

Needs Detection in Order to Increase Competitiveness on Regional Electronic Companies

Aguascalientes
Electronics Industry

May, 2013



**PROYECTOS
ESTRATÉGICOS**
Gubernamentales y de Negocios



Executive Summary

Global Macroeconomic Environment

In the last five years, the global macroeconomic environment has been affected by several economic crises. In 2011, the crisis on the Euro zone started product of the interaction with internal factors. On this economic environment, the International Monetary Fund (IMF) estimates that global economy may have moderate growth around 3.5% in 2013 and 4.1% in 2014, with an estimated growth of 1.4% in 2013 and 2.2% in 2014 for advanced economies, and an estimated 7.9% on 2013 for developing economies on Asia (China, India and the Association of Southeast Asian Nations (ASEAN - Philippines, Indonesia, Malaysia, Thailand and Vietnam).

For the United States there's a forecasted growth for about 2% in 2013. This estimated growth could be affected by federal budget cuts that will take effect decreasing the fiscal stimulus and also causing potential effects of contagion because of the European crisis. For Latin America the estimated growth is moderated, from 3.6% on 2013 and 3.9% on 2014.

About expectations for economic growth in Mexico, those are closely linked to the evolution of the U.S. economy, so the forecasted growth for 2013 is 3.5% and also for

2014, implying a slowdown compared to the final results obtained in 2012.

The Euro Zone continues to show a strong downside risk for the global economic growth, mainly because of the risks of prolonged stagnation, and also if they not follow and decisively maintain fiscal and financial reforms, as well as the implementation of actions to achieve greater integration of banking system and tax regimes.

International Electronics Sector Commerce

The world commerce volume registered a decrease in exports on advanced economies of 2.3% in 2012, mainly because of the crisis at the Euro zone, with moderate forecasted growth of 4.7% for 2013.

In 2012, manufacturing industry shows the highest growth on the non-pharmaceutical chemicals (20%), automotive and clothing (17%). Lower growth in exports was focused on integrated circuits and computers (1.9% and 1.3%, respectively).

Regarding exports of Office Equipment and Telecommunications (Computers, Telecommunications and Electronics) by certain economic regions, China stands out as the leading exporter with a share of 29.6% of total world exports, with a market



size of \$ 497 billion USD total, and positive percentage change of 11% compared with last year.

Mexico is ranked as the 9th exporter country of computers, telecommunications systems and electronics, with a share of 3.6% of world exports and a market value of 60 billion USD, ranked behind China, Europe, United States, Singapore, Taipei, Korea, Japan and Malaysia.

Summary of Exports and Imports of Mexico by General Classification, 2011. (Billions of Dollars)

Classification	Exports	Imports	Destination	Percentage	Percentage Change 2011
Office Equipment and Telecommunications	60	60	U.S.	74.1	-1
Computers	19	16	U.S.	91.8	17
Telecommunications	38	29	U.S.	98.6	-9
Electronic Components	3	15	U.S.	7.3	23

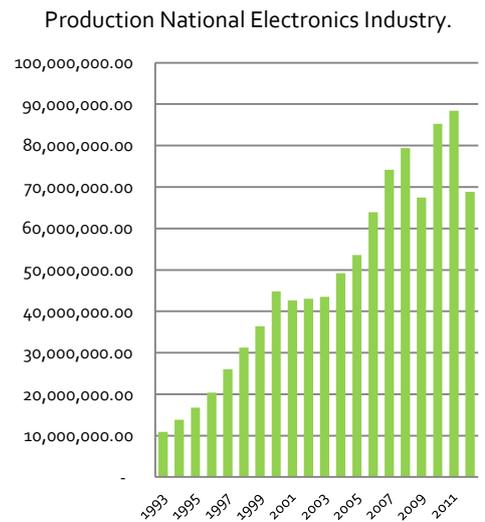
Source: Own elaboration with data from the World Trade Organization.

In terms of international commerce between regions and countries, Mexico has a significant participation in exports with 25% of telecommunication equipment and 22% of total computer imports requirement of the US.

