Chapter 15

Queretaro

Strengths
-Very high GDP growth rates
-Very high propensity of manufacturing firms to innovate
-High patenting activity, SNI researchers and number of scientific publications
-Good usage of national S&T programmes
-High rates of tertiary attainment and very good quality of education (PISA)
-Good regulatory framework and quality of life

Weaknesses
-High unemployment rates
-Very high intra-state disparities in terms of income distribution
-Low State Council expenditures in local S&T programmes

The state of Queretaro is located in the Centre-West meso-region, but is also part of the Centre region. Its capital city, Queretaro City, has been growing and developing rapidly over the last 20 years. Part of Mexico City's population and industrial decentralisation has relocated in this state. It is only the 27th largest state in surface area (about half the size of Slovenia), and with a population of 1.6 million inhabitants it is the 23rd largest state and the eighth most densely populated. Nevertheless, it does have 30% of its population living in rural areas, higher than the 23.5% average nationally, as most of its economic activity and population is encompassed in the metropolitan area of the capital city of Queretaro. The state population is growing at a markedly faster rate than the national average (2.3% *versus* 1% nationally), even if there is a slightly higher propensity for out migration to the US than nationally. It is at national averages in both schooling years and in the proportion of its population over 15 years that completed secondary schooling, however in terms of tertiary attainment rates it is well above average.

The state's GDP of USD 14.9 billion is 1.7% of the national economy (16th largest). Its GDP per capita is somewhat above national averages at USD 9 474 *versus* USD 8 241 (12th highest). The state of Queretaro has developed an industrial base, while in mining it produces gold. It also has *maquiladora* plants with exports of USD 250 million representing almost 10% of the state's total exports, however this is only a tiny fraction of the nation's overall *maquila* exports (0.29%). Queretaro has a higher than average Human Development Index for Mexico, this being an important indicator of general welfare, but has a much more unequal income distribution than most of Mexico (ranked 31st out of 32 states), especially in the difference in standards of living of the countryside and its cities.

Table 15.1. Socio-economic snapshot: Queretaro

Indicator	State value	Average or % of national	Rank	Indicator	State value	Average or % of national	Rank
Population (million)	1.6	1.6	23	GDP (USD million)	14 850	1.7	16
Area (sq. km)	11 658	0.6	27	GDP per capita (USD)	9 474	8 241	12
Population density[1]	139.7	97.9	8	GDP yearly growth 1996-2006 (%)[4]	5.1	3.6	2
Population 0-14 (%)	31.7	31.1	12	Primary sector (%)	2.7	5.5	26
Population 15-64 (%)	64.0	63.7	17	Industrial sector (%)	34.2	27.5	6
Population 65+ (%)	4.3	5.3	26	Services sector (%)	63.1	67.1	24
Rural population (%)[2]	30.1	23.5	13	Employment rate (%)	60.5	62.9	27
Population annual growth (2000-2005) (%)	2.3	1.0	4	Unemployment rate (%)	4.0	3.0	26
Yearly migration to the US[3]	24 682	2.4	21	Participation rate (%)	63.0	64.9	25
Population with at most lower secondary education (%)	64.4	66.9	20	Average yearly FDI 1999-2007 (USD million)	138	0.7	15
Population with upper secondary education (%)	16.5	16.7	16	Exporting *maquiladora* industry production (2004 USD million)	250	0.3	16
Population with tertiary education (%)	19.0	16.4	4	Marginalisation index	-0.14	0	17
Households with a PC (%)	24	19	5	Gini coefficient	0.685	0.616	31
Municipalities (number)	18	0.7	23	Human Development Index	0.809	0.803	13

