

Appendix

This appendix refers to the following journal article

Hoelscher, Michael & Schubert, Jule (2015):

Potential and Problems of Existing Creativity and Innovation Indices.

Creativity Research Journal, 27:1, 1-15.

DOI: 10.1080/10400419.2015.992656

Overview of existing Creativity and Innovation indices

Index	Level / Unit	Indicators	Focus	Available since	Available at
Academic Ranking of World Universities (ARWU) (Shanghai)	Meso: Organizations (Universities)	The index is constructed of the following 6 weighted indicators: <ol style="list-style-type: none"> 1) Alumni of an institution winning Nobel Prizes and Fields Medals (10%) 2) Staff of an institution winning Nobel Prizes and Fields Medals (20%); 3) Highly cited researchers in 21 broad subject categories (20%) 4) Articles published in Nature and Science (not for institution specialized in humanities and social sciences) (20%) 5) Papers indexed in Science Citation Index-expanded, and Social Science Citation Index PUB (20%) 6) Per capita academic performance of an institution (10%) 	Science	2003	http://www.shanghairanking.com/ARWU2012.html
ASAT Global Creativity Index	Macro: Countries Meso: Creative Industries	A total of 138 quantitative and qualitative indicators from publicly available international data sources were categorized into four components. The four components are: <ul style="list-style-type: none"> - Availability of resources - Sustainability of these resources - Adaptability to change - Tenacity for potential growth & development of the creative ecosystem 	Economy	2007	http://www.ipacademy.com.sg/section/thought/project.html
Australia's Innovative Capacity	Macro: Countries	Quantitative data: <ul style="list-style-type: none"> - International Patents Granted by Year of Application - Aggregate Personnel Employed in R&D - Aggregate Expenditure on R&D - Strength of Protection for Intellectual Property - Share of GDP Spent on Secondary and Tertiary Education - GDP Per Capita - GDP - Percentage of R&D Funded by Private Industry - E-G concentration index, excluding the US - Percentage of R&D Performed by Universities 	Economy	1999 (retrospective data collected back to 1973)	http://www.ipria.org/publications/reports/Aus-Innovation-Index-2009-Update.pdf
Businessweek 'World's 50 Most Innovative Companies'	Meso: Companies	Mixture of quantitative and qualitative (experts' ranking) data: <ul style="list-style-type: none"> - Ranking by more than 2,950 executives (weighting: 80%) - three-year revenue (5%) - margin growth (5%) - stock returns (10%) 	Economy	2005	http://www.businessweek.com/intellective_reports/innovative_companies_2010.html
Cultural Initiatives Silicon Valley	Meso: Regions (Communities; Artistic and cultural initiatives and organizations)	Mix of quantitative and qualitative data: <ul style="list-style-type: none"> - Interviews with 361 residents - Organizational survey (125 responses) - Information from a range of secondary data sources 	Arts and Culture	2002	http://www.cpanda.org/stage/studies/a00235

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Cultural Vitality in Communities (Urban Institute)	Meso: Region (Communities)	<p>The following indicators are used to rank US communities</p> <ul style="list-style-type: none"> - Arts Establishments - Employment in Arts Establishments - Arts Nonprofits - Nonprofit Community Celebrations, Festivals, Fairs, Parades - Nonprofit Arts Expenses - Nonprofit Arts Contributions - Artists Jobs <p>Overall, they present a much broader framework for possible quantitative and qualitative data</p>	Arts and Culture	2006	http://www.urban.org/publications/311392.html
Europe Innova	Meso: Companies (in industrial sectors)	<p>A combination of quantitative (for most sectors) and qualitative (for horizontal sectors) methods.</p> <p>Data on 9 sectors: biotechnology, food and drink, electrical and optical equipment, automotive, space and aeronautics, textiles, wholesale and retail trade, knowledge intensive services and construction</p> <p>Five Expert Panels on eco-innovation, gazelles, organisational innovation, lead markets and national specialization.</p> <p>A number of changes applied compared to the first project phase: In addition to the six sectors in the first phase of the Index, three additional sectors have been integrated (wholesale/ retail trade, knowledge intensive services and construction). Furthermore the horizontal focus has been extended and only five Expert Panels have been established for the updated version. (see http://www.europe-innova.eu/web/guest/sectoral-innovation-watch/about).</p>	Economy	2008 (with data available from 2005 – 2008)	http://www.europe-innova.eu/c/document_library/get_file?folderId=812304&name=DLE-13659.pdf
Fast Company 'The World's 50 Most Innovative Companies'	Meso: Companies	Qualitative data (ranking by the editorial staff of the magazine).	Economy	2001	http://www.fastcompany.com/most-innovative-companies/2012/full-list

