188 075	243 363	338 142	519 439	719 659	862 720	944 285	1 065 416	1 184 996
2	Baja California	42 875	47 624	226 965	520 165	870 421	1 177 886	1 660 855	2 112 140	2 487 367	2 844 469	3 155 070
3	Baja California Sur [b]	NA	NA	60 864	81 594	128 019	215 139	317 764	375 494	424 041	512 170	637 026
4	Campeche	88 144	86 542	122 098	168 219	251 556	420 553	535 185	642 516	690 689	754 730	822 441
5	Coahuila de Zaragoza	242 021	296 938	720 619	907 734	1 114 956	1 557 265	1 972 340	2 173 775	2 298 070	2 495 200	2 748 391
6	Colima	55 718	65 115	112 321	164 450	241 153	346 293	428 510	488 028	542 627	567 996	650 555
7	Chiapas	320 694	360 799	907 026	1 210 870	1 569 053	2 084 717	3 210 496	3 584 786	3 920 892	4 293 459	4 796 580
8	Chihuahua	265 546	327 784	846 414	1 226 793	1 612 525	2 005 477	2 441 873	2 793 537	3 052 907	3 241 444	3 406 465
9	Distrito Federal	474 860	541 516	3 050 442	4 870 876	6 874 165	8 831 079	8 235 744	8 489 007	8 605 239	8 720 916	8 851 080
10	Durango	296 979	370 294	629 874	760 836	939 208	1 182 320	1 349 378	1 431 748	1 448 661	1 509 117	1 632 934
11	Guanajuato	1 069 418	1 061 724	1 328 712	1 735 490	2 270 370	3 006 110	3 982 593	4 406 568	4 663 032	4 893 812	5 486 372
12	Guerrero	420 926	479 205	919 386	1 186 716	1 597 360	2 109 513	2 620 637	2 916 567	3 079 649	3 115 202	3 388 768
13	Hidalgo	563 824	605 051	850 394	994 598	1 193 845	1 547 493	1 888 366	2 112 473	2 235 591	2 345 514	2 665 018
14	Jalisco	1 114 765	1 153 891	1 746 777	2 443 261	3 296 586	4 371 998	5 302 689	5 991 176	6 322 002	6 752 113	7 350 682
15	**México**	842 873	934 463	1 392 623	1 897 851	3 833 185	7 564 335	9 815 795	11 707 964	13 096 686	14 007 495	15 175 862

#	State	1895	1900	1950	1960	1970	1980	1990	1995	2000	2005	2010
16	Michoacán *1	898 809	935 808	1 422 717	1 851 876	2 324 226	2 868 824	3 548 199	3 870 604	3 985 667	3 966 073	4 351 037
17	Morelos	159 123	160 115	272 842	386 264	616 119	947 089	1 195 059	1 442 662	1 555 296	1 612 899	1 777 227
18	Nayarit	149 807	150 098	290 124	389 929	544 031	726 120	824 643	896 702	920 185	949 684	1 084 979
19	Nuevo León	311 665	327 937	740 191	1 078 848	1 694 689	2 513 044	3 098 736	3 550 114	3 834 141	4 199 292	4 653 458
20	Oaxaca	897 182	948 633	1 421 313	1 727 266	2 015 424	2 369 076	3 019 560	3 228 895	3 438 765	3 506 821	3 801 962
21	Puebla	992 426	1 021 133	1 625 830	1 973 837	2 508 226	3 347 685	4 126 101	4 624 365	5 076 686	5 383 133	5 779 829
22	Querétaro	232 305	232 389	286 238	355 045	485 523	739 605	1 051 235	1 250 476	1 404 306	1 598 139	1 827 937
23	Quintana Roo [c]	NA	NA	26 967	50 169	88 150	225 985	493 277	703 536	874 963	1 135 309	1 325 578
24	San Luis Potosí	571 420	575 432	856 066	1 048 297	1 281 996	1 673 893	2 003 187	2 200 763	2 299 360	2 410 414	2 585 518
25	Sinaloa	261 050	296 701	635 681	838 404	1 266 528	1 849 879	2 204 054	2 425 675	2 536 844	2 608 442	2 767 761
26	Sonora	192 721	221 682	510 607	783 378	1 098 720	1 513 731	1 823 606	2 085 536	2 216 969	2 394 861	2 662 480
27	Tabasco	134 956	159 834	362 716	496 340	768 327	1 062 961	1 501 744	1 748 769	1 891 829	1 989 969	2 238 603
28	Tamaulipas	209 106	218 948	718 167	1 024 182	1 456 858	1 924 484	2 249 581	2 527 328	2 753 222	3 024 238	3 268 554
29	Tlaxcala	168 358	172 315	284 551	346 699	420 638	556 597	761 277	883 924	962 646	1 068 207	1 169 936
30	Veracruz *2	863 220	981 030	2 040 231	2 727 899	3 815 422	5 387 680	6 228 239	6 737 324	6 908 975	7 110 214	7 643 194
31	Yucatán	298 569	309 652	516 899	614 049	758 355	1 063 733	1 362 940	1 556 622	1 658 210	1 818 948	1 955 577
32	Zacatecas	456 241	462 190	665 524	817 831	951 462	1 136 830	1 276 323	1 336 496	1 353 610	1 367 692	1 490 668

*1= Michoacán de Ocampo *2= Veracruz de Ignacio de la Llave. Source: OECD

Total Mexico.

Population	1895	1900	1950[a]	1960	1970	1980	1990	1995	2000	2005	2010
Total	12 700 294	13 607 259	25 791 017	34 923 129	48 225 238	66 846 833	81 249 645	91 158 290	97 483 412	103 263 388	112 336 538

About the authors: Professors M.C. Guisan and E.Aguayo, have a long experience in the publication of articles and books related with economic development in North America, Latin America, Europe and OECD countries. As seen in the Blogs of our Association (in English and in Spanish) they have participated in international Congresses and Meetings related with Mexico and other American countries, the most recent in year 2016:
Aguayo, E. (2016). "Modelos (macro)econométricos y factores de desarrollo regional". Conferencia magistral. VIII Coloquio Internacional de Investigación. Desarrollo económico regional y sustentable. UAEM. Toluca, 8 y 9 de
septiembre. http://web.uaemex.mx/feconomia/docs/cartel_coloquio.pdf
International Blogs of our Association:
https://euroamericanassociation.blogspot.com.es (English)
https://economiaydesarrollointernacional.blogspot.com.es (Spanish)