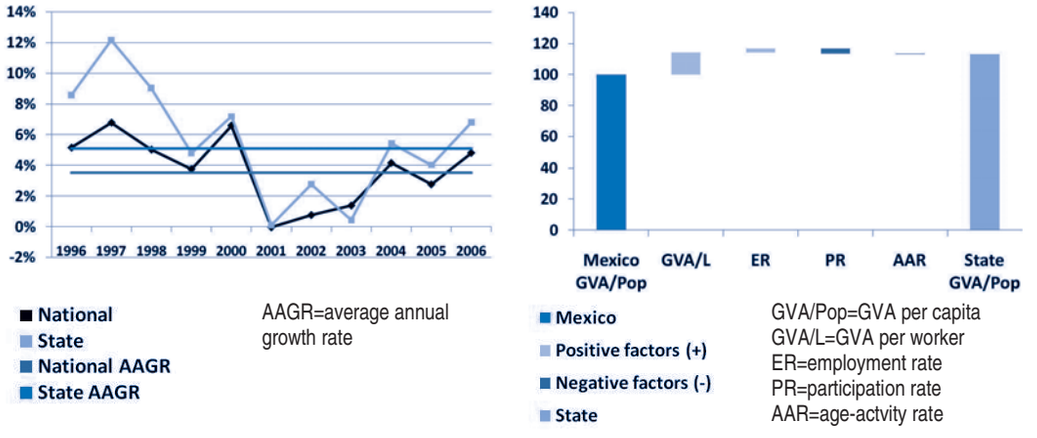
Notes: *i*) The population density calculation excludes the Federal District. *ii*) Rural population corresponds to the percent of population living in cities of under 2 500 inhabitants. *iii*) The yearly migration is as a percent of the state's population 15-64; the ranking is based on the absolute number of migrants. *iv*) The national average growth rate corresponds to the average growth rate of all states and not to the country's overall average annual growth rate.

Source: Latest year available in the OECD Regional Database (2008) for most variables. The Human Development Index is produced by the UNDP. Data for the rural population and households with a PC is from INEGI's 2005 Population Census. Number of municipalities, migration to the US, and economic breakout by sector are based on data from INEGI. GDP yearly growth calculated based on INEGI's System of National Accounts (SCNM). The marginalisation index is produced by the National Council of Population (CONAPO). FDI figures are from the Ministry of Economy. Data for exporting *maquiladora* industry production is from INEGI's Dataset of Economic Information (*Banco de Información Económica* – BIE). The Gini coefficient is from CONAPO 2000 (*La desigualdad en la distribución del ingreso monetario en Mexico*).

Economic growth

Figure 15.1. GDP growth and GVA per capita: Queretaro

growth (1996-2006) GVA per capita of state *versus* national average, 2004



Source: Figure Left: INEGI's System of National Accounts (*Sistema de Cuentas Nacionales de Mexico* – SCNM), 2008; Figure Right: OECD Regional Database, 2008.

Queretaro's GDP had an average growth rate of 5.1% from 1996 to 2006, well above the national average of 3.6%. The trend in most years is a higher rate than nationally, although this differential was greater pre-2000. Despite strong population growth, the state has nevertheless managed to increase its GDP per head above the national level increase over the period.

Queretaro has a GVA per head that is 12.9% higher than the national average. The state's higher GVA per worker, 14% higher than the national average, illustrates the benefit of having higher labour productivity. Queretaro has higher average scores in the quality of education, contributing to its human capital and the value added of the workforce.

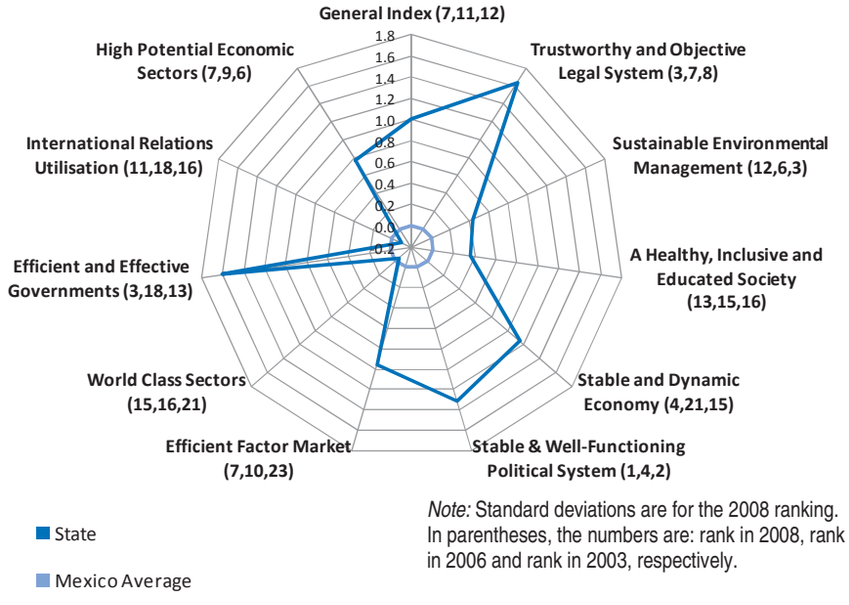
Queretaro has continued to improve its position on traditional competitiveness indicators. It is currently ranked seventh by IMCO, up from 11th in 2006 and 12th place in 2003. The state's score is one standard deviation above the Mexico average. Of the ten component indices, the state scores above the Mexico averages in eight, the other two being just below average. Areas of notable success and improvement concern governance, such as Stable and well functioning political system (top ranked), Trustworthy and objective legal system (third) and Efficient and effective governments (third). Categories with relatively lower values include International relations utilisation and World class sectors. Significant improvements are also noted in Stable and dynamic economy (up to position four from 15 in 2003). Among the state's cities ranked by IMCO are Queretaro (21) and San Juan del Rio (42). The state is ranked eighth on the Knowledge Economy Index.

