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Title: Mexico: Economic performance of local economies. 2003-2013.

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Editorial label ECORFAN: 607-8324
 BCIE Control Number: 2016-01
 BCIE Classification (2016): 221116-0101

Pages: 34
RNA: 03-2010-032610115700-14

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Mexico: Economic performance of local economies. 2003-2013.

- Introduction.
- Methodology.
- Diversity, economic diversification and performance of regions of Mexico.
- Conclusions.

Introduction.

- Before 1985:
 - Trade protectionism in Mexico.
 - 1947:
 - Import substitution model.
- 1985 onwards:
 - Mexico undertook a quick trade openness.
 - 1986 admission to the GATT (General Agreement on Tariffs and Trade).
 - Era of trade negotiations, both bilateral and multilateral, aimed at the holding of multiple trade liberalization agreements.

Fast growth of TRADE... specially from manufacturing products...

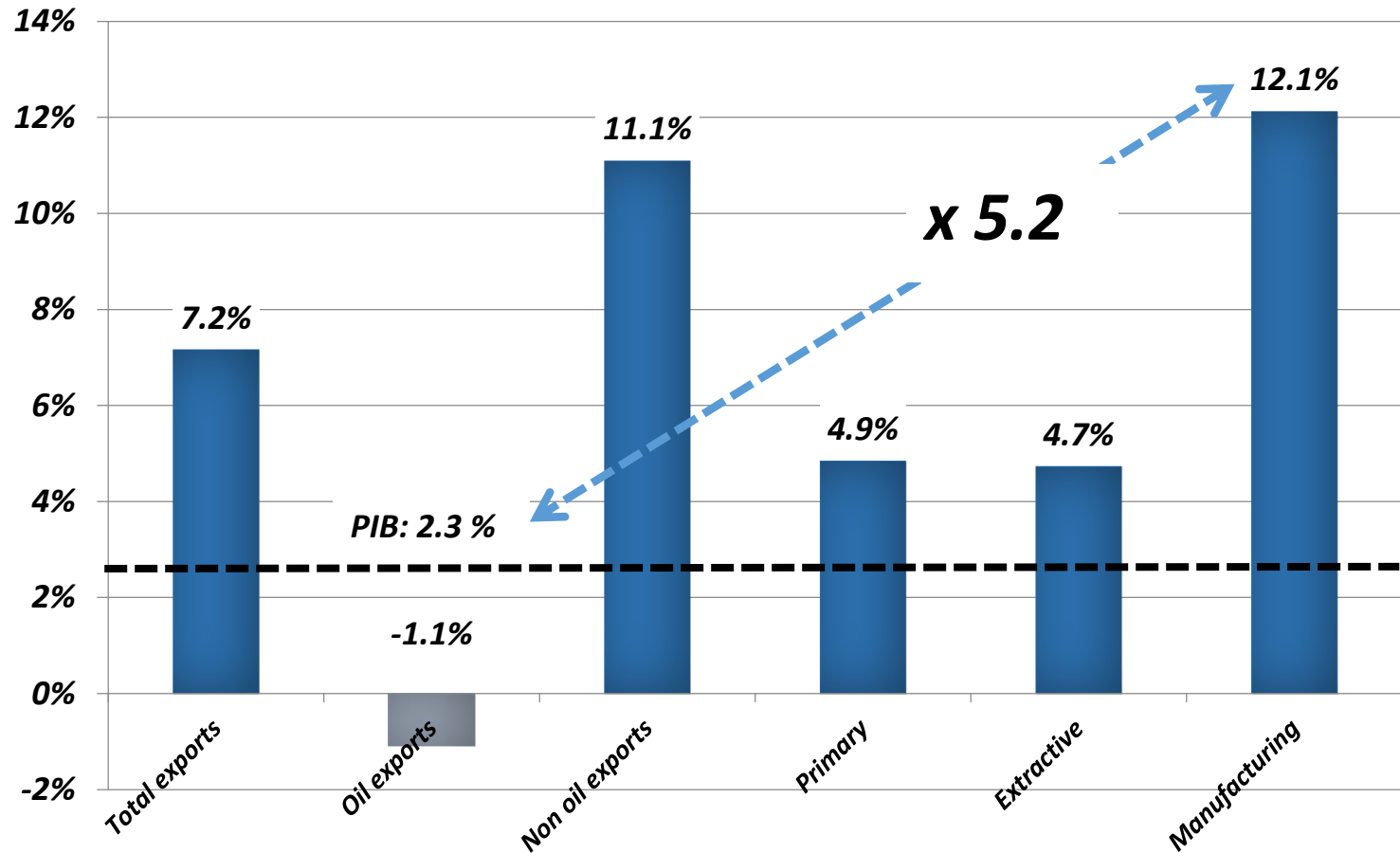
Real absolute value over period:

GDP: X 2

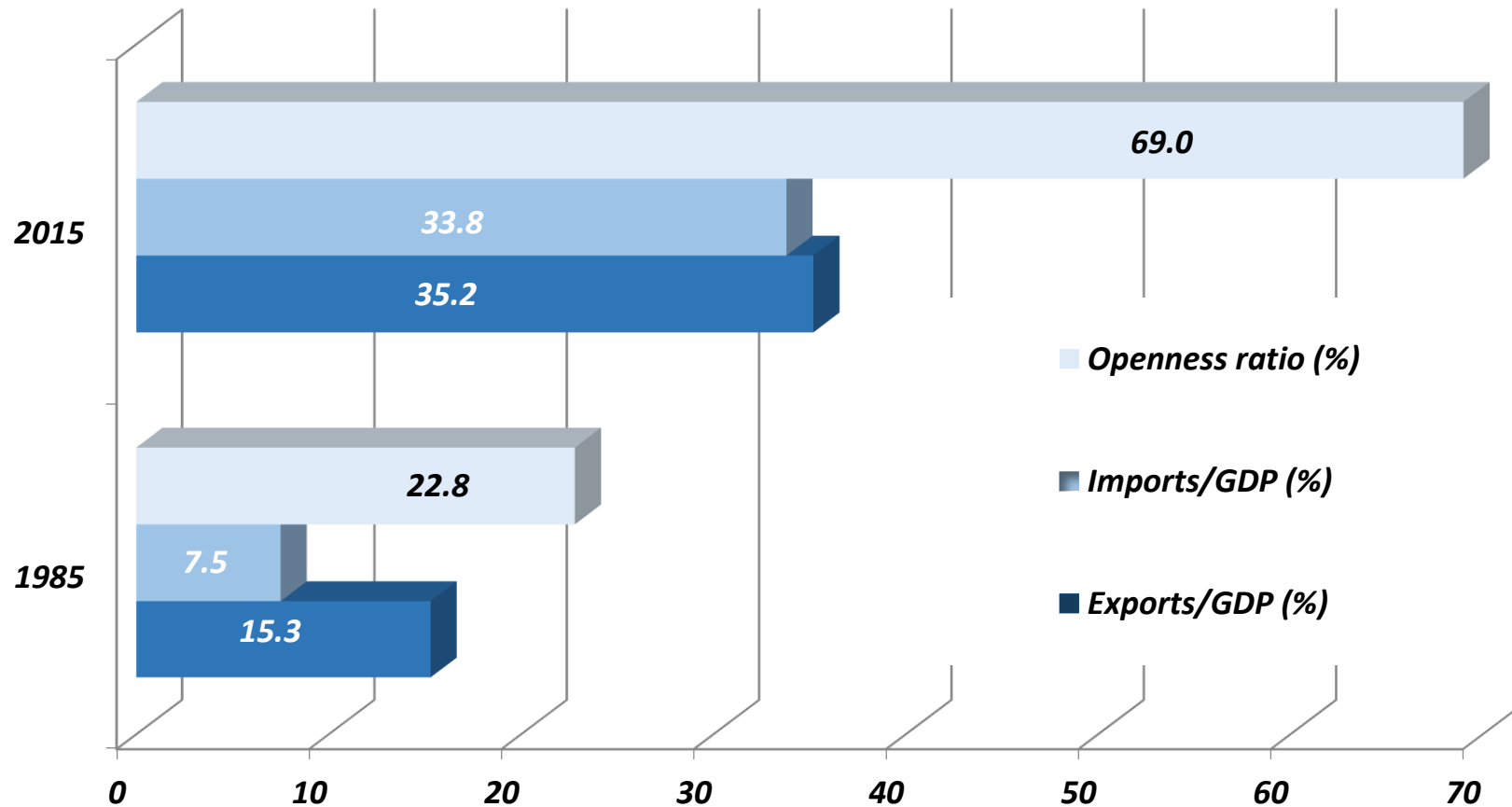
Total Exports: X 8

Manufacturing Exports: X 31

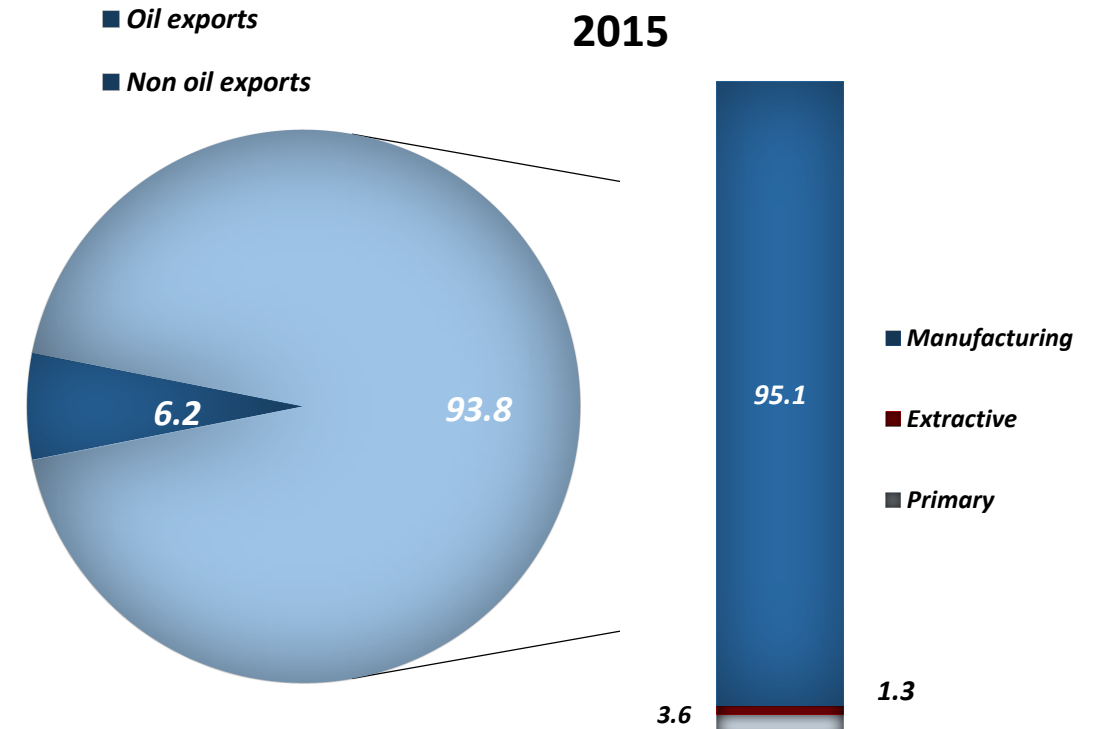
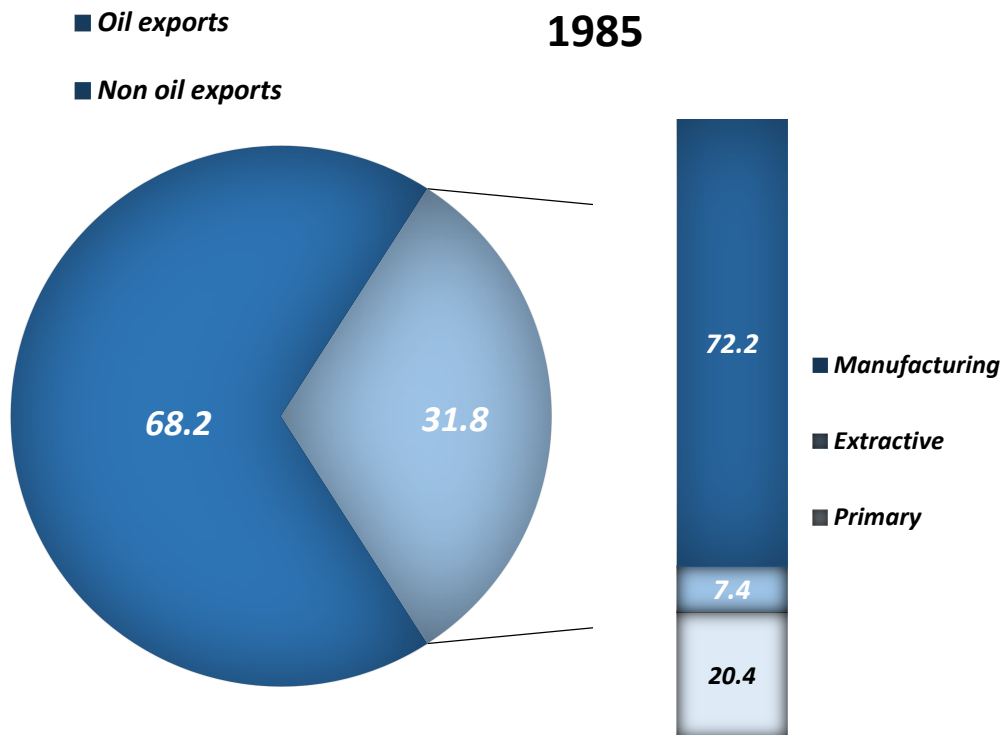
Average rates of real annual growth. 1985-2015.