International Electronic Industry Commerce

Broadly speaking, domestic electronics industry has presented a positive trend, mainly since NAFTA agreement, without being a

confirmation that this exempts from recent international commerce fluctuations and recent economic recessions, mainly because it is a highly integrated industry to production and global consumption.



Source: Bank of Mexico, September 2012 data.

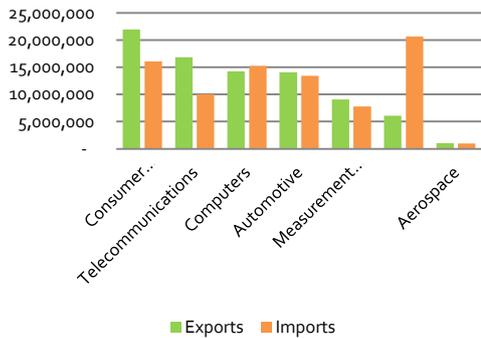
Our main exportation industry as a country is consumer electronics, mainly followed by telecommunications and computer industries.

In 2011, Mexico had an important participation on exports of televisions and computers. It is the biggest exporter on flat screens of the world, above Asian countries, and placed itself as the fourth largest exporter of computers worldwide.

In terms of trade balance, the electronic components industry shows a trade balance with a large deficit, importing a greater number of intermediate and capital goods for domestic production processes.



Exports and Imports by Sector Electronics Industries 2012.
(Thousands of dollars)

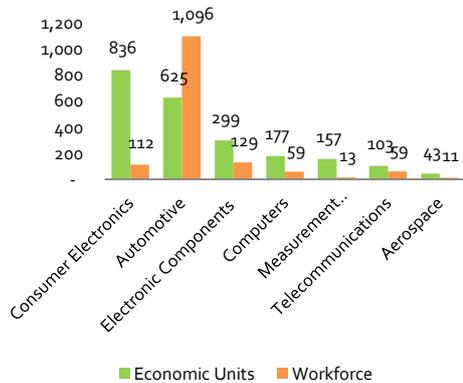


Source: Working Group Foreign Trade Statistics composed of the Bank of Mexico, INEGI, the Tax Administration and the Ministry of Economy.

Productivity Comparative

The consumer electronics industry has 836 nationwide economic units, generating more than 112,000 jobs, in second place is the automotive industry with 635 economic units, being a highly job generator industry, with more than 1 million. The aerospace industry has only 46 companies, generating more than 11,000 jobs (see Figure 1.54).

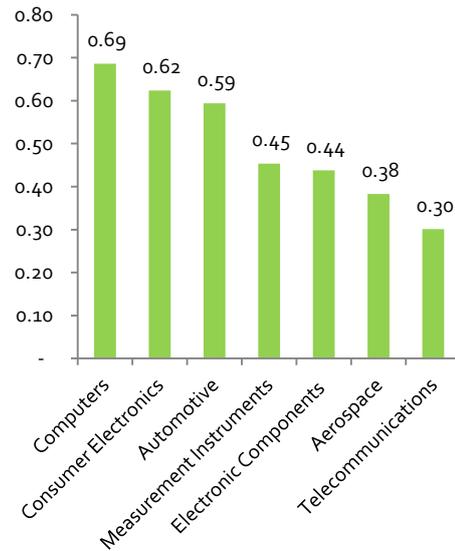
Economic Units – Workforce by industry.
(Economic Units - Thousands of Persons)



Source: 2009 Economic Census, INEGI.

The telecommunications industry has a better relation with intermediate consumption by industry; it requires less intermediate imported resources for their final production, followed by aerospace industry. Regarding industries with higher requirements of intermediate resources we found computing and consumer electronics.

Intermediate Consumption by Industry
(Relationship Intermediate Consumption / Production Total Brutal)



Source: 2009 Economic Census, INEGI.

The regional competitive pattern associated industries to electronics is characterized by higher productivity by the northern states of the country, along with some entities around center and west.

By the north of the country stands the state of Chihuahua, Nuevo Leon, Coahuila, Baja California and Tamaulipas. By the Western we can



find the state of Jalisco, and by the center the state of Aguascalientes, Mexico and Queretaro.

The remaining states present some lower level of productivity with a clear lag particularly at some southern and southeastern states.