Competitiveness indices

Figure 15.2. Example competitiveness rankings: Queretaro

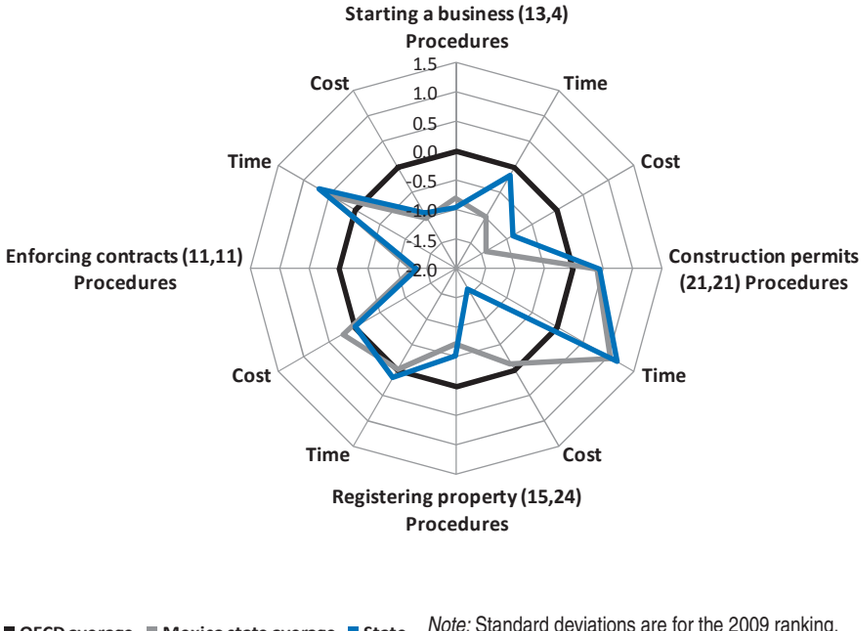
Standard deviations from the mean (0)

IMCO (7, 11, 12)



Note: Standard deviations are for the 2008 ranking. In parentheses, the numbers are: rank in 2008, rank in 2006 and rank in 2003, respectively.

Doing Business (17, 17)



Note: Standard deviations are for the 2009 ranking. In parentheses, the first number is the rank in 2009 while the second number is the rank in 2007.

Source: Figure Top: IMCO—*Instituto Mexicano para la Competitividad* (2003, 2006, 2008); Figure Bottom: World Bank's *Doing Business* (2007, 2009).

Queretaro performs only average with respect to Doing Business indicators, at 17th place in 2007 and 2009. It performs above the OECD average on four factors out of 12. Nationally, the state scores above average on eight of the 12 factors. While the state has ranked the same in the enforcing contracts (11th) and construction permits (21st) categories, it has gained with respect to registering property (up nine places to 15th) and slipped with respect to starting a business (down nine places to 13th). Improvements are needed for starting a business, especially with respect to time and cost. Given the relatively few number of municipalities in the state, greater success in these indicators should be achieved.

In terms of the federal SARE system to facilitate firm registration and development, three of 18 municipalities have a SARE office, Queretaro, Corregidora and San Juan del Rio. The latter two are encompassed in the metropolitan area of the capital city (where most of the population and economic activity is concentrated). Almost 65% of the population lives within a SARE municipality, however, increasing the coverage could help improve the performance on indicators related to starting a business.

Competitiveness committees and policies

- In order to improve the state's competitiveness, the local government has determined that resources levied with the 2% payroll tax are used to constitute a fund intended for infrastructure projects.
- The state has created the Programme for Strengthening Competitiveness which is aimed at SMEs and provides firm diagnosis, consulting, services for quality certifications, innovation and technological transfers, as well as services for linking firms, integrating value chains, and export and commercial promotion.