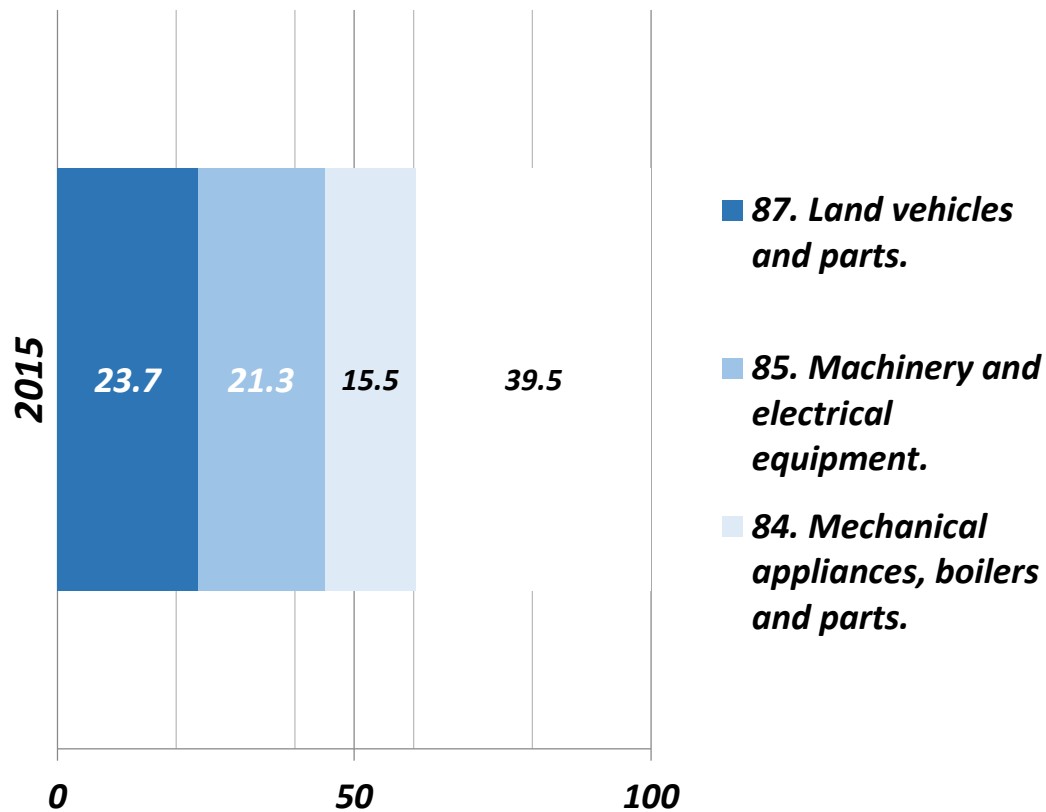
Openness ratio ((Imports+Exports/gdp)) imports/gdp (%) and exports/gdp (%)



Strong dynamic of non oil, manufacturing exports...



high concentration of exports.



Exports distribution by chapters of Harmonized System of Classification. 3 Main chapters (60.5 %).

11 of 599 fractions of HSC (1.8 %). Participation on total exports. (%).

Harmonized Fraction Description	Participation (%)
Automobiles.	8.6
Vehicle parts and accessories.	6.6
Vehicles for transport of goods.	6.6
Crude petroleum.	4.9
Machines for data process.	4.8
Televisions.	4.4
Telephonic or telegraphic electrical equipment.	4.2
Other machinery and electrical equipment.	3.1
Insulated electric conductors.	3
Other mechanical equipment and parts.	2.9
Tractors.	2.3
SUBTOTAL	50.6

Questions and predictions BASED ON foreign trade standard model.

1. What have been the impacts of these changes on the performance of the Mexican economy?
 2. How have these effects manifested in their spatial and sectoral scope?
- Expansion of international trade deepens economies specialization and brings access to scale economies.
 - It can produced differentiated effects on income and over the dynamics of sectoral and regional economies (Krugman and Obstfeld 2001).

spatial and sectoral dimension of changes in trade policy in developing countries.

- Theorized by Krugman and Livas (1992).
- Spatial location of productive factors is the result of a tension between centripetal and centrifugal forces. The first ones are primarily determined by the interaction between economies of scale, market size and transportation costs (aspects linked with the backward and forward productive linkages). Main dispersion forces: Increased costs of urban mobility and land rent.
- Formation of megacities in these countries is a byproduct of trade protectionism in relatively small domestic markets. Balance between centripetal and centrifugal forces promotes a strong spatial concentration of productive factors.
- Trade liberalization and strengthening the external market alter this balance and allow a spatial relocation of economic activities.

spatial and sectoral dimension of changes in trade policy in developing countries.