The state of Baja California is a national leader in aerospace industry, electronics components, consumer electronics and measuring instruments. In automotive electronics we can mention the state of Chihuahua and Jalisco state in computer industry.

The competitive environment of the Electronic Industry from Aguascalientes State, recorded a pattern where we can find some outstanding industries as the electronic components industry, automotive electronics and computers.

Productivities Aguascalientes Electronics Industry

	Jobs	Productivity hand Artwork	Stock of Fixed Assets	Intermediate Consumption
Aerospace	-	-	-	-
Electronics	3,981	560	535	0.67
Automotive				
Electronics	4,100	356	393	0.71
Computers	1,820	-	-	0.54
Consumer electronics	-	-	-	-
Measuring instruments	8	28	13	0.66

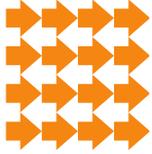
Source: Based on data from INEGI.

With information from the National Statistical Directory of Economic Units (DENUE) from INEGI, there were identified 11 companies in the state of Aguascalientes from electronics sector, also 8 electric sector companies, and 53 companies in the automotive sector.

Regarding the size of companies from the electronics sector, it is evident the preponderance of large companies in the industries of electronic components (2) and computers (1).

The rest of the companies have a smaller scale size, especially micro companies, with less than 10 employees, in the segments of transmission equipment, watches, measuring instruments, audio and video equipment.

A main conclusions of the local electronics industry is the high difference between the sizes of the companies, we can find large companies manufacturing computers and peripheral equipment and also electronic components (Contract Manufacturers), together with a small group of micro companies, which operate in isolation without a corporative strategy with a regional focus or also global, finding themselves immersed between cycles of a lack of fixed assets and also technological assets, low scale size and with a requirement for strategic alliances, adverse contexts in order to compete successfully in global markets.



Some relevant characteristics of the local electronics industry:

- 81% of the companies are micro, small and medium size.
- 7,854 jobs were created by the local electronics industry.
- 96% of jobs are generated by large companies.
- 49% are engaged in manufacturing processes and 29% on services.
- 16% is mainly involved in the electronic components industry
- 57% of companies reported Mexico as their main destination
- 21% of the production goes to the U.S., 8% to China and 3% to Europe.

SWOT Analysis

The main strengths that support the electronic industry of the state of Aguascalientes are those having to do with the availability of human resources.

The talent and creativity stands out as the main characteristic required on the human resource. Secondly, the growing market was defined and the actual infrastructure available in the industry. Contrasting, the weaknesses imply factors like insufficient quality of professionals, low organizational culture and the lack of companies (industry) availability in order to align their activities with academic institutions and research centers that can promote a high level of importations.

The main opportunities for the electronics industry are concentrated on the relationship between the horizontal integration of global capabilities and technological market globalization (off shoring trend).

Those opportunities, also, will be threatened by the increased international competition, mainly from emerging markets, adverse factors on the international economy and the low organizational level and the access of financing plans for businesses.

Strategic Plan Goals

- Move towards higher value and technological content in the global production chain;
- Strengthen productive links with the rest of the local economy;
- Achieve a stronger links between companies, Universities and local Research centers.

Strategies and Lines of Action

The strategies and action lines for the development of the electronics sector in Aguascalientes should focus on the following topics:

- Design and national product integration.
- Joining international networks.
- Strategic Plan for attracting Direct Foreign Investment (DFI).
- Companies Certification.



- Special Talent Management Systems.
- Consolidation of specialization opportunities.
- Supplier development.

1.1 Design product and national integration

Consolidate a local industry with design skills, develop and manufacture products and services of higher added value, registered in Mexico through the following procedures:

- 1.1.1 *Establish a Project Management Office*
- 1.1.2 *Acquire the technological infrastructure required*
- 1.1.3 *Access to commerce financing*
- 1.1.4 *Development of innovation projects*
- 1.1.5 *Registration of patents and trademarks*

1.2 Joining international networks

The electronics industry worldwide is characterized by its high integration into global value chains, that's why it is essential the execution of strategies and action plans in order to incorporate local industry into international networks.