Industrial structure and clusters

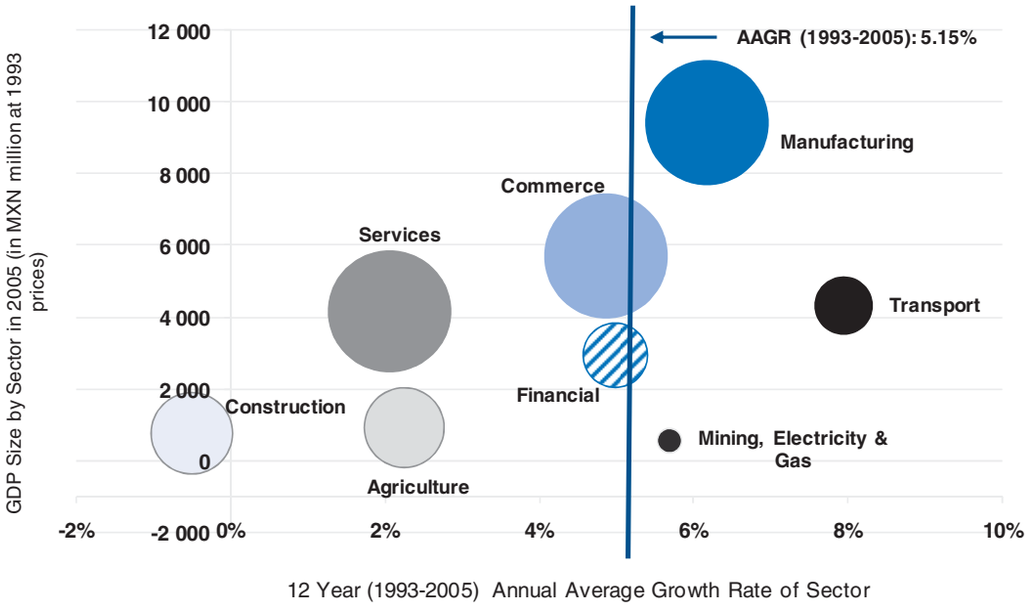
Table 15.2. Sectoral breakout: Queretaro

in %

	Agriculture Forestry & Fishing	Mining	Manu-facturing	Construction	Electricity Gas & Water	Commerce Restaurants Hotels	Transport Comm. & Storage	Financial Serv. Insurance & Real Estate	Communal Social & Pers. Serv.
State 2005	2.9	0.3	30.0	3.3	1.1	21.1	12.3	8.5	20.5
National 2005	3.4	1.5	17.9	5.4	1.4	21.2	10.6	12.0	26.7
State 1993	4.3	0.2	28.4	4.9	1.6	19.9	10.6	10.0	20.1
National 1993	6.3	1.4	19.0	4.8	1.6	21.8	9.3	12.9	22.9

Source: INEGI Dataset of Economic Information (*Banco de Información Económica* – BIE).

Figure 15.3. GDP by sector size and growth: Queretaro



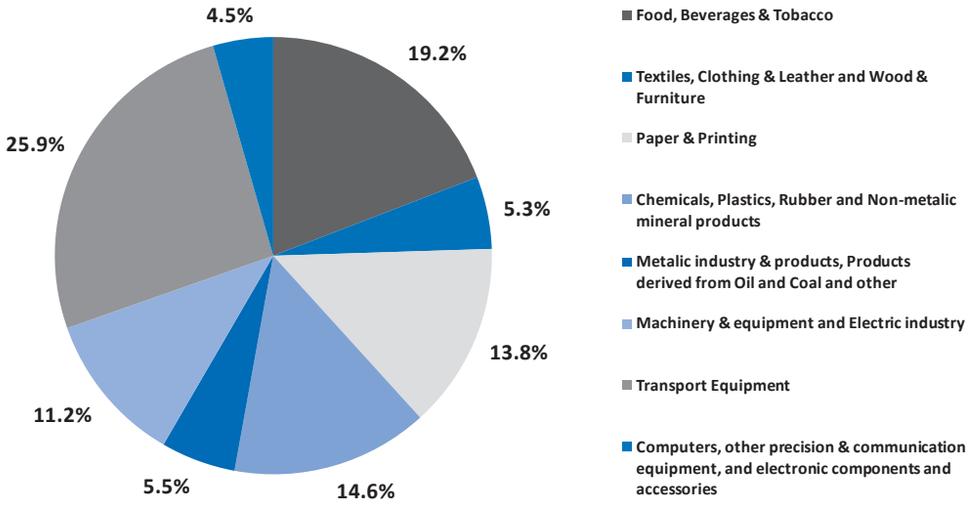
Note: The size of the circles represents the size of employment in each sector. The vertical axis corresponds to the size of GDP in MXN million at 1993 prices. The horizontal axis is the average annual growth rate of each sector. The state's overall average annual growth rate (AAGR) corresponds to the weighted average of all sectors.