- Empirical evidence for Mexico: Trade liberalization led to a reallocation of industrial activities from Mexico City towards twenty metropolitan areas located to the north of Mexico City (Dávila, 2011).
- Multiple research has found that this transformations has not been homogeneous in space and sectors (growth dynamics has focused on the metalworking, iron and steel, electronics, textile and automotive industries).
- Economic rationality: Optimizing transport costs of inputs, goods and services to the external market, which is heavily concentrated in United States of America (USA).
- Search for economies of agglomeration, especially scale and location economies, as well as Marshallian externalities, constitute the economic logic of these space relocation patterns. That explain its concentration on a few sectors and metropolitan areas.

GOALS.

- 1) Analyze evolution of final demand for state, mesoregional and national economies;
- 2) Build input-output models for the national economy, as well as for its seven mesoregions and the 32 federal entities of Mexico, for the years 2003 and 2008 and 2012;
- 3) Use Siegel et al. (1995) model to assess, in each geographical area, the impact of the final demand changes on economic performance, and;
- 4) Apply Sharp ratio (1994) to evaluate the feedback between economic growth and volatility.

Diversity, diversification.

Diversity and Diverse,

Related to a static and positive concept

State of: difference, variety, inequality.

Diversify and Diversification:

Process that makes things more different or varied (positive and dynamic concept)

Selection of assets (sectors) to minimize the risk (instability in output or employment) (dynamic and normative concept).

Economic diversity.

- **Measures of economic diversity (Wagner, 2000),**
 - **Equi-proportionate measures**
 - **Measures based on the type of industries**
 - **Measures based on portfolio theory**
 - **Measures using input-output models and indicators**
 - Including intersectoral flows in the analysis of economic diversity,
 - Better perception of complexity, structure and performance of regional economies

METHODOLOGY

Siegel *et al* (1995) propose a tool for assessing the impact of the transformations in the structure of the final demand on the performance of an economic system.

Method developed by Markowitz (1959) for the analysis of portfolio optimization of investment

Input-Output model (Leontief. 1941)

VARIANCE OF GROSS PRODUCTION VALUE

$$V[\mathbf{x}] = \mathbf{w} \mathbf{R} \text{Cov}[\mathbf{F}] \mathbf{R}^T \mathbf{w}^T$$

w

- $1 \times n$ Vector that measures sectoral participation in final demand.

R

- Regional Leontief inverse matrix.

Cov[F]

- Symmetrical matrix ($n \times n$) obtained by calculating the variance-covariance of final demands.

T

- Indicates the transposition or corresponding matrix or vector.

Volatility

- Obey the structural relationships underlying in the supply and demand of the economy studied.

expected growth in regional production

$$E[\Delta \mathbf{x}] = \mathbf{R}E\mathbf{f}_{t+1} - \mathbf{R}E\mathbf{f}_t$$

W

- $1 \times n$ Vector that measures sectoral participation in final demand.

R

- Regional Leontief inverse matrix.

$COV[F]$

- Symmetrical matrix ($n \times n$) obtained by calculating the variance-covariance of final demands.

T

- Indicates the transposition or corresponding matrix or vector.

Economic
performance


- Function of the economic structure.

Diversity, economic diversification and performance

The performance of an economy is modeled under different economic policy scenarios:

- Either through changes in the level and structure of the final demand, or by changes in the intermediate consumption quotients.
- The performance is determined by the expected production growth and/or employment, as well as the evolution of its volatility (quantified through its variance or standard deviation).

Sources of information

- 
- National IOT for 2003, 2008 and 2012, produced by Mexican Agency of Information (INEGI) with UN SNA method.
 - Regionalisation of national IOT with Flegg et al. (1995 and 1997) method.

- 
- Gross domestic product series for each state of Mexico.

- 
- Estimations of gross production value and final demand.

Regions of Mexico.

Determined by:

- Geographical contiguity (exclusiveness);
- Distance from the northern border;
- Relevant geographical traits; relative location vis a vis major mountain ranges and coastlines.



Regions of Mexico.

REGION	STATE	Participation (%) on		
		Surface	Population	Gross production
1. Northwest	Baja California; Chihuahua; Sonora; Baja California Sur; Sinaloa.	32.1%	11.1%	13.1%
2. Northeast	Coahuila; Nuevo León; Tamaulipas.	15.1%	9.3%	15.6%
3. Central-North Plateau	Aguascalientes; Durango; Guanajuato; San Luis Potosí; Zacatecas	15.1%	10.9%	9.2%
4. West	Colima; Jalisco; Michoacán; Nayarit.	8.7%	11.9%	10.2%
5. Centre	Distrito Federal; Hidalgo; México; Morelos; Puebla; Querétaro; Tlaxcala	5.1%	33.7%	34.8%
6. South	Chiapas; Guerrero; Oaxaca	11.8%	10.6%	4.7%
7. Southeast Gulf	Campeche; Quintana Roo; Tabasco; Veracruz	12.1%	12.4%	13.0%
Total	MEXICO	100.0%	100.0%	100.0%

MEXICO, MESOREGIONS AND STATES OF MEXICO: Indices of sectoral concentration of the final demand in 2003 (%) and changes in concentration levels during the periods 2003-2013, 2003-2013, 2003-2013 (%).

	Final demand. Concentration Index 2013.		Change on final demand concentration indexes. 2003-2013		Total Change Contribution
	8 sectors	4 sectors	8 sectors	4 sectors	4 /8 sectors
Average					
Regiones	43.0%	29.0%	9.2%	7.6%	83.1%
States	44.5%	30.6%	10.7%	8.9%	82.9%
National	43.9%	32.1%	9.7%	8.4%	86.2%
Extreme values on regions					
Maximum ^a	50.8%	37.7%	10.2%	9.4%	91.5%
Minimum ^b	38.0%	23.4%	7.8%	6.7%	na
Extreme values on states					
Maximum ^c	67.2%	59.8%	18.9%	18.5%	97.7%
Minimum ^d	18.5%	6.6%	4.8%	4.0%	82.4%