- 1.2.1 *Business Networking Platform*
- 1.2.2 *Export Promotion*
- 1.2.3 *Marketing Channels*
- 1.2.4 *Efficiency in English Language Proficiency*

1.3 Strategic Plan for attracting Direct Foreign Investment (DFI)

Take advantage of opportunities beyond manufacturing, in order to attract in a selective way companies and/or projects, promote knowledge diffusion about technological topics, capacities and new products development.

- 1.3.1 *Procedures Simplification*
- 1.3.2 *Creation of Design Centers in Specialty Areas*
- 1.3.3 *Diagnostic of the investment costs of the state*

1.4 International Enterprises (Companies) Certification

Providing a positive environment in terms of regulations (in searching for harmonization with international standards), through adoption of international certifications on quality and environmental models.

- 1.4.1 *Certification on Quality and Environmental models*
- 1.4.2 *Creating a Center for Technology Standards*

1.5 Specialized Talent Management

Generate human resources into added value cycles as research and development, new product design, manufacturing strategic inputs, distribution and logistics, product customization, after-sale services and brand & market development.



- 1.5.1 *Training and certification of human resources*
- 1.5.2 *Development of Management Skills*
- 1.5.3 *Improve the link up with academic institutions and research centers*

1.6 Develop Local Specialty Areas

Develop the projects portfolio for vertical markets with a high priority for the local economy as automotive-electronics, agribusiness, robotic-mechatronics, as well nano - electronics in emerging markets, aerospace and aeronautics.

- 1.6.1 *Create an Electronic Design Center for Automotive Sector*
- 1.6.2 *Project of a Product Marketing Channel*
- 1.6.3 *Project of Service Development for Manufacturing Processes (Electronics-Robotics)*
- 1.6.4 *Nanoelectronics Design Center*
- 1.6.5 *Electronic Design Center Aerospace / Aeronautical*

1.7 Supplier Development

Developing suppliers with high levels of expertise in areas of design, engineering, development and advanced manufacturing of higher value added.

- 1.7.1 *Vertical Integration: Global Value Chains.*
- 1.7.2 *Horizontal Integration: associations and strategic alliances*

Quantitative Goals

In order to estimate the investments needed for development of the electronics industry in the state of Aguascalientes, the budget requirements in order to implement strategies and action lines proposed in the previous section.

Term	Projects	Contributions			Total
		Federal	State	Industry	
Short Term	10	9.1	1.9	4.3	15.4
Medium Term	10	16.3	1.6	6.3	23.8
Totals	20	25.4	3.5	10.6	39.2
Percentage		65%	9%	27%	100%

Source: Based on average prices of inputs and assumptions.

In the short term (1 year) there's a proposal about the implementation of 10 projects for a total amount of \$15.4 million pesos, with a contribution of \$9.1 million pesos from the Federal Government, through selected programs, \$1.9 million State Government and \$4.3 million private sector. In the medium term (1 to 3 years) proposes the implementation of 10 projects with a total of \$23.8 million dollars, \$16.3 million Federal Government State Government \$1.6 million and \$6.3 million private initiative.

Qualitative Goals

Short-term (2013 - 2014)

- Rely on strategies to provide training programs for human capital and research and technological development,
- Initiate the development of specialization areas in agribusiness, automotive-electronics and robotics.



- Increased expenses for research and technological development, supported with federal government funds.
- Increased patent registration associated with the implementation of R&D.
- Capabilities are promoted on Aguascalientes companies into the international market.

jobs (better paid than the high national average).

Long term

Local industry design and develop advanced manufactures in Aguascalientes, with a high percentage of local integration and use of local technologies.

Medium-term (2013 - 2014)

- 10 of the industry's leading companies have designing alliances, engineering and/or advanced manufacturing with international companies
- Investments are made into innovation projects.
- Industry and academic develop joint projects.
- Consolidation of the local industry as a leader in the quality and environmental models implementation.
- It strengthens the integration of different sectors of the electronics through a research network.
- There is a talent management system specialized for electronics sector, which integrates academia and research centers with industry.
- It has micro-clusters specialization on interest areas from foreign companies, internationally recognized for its innovation and advanced manufacturing processes.
- The increase in exports and supplier development program generate five thousand new