Source: INEGI, Dataset of Economic Information (*Banco de Información Económica* – BIE) for the GDP annual data at 1993 prices and the absolute values by sector of economic activity; figures for sectoral employment from the National Survey on Employment (*Encuesta Nacional de Ocupación y Empleo* – ENOE 2005).

As observed in most states, the structure of the economy of Queretaro varied by sectors between 1993 and 2005. Agriculture, forestry and fishing reduced its share by a third, representing 4.3% of Queretaro's GDP in 1993 and 2.8% in 2005. Queretaro has a larger proportion of its population living in rural areas than the national average and even though it has developed some extensive agriculture, it is not a significant agricultural producer, except for red tomato for export and grapes.

The sector that had the largest annual average growth was transport, communications and storage with 7.9%, while manufacturing grew at an annual average rate of 6.2% during this period and became the largest employer with 23.2 of total employment. Also, commerce, restaurants and hotels (the second largest employer with 22.9% of the total) grew at an average 4.9%, agriculture, forestry and fishing at 2.3% and construction declined somewhat (-0.51%). The largest employer is manufacturing with 151 074 workers, followed closely by commerce, restaurants and hotels (where tourism plays an important role) with 149 150 and by communal, social and personal services (including government) employing 144 279. Queretaro's agriculture, forestry and fishing activity plays a minor role, employing less than 10% of the workforce with 62 579.

Figure 15.4. Breakout of manufacturing sectors: Queretaro



Source: INEGI Economic Census 2004 (Censos Económicos 2004)

Table 15.3. GVA by technology level: Queretaro

Percent of row total, 2004

	Low Tech		Mid-Low Tech		Mid-High Tech		High Tech		Total (USD million or number)
	State	Mexico	State	Mexico	State	Mexico	State	Mexico	State
GVA	35.2	32.1	14.2	24.7	45.5	31.6	5.1	11.6	2 219
Number of firms	51.1	61.8	43.1	35.3	4.8	2.1	1.0	0.8	3 459
Employment	42.3	44.1	21.3	25.0	31.7	21.5	4.7	9.4	94 364
Total assets	45.8	29.4	20.0	36.8	31.5	29.6	2.8	4.2	3 175
Investment	26.1	30.2	31.6	22.0	41.2	41.1	1.2	6.8	202
FDI (2007)	2.8	9.8	23.9	40.5	70.7	32.5	2.6	17.2	113

Note: Classification based on the OECD classification of industries by technology level.

Source: Ruiz Duran 2008 using data from INEGI 2004 Economic Census using OECD industry classification by technology level.

Table 15.4. Firm demographics: Queretaro

Firm Size	Employment	% of Employment	% of Employment (National Average)
Total	513315	100.0	100.0
Micro	259 619	50.6	54.8
Small	107 811	21.0	20.3
Medium	76 469	14.9	13.5
Large	69 416	13.5	11.5

Notes: **Micro:** Economic units from one to 15 employees in manufacturing; one to five in commerce and one to five in services. **Small:** Economic units from 16 to 50 employees in manufacturing, six to 15 in commerce and six to 50 in services. **Medium:** Economic units from 51 to 250 employees in manufacturing, 16 to 250 in commerce and 51 to 250 in services. **Large:** Economic units with over 250 employees in manufacturing, commerce or services.

Source: INEGI, National Survey on Employment (*Encuesta Nacional de Ocupación y Empleo* – ENOE) 2005.