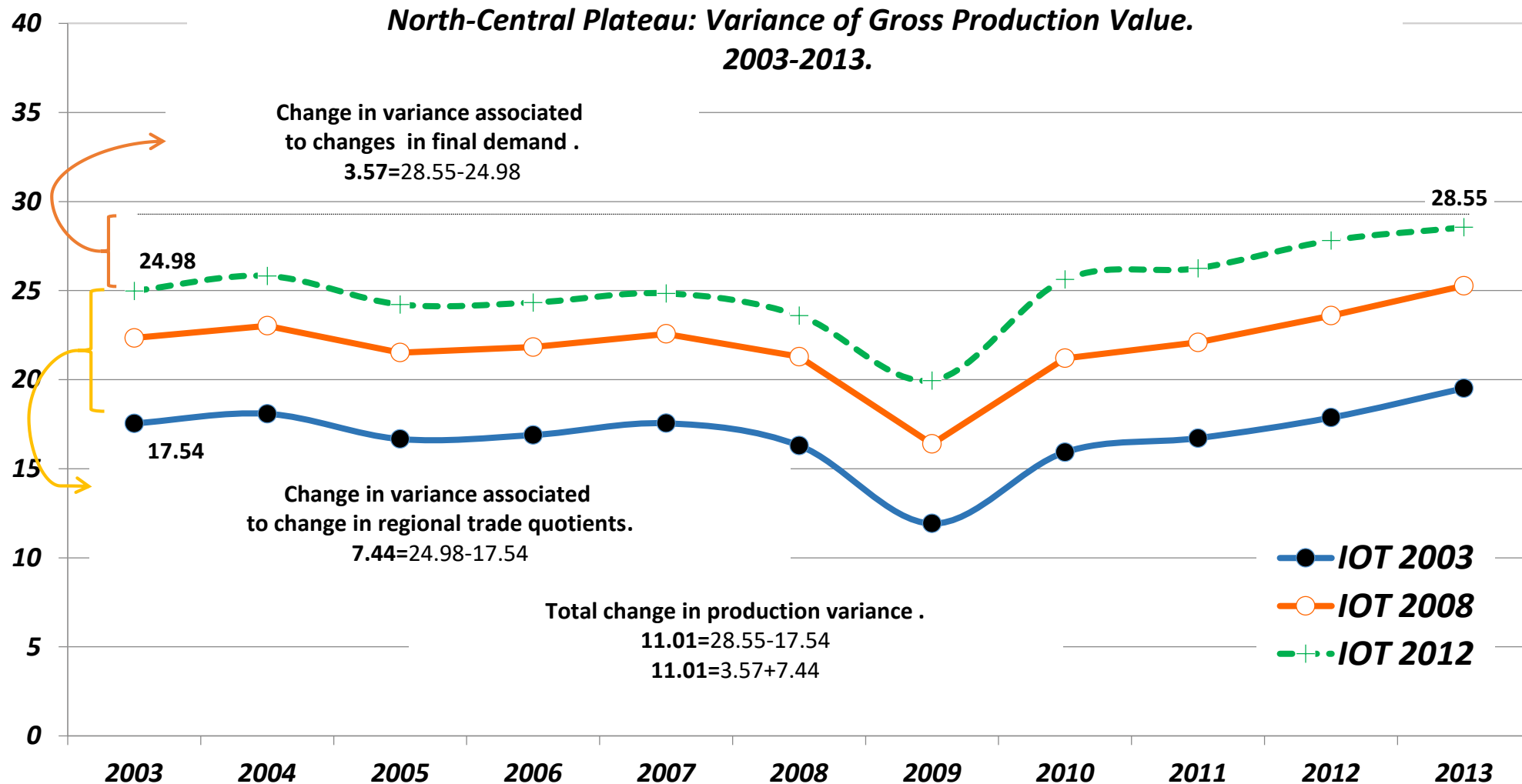
^a Northeast region in all cases

^b South, West, Central-North Plateau, respectively

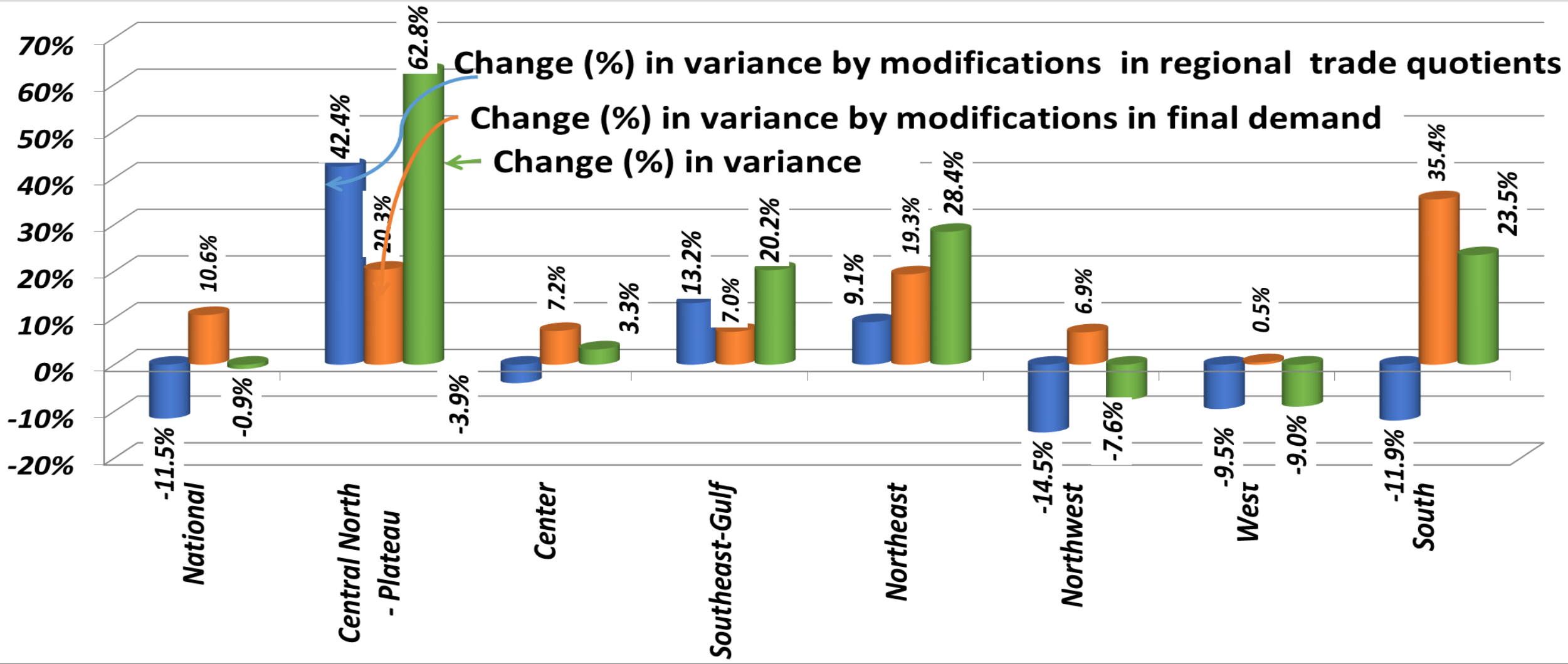
^c Tabasco, Tabasco, Sonora and Sonora, respectively

