Regional System of Innovation: the Andalusia case

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Based on Alejandro Tosina, Rafael Zaballa and Juan Polo (MEGIN).
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GDP per capita and Employment

GDP per cápita (1995-2008)

Unemployment rate vs UE and Spain (1996-2010)
Andalusia economic evolution

GDP per capita (UE=100)

% Population over 16 with Secondary Education

Merchandising Exports (1981=100)

% Population over 16 with Secondary Education

Source: IEA; INE; Eurostat; OMC.
Sector Composition

Tourism as principal economic activity
Strong linkages between fishery and agriculture
Limited industry and transformation (naval and aeronautic)

Source: Economic Report of Andalusia 2010
Andalusia - Context

**IMPORT / EXPORT**
Progressive internationalization in recent years
Export growth 446.5% since 1990 (compared to 326% of world trade, 211.2% U.S.)
Focus Home = EU exports, 45% of imports from OPEC, 30% OECD
Business promotion offices in different countries

**ANDALUSIA ENTERPRISE**
Business network even disjointed, but more diverse and constantly evolving
2 ° ACs in total number of companies (~ 450,000), 50% self-employed and micro
Growth in recent years major companies 50 -200 employees
Special importance of social economy: 8,469 enterprises (4,764 cooperatives and
3,705 employee-owned companies), 354,000 members, 73,128 employees, 14% of GDP
Major business organizations: Confederation of Employers of Andalusia (CEA),
Confederation of Organisations for Social Economy of Andalusia (CEPES-A)
R&D and Innovation

Ten public universities, 25,000 researchers (15,000 doctors), 2,000 research groups.

European convergence process

• 1500% growth in R & D, compared to 200% EU (1987-2010)
• Bibliometric production tripling between 2000 and 2009

Technological Network of Andalusia, led by Technopolis Seville and Malaga PTA.

• 11 technology parks,> 1000 companies installed with 4 billion euros global turnover
• 21 technology centers, 16 foundations and research centers and technology
• Eight Scientific Facilities Technology (ICTS)
• Health Technology Park of Granada (Biomedicine, Stem Cell Bank, Center for Genomics and Cancer Research, Research Center for Innovative Medicines)

Leader in renewable energy

• 40% of the total use of biomass
• Europe's leading photovoltaic solar tower.
• Research on solar thermal technology Plataforma Solar de Almeria (30 years activity)
R&D in Andalusia

R&D Expenditure - Base 100 (1987-2010)

Clear convergence in R & D efforts with other national and EU

Excessively based on Administration and University vs EU

Strong momentum since 2004 with the creation of the Ministry of Economy, Science and Business Innovation

Secular increase in private R & D ratio, although differential persists EU

Source: Economic Report of Andalusia 2010
Innovation in Andalusia

~ 1 Bill innovation expenditure Euros

4th Spanish region in Innovation: 3.307 firms, 11% national total in 2009

Higher proportion of business expenditure <250 employees, compared the national average (51.3% vs 41.1%)

R&D expenditures balanced vs other expenses

R&D ratio less than national average (47.6% vs 55.8%)

Source: Economic Report of Andalusia 2010
RIS Andalusia

Spain = 0395
Andalucía=0.268

Innovation Performance (IUS) – ProInno Europe 2010
Innovation Plan of Andalusia (PAIDI)


This is the fifth version of the Innovation Programs implemented since 1984.

**Mission:** To promote strategies and actions, based on the R & D, aimed at increasing citizen welfare, sustainable economic development and improve social cohesion in Andalusia.

**Objectives**

- New planning framework for policy research and technological development for innovation.
- Improving business competitiveness, quality job creation, social return of science to contribute to social, economic and cultural development of Andalusia.

**Strategic Lines**

Competitive research, Human and social capital, Research capacity, Entrepreneurial culture, Support for business R&D projects, Innovation, Knowledge transfer, Business involvement in Regional Innovation System.
PAIDI Agents

Innovation Agency (IDEA) - the main instrument
• Impulse clusters of Andalusia, attracting investment and businesses
• Strategic management of investments, projects and performances unique in troubled companies
• Launch and management of the Order of incentives for R & D Business Development
• Framework and mechanisms for enhancing high-growth companies, development and improvement of productive land and infrastructure, launch Invercaria (venture capital).

Technological Network of Andalusia (RETA)
• Cluster Network Technology (companies, institutions or technological parks and technological RETA interacts with the environment enterprises to encourage innovation and competitiveness

Technological Corporation of Andalusia (CTA)
• Development / project financing companies - research groups with technological risk in defined strategic sectors.