Manufacturing, that had a significant percentage of the state economy already by 1993 with 28.4% of the state's GDP, increased its share to 30% in 2005. This is notably higher than the 17.9% national average share. The state has a diversified manufacturing structure with some well developed industries. The tradition started in the late 1940's when the textile, food processing and chemical industries began their development in the state. The major manufacturing sector is the transport equipment industry, where the car assembly sector is dominant. Queretaro has developed other industrial sectors such as: the domestic oriented food, beverages and tobacco industries and the chemicals, plastics, rubber and non-metallic minerals industries as well. Paper and printing are also important to the state's manufacturing base. Lately, Queretaro has also been developing high technology sectors, notably its aerospace industry with important FDI commitments for the next years. In 2003, *maquiladoras* represented almost 3.8% of the state manufacturing value added.

Queretaro's GVA has a strong representation in mid-high technology industries. While the state does have a slightly higher share of GVA in low technology industries (35.2% *versus* 32.1% nationally), it has a much lower share of mid-low technology industries (14.2% *versus* 24.7% nationally). Where the state stands out is in mid-high technology sectors, which represent 45.5% of the state's economy (*versus* 31.6% nationally). Queretaro's share in high technology industries is less than half the national share (5.1% *versus* 11.6%).

Queretaro has a roughly similar structure of employment by firm size relative to the national average. It does exhibit a slightly higher share of employment in large firms (13.5% *versus* 11.5% nationally). It also has a lower share of micro enterprises, albeit nevertheless large at 50.6% of employment (54.8% nationally).

Strategies and policies to support sectors and clusters

Sectors targeted:

- *Strategic:* IT, Aerospace, Telecom, Logistics (Source: *Proposal of Public Policies for the Economic Development of Queretaro*)
- *Other:* Electronics, Auto (Source: Ministry of Sustainable Development)

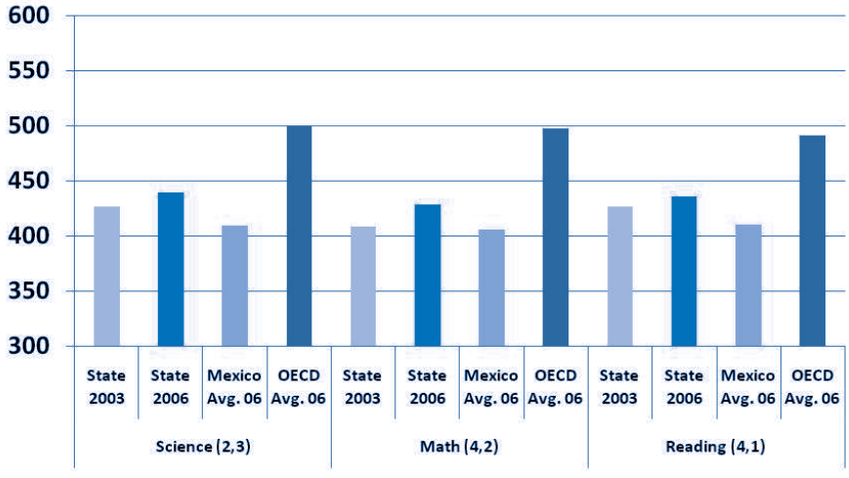
According to different sources, Queretaro's industrial and mining sectors had the following specific characteristics:

- Eighth largest auto part manufacturer with 4.1% of national total (Source: CONACYT 2006).
- Fourth national producer of gold (Source: CONACYT 2006).
- 17 industrial parks, cities and industrial corridors (Source: CONACYT 2006).
- FDI flows for all sectors in the state between 1999 and September 2008 of USD 1.468 billion for 0.7% of the national total (Source: Ministry of Economy 2008).

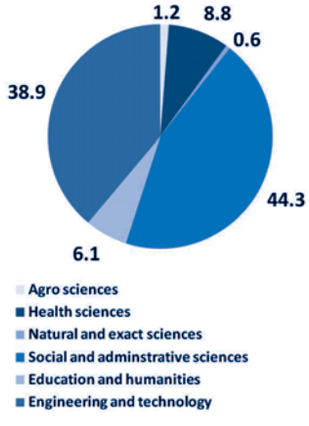
Innovation system

Figure 15.5. Education: Queretaro

PISA performance



Undergraduate education enrolment



Notes: The first number in parentheses is the ranking within Mexico in 2006. The second number is the changing in that ranking from 2003.

Source: Figure Left: Díaz G., María Antonieta, Gustavo Flores V. and Felipe Martínez R. *(Instituto Nacional para la Evaluación de la Educación* – INEE) (2007), *PISA 2006 en México,* Mexico, INEE, 2007.based on the OECD Programme for International Student Assessment. Figure Right: *Asociación Nacional de Universidades e Instituciones de Educación Superior* (ANUIES), 2004 data.