^d Campeche, Puebla, Guanajuato y Guanajuato, respectively

Performance of variance of the gross production value

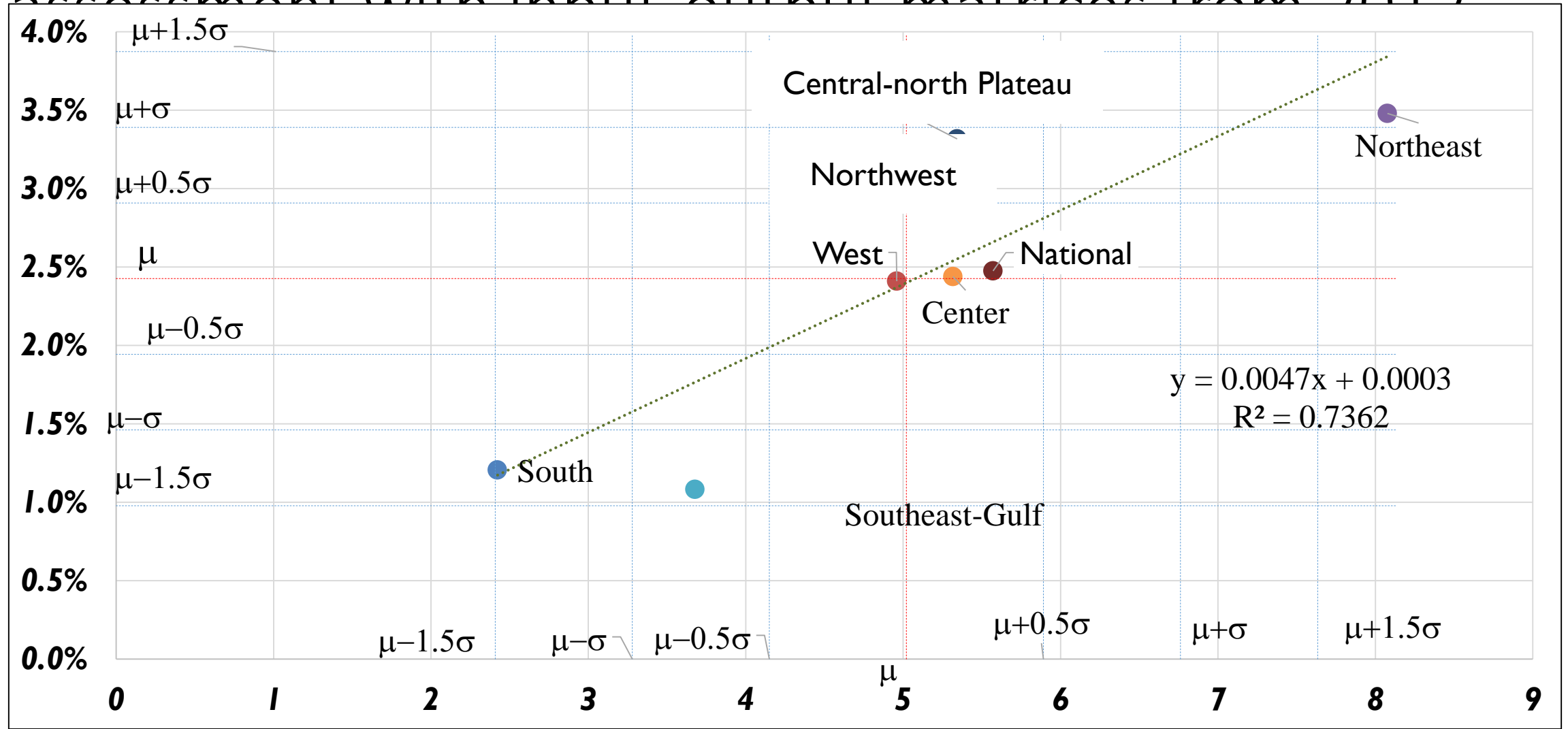


Factors of changes in the variance of the gross production value. Period 2003-2013. (Percentage of the total).



