



**Advancing Knowledge-Intensive Entrepreneurship &
Innovation for Economic Growth and Social Well-being in Europe**

D2.2.9
**Innovation systems and knowledge-
intensive entrepreneurship: Poland**

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Issues addressed

- **National Innovation System and Knowledge-Intensive Entrepreneurship in Poland: Overview**
 - R&D spending and innovation
 - Cooperation in innovation process
 - Venture capital
- **IT and machine tool industries**
 - Overview of trends and sources of competitive advantage
 - Market, technological and institutional opportunities

NATIONAL INNOVATION SYSTEM AND KNOWLEDGE- INTENSIVE ENTREPRENEURSHIP IN POLAND: OVERVIEW

R&D spending and innovation

- Percentage of firms stating that they have recently introduced product or process innovations is low and falling
- Polish GERD as a percentage of GDP is low (under 1%) and declining for most of the past two decades, but this trend seems to have reversed lately
- The state share is high, with about two thirds coming from the state and one third from industry; but businesses are beginning to spend more on R&D

Who do firms cooperate with in innovation?

- Other firms (particularly supply chain partners) dominant partners in innovation process
- S&T sector of secondary importance, but still a significant partner
- In particular, universities are increasingly important in the innovation process, especially for medium-sized and large firms (eclipsing industrial R&D institutes specifically designed for technology transfer)
- Small firms interact with the S&T sector much less frequently than do medium-sized and large firms
- High level of internationalization of the innovation process, even among small firms (foreign partners of all types are mentioned by many firms of all sizes)

Venture capital

- Problems with exit opportunities (relatively shallow capital market); in spite of this Poland compares favorably with benchmark countries

Venture Capital compared to credit and publicly traded equity in Poland

	Domestic credit to private sector (% of GDP) (2007)	Stocks traded (% of GDP) (2007)	Venture capital (% of GDP) (2007)	Venture capital availability (2009–10 weighted average)
Poland	39.44	19.88	0.03	2.70
Czech Republic	47.95	24.07	0.00	2.60
Latvia	88.67	0.49	na	2.20
Germany	105.49	101.42	0.05	2.80

Source: World Bank for domestic credit and stocks traded; Eurostat for venture capital as a percentage of GDP; World Economic Forum (2010) for venture capital availability

IT AND MACHINE TOOLS

Machine tools

	2002	2003	2004	2005	2006	2007
Number of persons employed per enterprise	18	16	14	13	14	14
Share of employment in manufacturing total	0.7	0.6	0.5	0.5	0.5	0.5
Number of enterprises	874	843	905	969	946	1031

Software

	2002	2003	2004	2005	2006	2007
Number of persons employed per enterprise	3	3	3	3	3	3
Number of enterprises	24437	25998	27536	28254	29026	35288

Source: Eurostat

Share of R&D employment in the number of persons employed (%)

Machine-tools

	2005	2006	2007	Avg (97-07)	avg all EU	avg CEEC	avg west Europe
EU	-	-	-	-	3.0	2.5	3.4
Czech Republic	3.2	2.9	2.8	2.8	-	-	-
Hungary	3.7	4.4	4.1	3.3	-	-	-
Poland	1.3	1.1	1.4	1.3	-	-	-

Software

	2004	2005	2006	2007	Avg (97-07)	avg CEEC	avg West Europe
EU	-	-	-	-	-	2.71	12.51
Czech Republic	6.60	8.06	7.72	7.07	5.45	-	-
Hungary	0.88	1.26	1.79	2.23	1.35	-	-
Poland	0.90	1.38	1.50	1.47	1.32	-	-

Source: Eurostat

Share of R&D expenditure in value added

Machine-tools

	2005	2006	2007	Avg (98-07)	avg all	avg CEEC	avg west Europe
	-	-	-	-	4.2	2.7	5.6
Czech Republic	4.8	3.1	3.0	3.6	-	-	-
Hungary	7.8	5.3	9.8	3.9	-	-	-
Poland	1.0	0.6	0.7	0.8	-	-	-

Software

	2004	2005	2006	2007	avg	avg all	avg CEEC	avg west Europe
	-	-	-	-	-	6.2	2.6	8.9
Czech Republic	5.9	6.5	5.5	5.1	5.1	-	-	-
Hungary	1.0	0.9	1.6	1.6	1.2	-	-	-
Poland	0.7	1.7	1.6	1.6	1.4	-	-	-

Source: Eurostat

IT

Market opportunities

- **Domestic market focus**
- **Export limited to a small number of large firms; these firms have also started building foreign networks of subsidiaries (including acquired ones)**
- **Industry heavily dominated by “knowledge customizers” not “knowledge creators”**
- **Competitiveness as location for outsourcing highly dependent on exchange rate (Polish programmers are cheap, but not cheap enough for that to be irrelevant)**

Technological opportunities

- **Because of knowledge customizer status, role of technological opportunities limited**
- **Product innovation is almost always evolutionary and incremental – firms have few products and most new development consists of upgrades**
- **Low R&D compared to European benchmarks**
- **However, IT firms much more innovative (new products and services) than Polish manufacturing – especially in medium-sized category (54% vs 33%)**
- **Statistical data show contracts for innovation-related cooperation more frequent than for comparably sized Polish firms**
- **Suppliers and customers most frequent partners**
- **Universities very seldom partners in the past (and this was reflected in remarks of experts interviewed), but this has changed in last 5 years: universities now one of the four most frequently named partner types**

Institutional opportunities

- **Regulatory burden not problem; some regulations (e.g. regarding security) stimulate development of industry**
- **Public procurements: only criterion is price**
- **Also: closed code remains property of the supplier, so public sector customer is condemned to continue the relationship even if performance is unsatisfactory**
- **Software firms received public financial assistance for innovation much more often than Polish firms in general in comparable size category**
- **Gap between this industry and larger sample due to much higher level of funding from European Union**
- **As for larger sample, funding from Polish sources is marginal**

MACHINE TOOLS

Entrepreneurial opportunities

- **Market opportunities**

- Specific to industries being supplied
- Difficult to start new firms because capital intensity is an entry barrier

- **Institutional opportunities**

- Technology parks and incubators irrelevant; some presence in industrial parks
- Machine tool firms received public financial assistance for innovation more often than Polish firms in general
- Unusually, central government is a much bigger source of this funding than the European Union

Entrepreneurial opportunities (cont'd)

- **Technological opportunities**
 - **Specific to industries being supplied**
 - **Low R&D compared to European benchmarks**
 - **But innovativeness higher than comparably sized Polish enterprises**
 - **Statistical data show contracts for innovation-related cooperation more frequent than for comparably sized Polish firms**
 - **Customers and suppliers most frequent partners (in that order)**
 - **As in case of It, universities have recently assumed important partnership role (third most frequently named type of partner)**