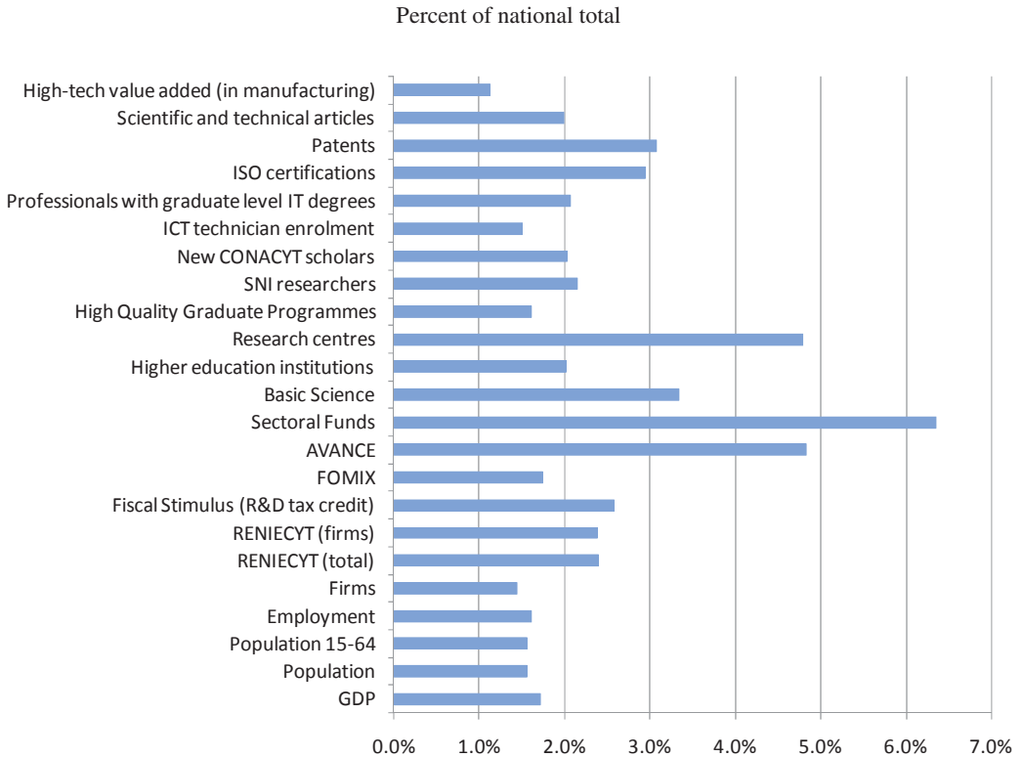
Queretaro has outstanding performance in the PISA (Programme for International Student Assessment) evaluations. It is second place in science, fourth in math and fourth in reading. Compared to the Mexico average, Queretaro improved its scores in the 2006 PISA evaluation from those observed in the 2003 evaluation, gaining three places in science, two in math and one in reading. If this trend continues, the state will be on a path to reaching the educational standards of higher income countries, as it is still behind the OECD average by two standard deviations in all three areas: science, reading and math.

Current enrolment for undergraduate degrees (in universities and technological institutes) in the state varies somewhat with respect to what is observed nationally. As is the case in most of the country (46.9%), Queretaro (44.3%) has a relatively high concentration of students in social and administrative sciences programmes. The state does have a noticeably higher share of students in engineering and technology related programmes with 38.9% of enrolment *versus* 33.4% nationally. It most also be noted that, similarly to what is observed around the country, Queretaro has a relatively small student population in natural and exact sciences.

Queretaro's GDP accounts for 1.7% of the national total, however it generally performs higher than its share in terms of scientific capacity. Particularly high is the state's Sectoral and AVANCE funds with 6.34% and 4.83% of national totals. Higher than expected is the number of patents with 3.1% of the national total. Also relatively high are ISO certifications (2.9%). This performance is no doubt supported by the existence of three CONACY public research centres in the state and nine total research centres according to ADIAT's directory. Close to what would be expected from the size of the state's GDP are the indicators related to FOMIX (1.75%), the number of high quality graduate programmes (1.6%), SNI researchers (2.1%), scientific and technical publications (1.98%) and new CONACYT scholars (2%). There are no innovation-related indicators which are significantly lower than would be expected in the case of Queretaro.