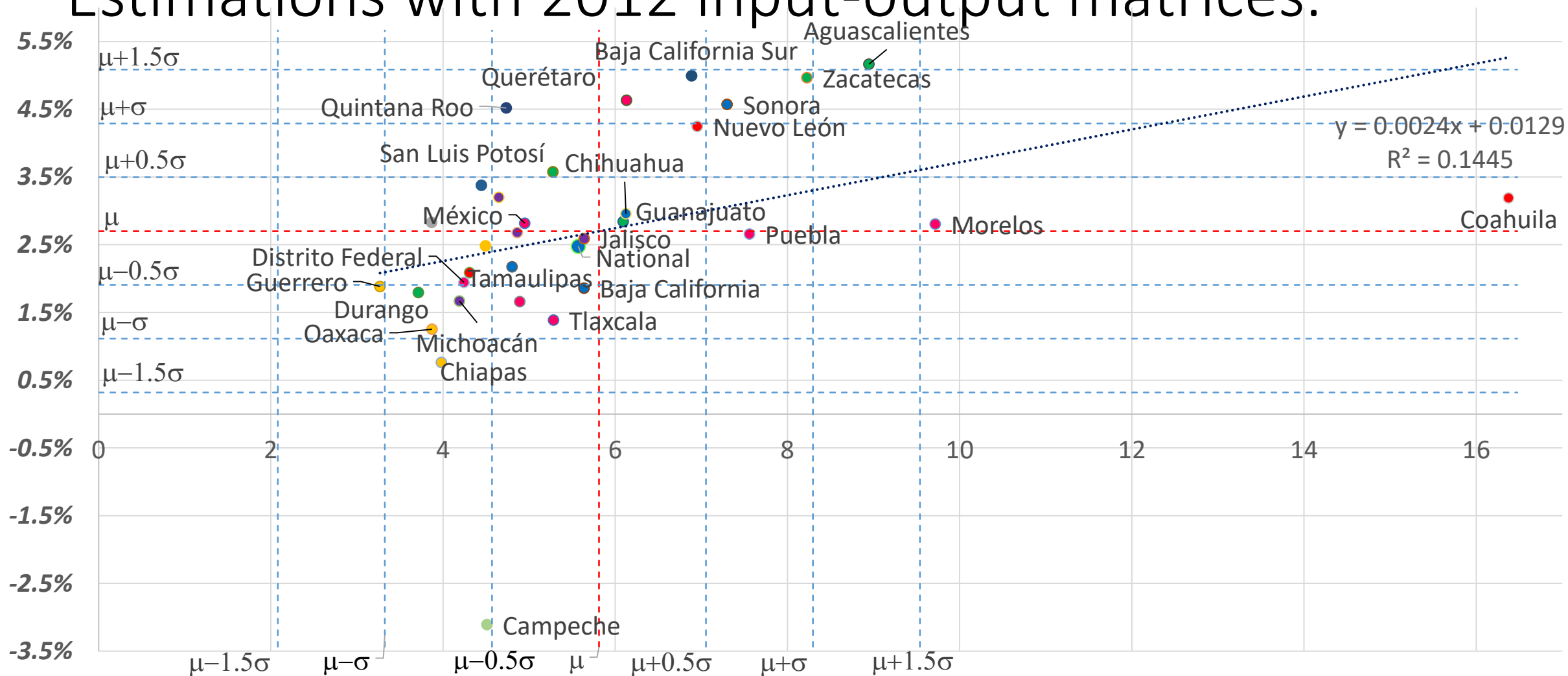
average real growth rate of gross production (%) and average standard deviation (%). 2003-2013.

assessment with input-output matrices from 2012



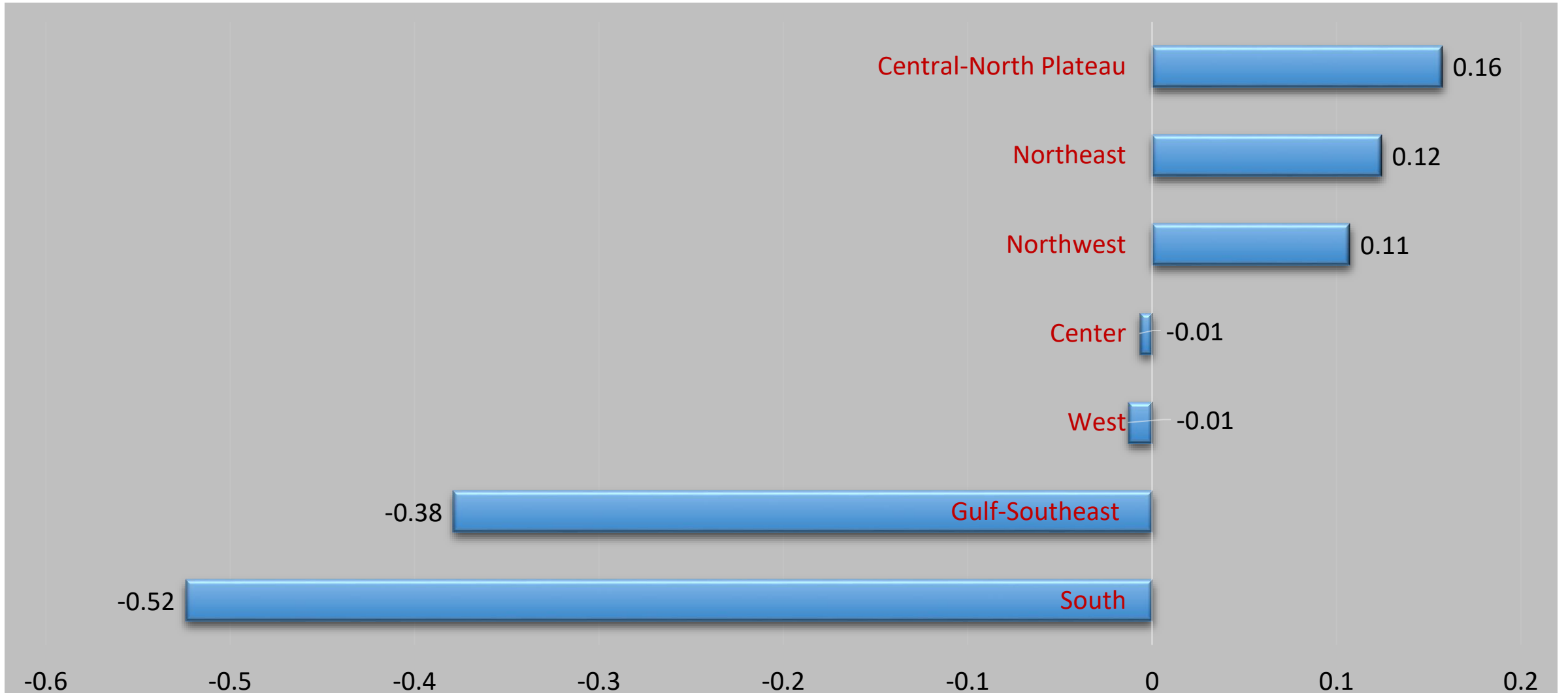
average real growth rate of gross production (%) and average standard deviation (%). 2003-2013.

Estimations with 2012 input-output matrices.



ECONOMIC PERFORMANCE OF THE REGIONS OF MEXICO.

