



**Luxembourg is a Strong Innovator.** Over time, performance has increased by 1.4% relative to that of the EU in 2010.

## Innovation system

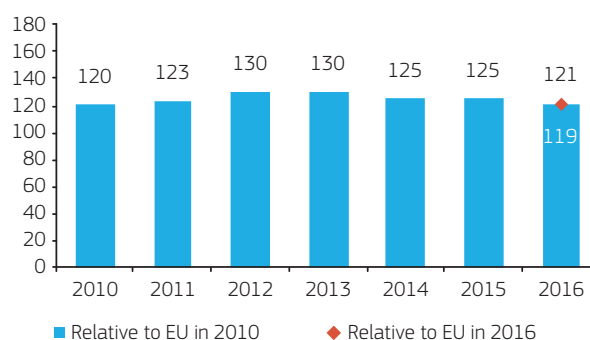
Relative strengths of the innovation system are in Attractive research systems, Innovation-friendly environment, and Intellectual assets. Relative weaknesses are in Linkages, Finance and support, and Sales impacts.

## Structural differences

Notable differences are a smaller share of employment in Agriculture & Mining, in Manufacturing and in High and Medium high-tech manufacturing, a larger share of employment in Knowledge-intensive services and in Public administration, a larger share of SMEs in turnover, a smaller share of large enterprises in turnover, a larger share of foreign controlled enterprises, a higher number of Top R&D spending enterprises but a lower average R&D spending of these enterprises, a smaller share of enterprise births, higher buyer sophistication, higher GDP per capita, a higher growth rate of GDP, a higher growth rate of population, and higher population density.

	LU	EU
<b>Structure of the economy</b>		
Composition of employment, average 2011-15		
- Agriculture & Mining (NACE A-B) (%)	1.3	5.1
- Manufacturing (NACE C) (%)	5.4	15.6
<i>of which High and Medium high-tech (%)</i>	17.9	36.4
- Utilities and Construction (NACE D-F) (%)	6.9	8.6
- Services (NACE G-N) (%)	68.3	63.6
<i>of which Knowledge-intensive services (%)</i>	73.5	58.0
- Public administration, etc. (NACE O-U) (%)	18.1	7.1
<b>Business indicators</b>		
Composition of turnover, average 2011-2014		
- Micro enterprises (0-9 employees) (%)	14.8	17.3
- SMEs (10-249 employees) (%)	57.3	38.0
- Large enterprises (250+ employees) (%)	27.9	44.1
Share of foreign controlled enterprises, 2014 (%)	29.47	1.18
Top R&D spending enterprises		
- average number per 10 mln population, 2011-15	388.7	29.9
- average R&D spending, mln Euros, 2011-15	35.4	165.8
Enterprise births (10+ empl.) (%), avg 2012-14	1.1	1.5
Buyer sophistication 1-7 (best), 2013-14	4.7	3.6
Ease of starting a business, Doing Business 2017	68.8	76.5
<b>Socio-demographic indicators</b>		
GDP per capita, PPS, avg 2011-13	67,200	25,400
Change in GDP between 2010 and 2015, (%)	15.2	5.4
Population size, avg 2011-15 (millions)	0.5	505.5
Change in population between 2010 and 2015 (%)	12.1	1.1
Population aged 15-64, avg 2011-2015 (%)	68.9	66.1
Population density, average 2011-15	210.2	116.4
Degree of urbanisation, average 2011-15 (%)	62.0	74.4

Values in green show performance above 120% of EU, values in red show performance below 80% of EU.



Luxembourg	Performance relative to EU 2010 in		Change 2010-2016
	2010	2016	
<b>SUMMARY INNOVATION INDEX</b>	120.0	121.4	1.4
<b>Human resources</b>	128.5	147.0	18.7
New doctorate graduates	46.2	62.4	16.3
Population with tertiary education	171.7	219.7	48.0
Lifelong learning	176.6	154.2	-12.6
<b>Attractive research systems</b>	181.2	215.1	54.0
International scientific co-publications	280.5	372.4	291.9
Most cited publications	83.2	115.8	32.6
Foreign doctorate students	231.4	231.4	0.0
<b>Innovation-friendly environment</b>	174.7	172.9	-1.9
Broadband penetration	144.4	233.3	88.9
Opportunity-driven entrepreneurship	196.1	130.2	-65.9
<b>Finance and support</b>	114.5	69.3	-45.3
R&D expenditure in the public sector	46.7	85.8	39.1
Venture capital expenditures	200.7	48.5	-151.7
<b>Firm investments</b>	68.4	81.5	13.1
R&D expenditure in the business sector	58.8	55.4	-3.4
Non-R&D innovation expenditures	24.5	4.9	-19.6
Enterprises providing ICT training	114.3	171.4	57.1
<b>Innovators</b>	135.2	122.6	-12.6
SMEs product/process innovations	127.3	107.8	-19.5
SMEs marketing/organizational innovations	145.2	150.1	4.9
SMEs innovating in-house	153.6	109.1	-23.5
<b>Linkages</b>	69.7	44.2	-25.4
Innovative SMEs collaborating with others	111.7	80.0	-31.6
Public-private co-publications	92.8	42.4	-50.4
Private co-funding of public R&D exp.	15.4	16.5	1.1
<b>Intellectual assets</b>	141.0	166.8	25.8
PCT patent applications	67.3	71.8	4.4
Trademark applications	275.6	275.6	0.0
Design applications	157.0	211.3	74.3
<b>Employment impacts</b>	126.1	139.8	13.6
Employment in knowledge-intensive activities	120.5	217.9	-2.6
Employment fast-growing enterprises	57.2	82.7	25.5
<b>Sales impacts</b>	108.0	94.4	-13.7
Medium and high tech product exports	114.3	91.7	-22.5
Knowledge-intensive services exports	145.5	149.0	3.4
Sales of new-to-market/firm innovations	56.6	33.6	-23.0

Dark green: normalised performance above 120% of EU; light green: normalised performance between 90% and 120% of EU; yellow: normalised performance between 50% and 90% of EU; orange: normalised performance below 50% of EU. Normalised performance uses the data after a possible imputation of missing data and transformation of the data.

Change highlighted in green is positive; change highlighted in light red is negative.