Regarding innovations among manufacturing firms, Queretaro's firms show far greater results than the nation as a whole. In terms of the creation of new products, the state ranks well above the national average, especially in terms of investment (47% *versus* 34% nationally). Investments for improvements of the working process are also higher than the national average by two percentage points. Process certifications are much better ranked than the nation as a whole, and investment in R&D also shows a higher level than the national average. In general terms, manufacturing firms in the state tend to perform well above the rest of the country in terms of innovation.

Figure 15.6. Innovation snapshot: Queretaro

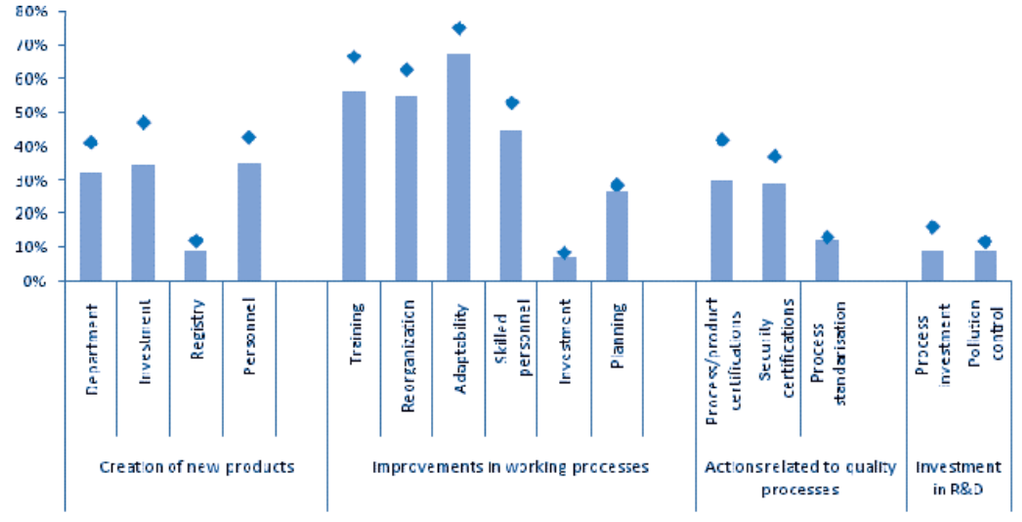


Notes: i) FOMIX data includes resources from 2002 through November 2008. *ii*) Research Centres reported by CONACYT through *Estado del Arte de los Sistemas Estatales de Ciencia y Tecnología 2006* based on ADIAT's Research Centre Directory and does not only include CONACYT Public Research Centres. *iii*) Scientific and technical articles correspond to the total for 1996-2005. *iv*) Patents correspond to the total for 2001-05. *v*) ISO certifications correspond to the total for 2000-06. *vi*) Basic Science resources correspond to the total for 2002-05. *vii*) Sectoral Funds correspond to the total for 2002-06. *viii*) AVANCE resources correspond to the total for 2003-06. *ix*) FOMIX data for Puebla and Chihuahua includes resources at the municipal level for the City of Puebla and Ciudad Juarez, respectively.

Source: Latest year available data from CONACYT for most variables. Latest year available data in the OECD Regional Database (2008) for GDP, Population, Population 15-64 and patents. Employment and Firms from INEGI Economic Census (2004). SNI Researchers, New CONACYT Scholars, ICT Technician Enrolment, Professionals with graduate level IT degrees and ISO Certifications obtained from INEGI, available at www.inegi.org.mx. Data for Scientific and technical articles from *Fundación Este País* (2007). High-tech value added figures from Ruiz Duran (2008) based on INEGI Economic Census (2004).

Figure 15.7. Innovation by manufacturing firms: Queretaro

% of firms reporting an innovation-related action or investment



Source: INEGI, Innovation and Research Module of the 2004 Economic Census.

State Science and Technology Council and other major innovation initiatives

- The state has put increasing attention to transitioning to higher technology sectors and is currently developing an aerospace cluster around the state's airport based on the presence of two large multinational firms.
- The state shows low levels of S&T spending via the S&T Council resulting in reduced opportunities for place-based polices.
- The state has constituted an independent local fund aimed at promoting innovation which is very similar to FOMIX but does not depend upon CONACYT's calls for proposals.

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