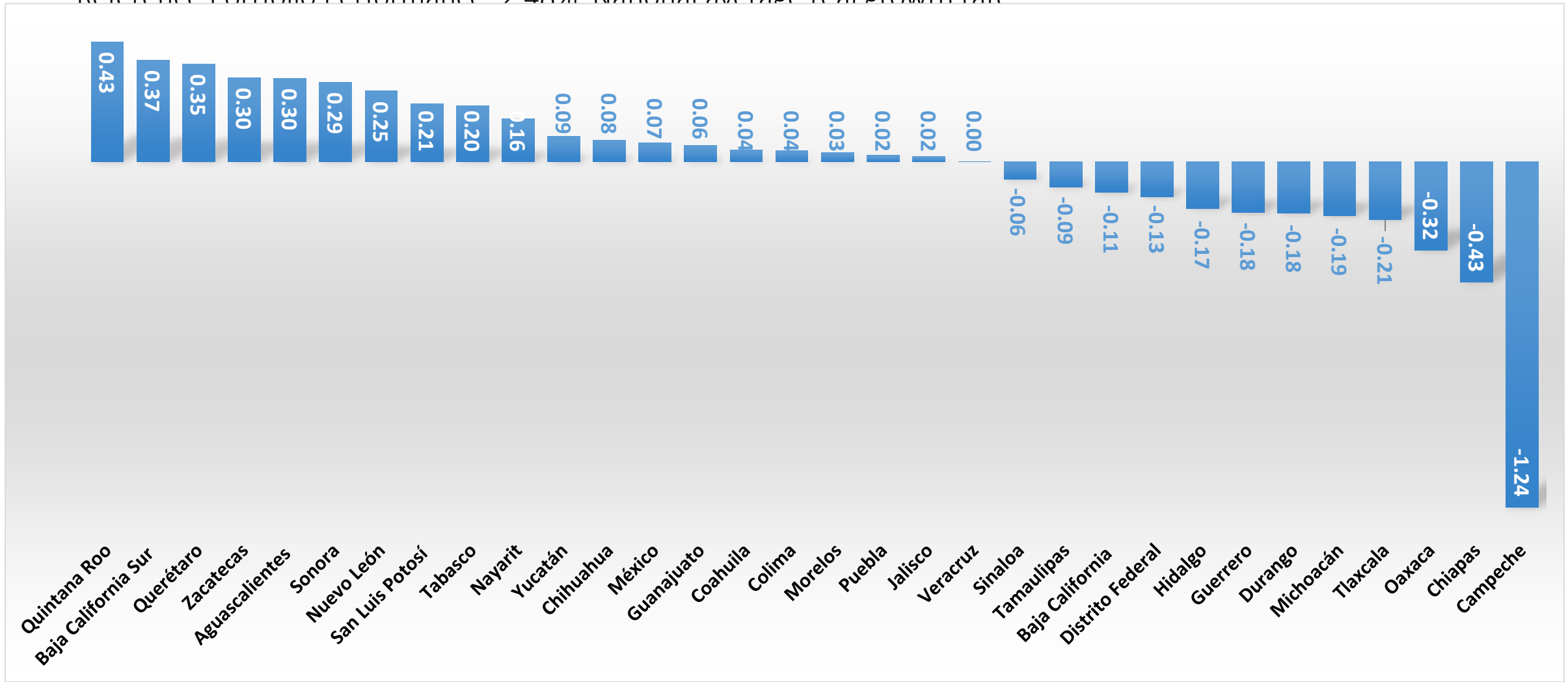
Sharpe coefficient.



ECONOMIC PERFORMANCE OF THE FEDERAL ENTITIES OF MEXICO.

Sharpe coefficient.

Reference Portfolio Performance: 2.48% National average real growth rate



Conclusions.

- Mexico trade liberalization deepening local economies specialization.
- Effects on economic performance, has been contrasting: Although some local economies reached acceptable rates of growth, those has been moderate in the majority. Higher specialization increased instability levels, particularly in states and regions in which industry of machinery and equipment has a strong presence.
- Dynamism of exports, changed the level and structure of final demand. Its sectoral concentration was accentuated and the volatility levels of gross production increased at three geographical levels: Country, mesoregions and federal entities.
- Changes in local inputs supply over volatility were differentiated: At national level, they had a positive contribution to offset the instability caused by transformations in final demand, Total variance fall (-0.9%).

Conclusions.

- Something similar happened in the Northwest and West regions.
- On Central and South regions also had a positive effect, but this was not enough to offset the increased instability related to structural changes in final demand, so the net variance increased. In the remaining regions (North-Central Plateau, Gulf-Southeast and Northeast), both factors combined to accentuate the instability of gross production.
- Overall level of volatility raised in 19 states; changes in the final demand amplified volatility in 20 and the growth of intermediate inputs coefficients produced a reduction on volatility in 17.
- Integrating indicators of economic performance (growth expectancy and standard deviation) with Sharpe ratio, North-Central Plateau region was the best evaluated (0.43), followed by the Northeast (0.124) and then Northwest (0.107). At the other end were the South (-0.524) and Gulf –Southeast (-0.379) regions.

Conclusions.

- At the state level, Quintana Roo (0.43), Baja California Sur (0.37), Querétaro (0.35), Zacatecas and Aguascalientes (0.3 in both cases) achieved the best results. On the opposite side stood Campeche (-1.24), Chiapas (-0.43), Oaxaca (-0.32), Tlaxcala (-0.21) and Michoacán (-0.19).
- Crossing these trends with previous research results, it can be concluded that the largest share of exports in gross production does not guarantee the best results. At mesoregional level, Northwest and Northeast regions, achieved export quotas higher than Central-North Plateau region (22.7, 20.4 and 16 percent, respectively) (Davila et al 2015), nevertheless, the latter recorded a higher economic performance ratio. When considering the national content exported in gross production, Central-North Plateau outperformed the Northwest region (10.2 and 8.8 in each case) (Davila et al 2015). Therefore, in order to obtain better economic performance, it can be more relevant; the net export content, sectoral diversity and highest density of local production chains.

Conclusions.

Research lines to deepen the study on performance of local economies in Mexico:

1. Replacing input-output Leontief basic model for extended ones, built with social accounting matrices. Adequate integration of income effects and changes on their distribution.
2. Applying constrained optimization techniques to run simulation exercises of different policy options impacts on economic performance, especially policies about diversification strategies based on cluster innovation approach.

Thank you!



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