Center for Innovation and Technology Transfer (CIT Andalusia)
• Promoting knowledge transfer and participation of companies and groups of I D in EU programs

Andalusian Agency for Quality Assessment and Accreditation Univ (AGAE)
• Improvement and quality assurance of the Andalusian Universities and Research.
The triple helix and the virtuous circle

**FIRM**
- Activity: Innovation
- Inputs: Capital, Work, technology
- Outputs: Products, Service

**UNIVERSITY**
- Activity: Knowledge, Education
- Inputs: technology (knowledge)
- Outputs: Services

**GOVERNMENT**
- Activity: Facilitate, promotion
- Inputs: technology (knowledge), Capital
- Outputs: Services, Taxes

Inputs:
- Capital, Work
- Technology

Outputs:
- Products, Service
- Services

Excedent: Service (training)
The triple helix and the virtuous circle: The Firm

**Low effort and performance on R&D, Innovation and Cooperation**

*More centered on Process Innovation*

- MM 18.4 Euros Exports 2010 (+2.9% s/2007)
- 2010 90.2% export share, trade deficit 3.2%
- IPI 2010 74.50 (-21% s/2007)
- 2.1418 GDP / wage earners (+0.06% / 2007)
- Corporate mortality rate > 20% in 2010

- % Venture capital / GDP (ND, Spain = 0.07%)
- 434 M Euros IDE 2009, +262 % 2010
- 802 firms with R & D in 2009 (2.86%)
- EIN 2007-09: 4,828 (18%)
- I. Product: 1866, I. Process: 3953
- 6,472 companies with non-tech innovation (23.10%)
- 352 patent applications in 2009
- 827 companies cooperating with each other

- 1,000 M Euros / year innovation costs
- 31.9% s / total R & D expenditure in business and IPFSL (478 M Euros)
- EJC 6093 in R&D
- 0.69% innovation intensity (expenditure / turnover) (year 2009)
The triple helix and the virtuous circle: Government

**Big effort to generate systemic relationships: resources and institutional setting**

*Low interaction with the private sector*

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**Inputs - Technology**
- 6,099 person R & D Admin (2009)
- R & D Expenditures 2009 390.8 M Euros
- National budget allocation 427.3 M Euros (PNIDI) to companies and Andalusian Universities
- 544.4 M Euros PAIDI budget

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**Outputs**
- 2351 Publications (2010)
- 6 MU sales contract R&D (2010)
- PAIDI - 12 sector programs
The triple helix and the virtuous circle: university

Very central actor in the innovation process
Low interaction with the private sector

Inputs
• Technology
• 11.679 people R&D 2010
• R&D expenditures University: 683M Euros in 2010

Outputs
• 110 patents filed 2010
• ISI papers 5930 2009
• 31220 alumni 2009
• 7948 doctors 2008
• Techno Firms in 2009: 41 University spin-off

FIRMS
• 226,000 students enrolled
• 249 projects encouraged excellence, 48MEuros
• Research groups 2.044

GOVERNMENT
The triple helix and the virtuous circle

*Government and University (public sphere) do not find echo in Firms (private sector)*

- OTRIS 9, 1494 contracts, 90 M Euros
- FP7 161 projects, 56.1 M Euros
- 3500 Univ contracts - companies, 89.9 MU.
- University Projects: 77 international

- 83.3 M Euros national and local public funds for R&D companies (2009) (18.1 MU national)
- EU funds for R&D enterprise internal 4.4 M Euros (2009)
- Framework Programme to Andalusian companies = 12.5 MU
- Funds innovative activities to 768 companies (14.5%) (2007-09)
- Cooperation Org. 158 companies public in innovation (3%) (2007-09)

- 209 people employed in public Financing R&D groups Univers. 12.4 M Euros
- Incentives EU mobility and development 428,000
- Govt Funding. Universities Spanish to MU 36.9
Firm’s (no clear) trends

Nº Firms with Innovative Activity

Intensity of Innovative Firms

Innovation Expenditure

Crisis? What Crisis?

Fuente: ICEA
Funding activities: from government to firms

The available funds exceed the demand of entrepreneurs

Funding for R&D projects with public funds is uneven

Fuente: CDTI
University

Ascending trend

R&D University personnel

 Nº of ISI Documents

University R&D Expenditure (millions €)

Patent Applications

Fuente: Informe PAIDI
University

Positive trend

**Nº of FP7 Awarded Projects**

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**Nº Firms.- University Contracts**

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**Firms-University Contracts (1000 €)**

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**University**

Positive trend

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Fuente: Informe PAIDI, ICEA
Support for R&D from the administration grows

Fuente: Informe PAIDI
Conclusions

- Big public effort in supporting structures for innovation
- Growing R&D activity in R&D from Universities (Triple Helix)
- Growing R&D collaboration between Firms and University (Triple Helix)
- Innovative firms activity without a clear tendency (Triple Helix)
- Growing firms R&D activity, but departing from very low values
- Low private participation in R&D. Low relative exporting capacity
- Important impact of the crisis
- Initiatives producing isolated impact with limited spillovers to the rest of the structure

What should come first?

- The formation of public capabilities?
- The generation of private demand to use it?