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Forbes Magazine ‘The World's Most Innovative Companies’	Meso: Companies	<p>The index is based on four indicators, that have undergone some changes between 2011 and 2012:</p> <ol style="list-style-type: none"> 1) Expected future growth of a company (2011: 5 year avg. sales growth (%); 2012: 12 months sales growth (%)) 2) Anticipated growth from existing businesses (2011: 5 year avg. net income growth (%); 2012: 5 year annualized total return (%)) 3) Enterprise value (\$ bil.) (only 2011) 4) Innovation premium (The Innovation Premium is a measure of how much investors have bid up the stock price of a company above the value of its existing business based on expectations of future innovative results (new products, services and markets)) <p>See http://www.forbes.com/sites/innovatorsdna/2012/09/05/how-we-rank-the-worlds-most-innovative-companies/ for a more detailed description on the methodology.</p>	Economy	2011	http://www.forbes.com/innovative-companies/
Innovation Union Scoreboard (IUS)	<p>The IUS is available on different levels:</p> <p>Macro: Countries Meso: Regions</p>	<p>Beginning 2010, the European Innovation Scoreboard (EIS) has been updated as the Innovation Union Scoreboard (IUS). The IUS 2011 largely follows the methodology of previous editions (“European Innovation Scoreboard”) in distinguishing between 3 main types, capturing in total 25 different indicators:</p> <ol style="list-style-type: none"> 1) Enablers: Human resources; open, excellent and attractive research systems, Finance and support 2) Firm activities: Firm investment; Linkages & entrepreneurship; Intellectual assets 3) Outputs: Innovators: Economic effects <p>(See http://www.proinno-europe.eu/inno-metrics/page/1-executive-summary-0)</p>	Economy	<p>2006 (for the EIS)</p> <p>2010 (for the IUS)</p>	http://www.proinno-europe.eu/inno-metrics/page/ius-2011

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Global Creativity Index (GCI) (Richard Florida)	Macro: Countries Meso: Cities	<p>The report covers data of 82 nations for the period 2000 - 2009. The indicators are changing sometimes slightly, but mainly are organised around the “3T”:</p> <ol style="list-style-type: none"> 1) Technology: Global R&D Investment (measured as R&D spending as a share of GDP); Global researchers (measures professional researchers engaged in R&D per million capita); Global innovation (measures patents granted per capita); the technology index (combines all three of these variables in a single measure). 2) Talent: Creative Class (Employed in creative occupations as percentage of total employment); Human Capital (based on the standard measure of educational attainment: rate of enrollment in tertiary or post-high school education from the World Development Indicators.); The talent index (combines these two variables in a single index which is based on a principal component analysis, where the correlations are 0.872 for the Creative Class variable and the Human Capital variable respectively). 3) Tolerance: Tolerance toward ethnic and racial minorities (the survey asks “Is your city or area a good or bad place to be in for ethnic and racial minorities?” The variable scores the share of the respondents who said their place is a good place); Tolerance toward gays and lesbians (same measure as tolerance towards ethnic and racial minorities); The tolerance index (based on the two measures above) 	Looking at lifestyles etc., but interested in their effect on economic growth	2004	<p>http://martinprosperity.org/media/GCI-Report-reduced-Oct%202011.pdf</p> <p>Richard Florida’s homepage with a lot of information: http://creativeclass.com/richard_florida/</p>

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Global Competitiveness Index (GComI)	Macro: Countries	<p>The Index is constructed by the combination of quantitative (statistical data of the UNESCO, WHO and IMF) and qualitative (Executive Opinion Survey) data. The indicators are combined into 12 pillars:</p> <ol style="list-style-type: none"> 1) Basic requirements (key for factor-driven economies): <ul style="list-style-type: none"> - Institutions - Infrastructure - Macroeconomic environment - Health and primary education 2) Efficiency enhancers (key for efficiency-driven economies): <ul style="list-style-type: none"> - Higher education and training - Goods market efficiency - Labor market efficiency - Financial market development - Technological readiness - Marketsize 3) Innovation and sophistication factors (key for innovation-driven economies): <ul style="list-style-type: none"> - Business sophistication - Innovation <p>Depending on a countries' stage of development (identified by the GDP), the GComI weighs those pillars higher that are more relevant for the country, given ist stage of development.</p> <p>Adjustments to the methodology of the index are regularly made and documented detailed (see http://www3.weforum.org/docs/WEF_GCR_Report_2011-12.pdf for more information).</p>	Economy	1979	http://www3.weforum.org/docs/WEF_GCR_Report_2011-12.pdf
Global Innovation Index (GII): The world's top innovators (INSEAD)	Macro: Countries	<p>Combination of quantitative and qualitative data. The 58 quantitative input and 28 output indicators are subsumed under the following topics:</p> <p>Five input pillars capture elements of the national economy that enable innovative activities:</p> <ul style="list-style-type: none"> - Institutions - Human Capital and Research - Infrastructure - Market sophistication - Business sophistication <p>Two (opposed to three in the previous version) output pillars capture actual evidence of innovation outputs:</p> <ul style="list-style-type: none"> - Knowledge and technology outputs - Creative outputs <p>The indicators are slightly changing since the GII model is revised every year. See http://www.globalinnovationindex.org/content.aspx?page=framework for a full description of the GII model.</p>	Economy	2007	http://www.globalinnovationindex.org/userfiles/file/GII-2012-Report.pdf

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Gunn-Report	Meso: Companies Micro: Advertisements	Quantitative: It combines the winners' list from all of the major advertising award contests in the world	Economy; Arts and Culture	1999	http://www.gunnreport.com/
The Cultural and Creative Industries (CCI) in Hong Kong, 2005 to 2010	Meso: Companies (Creative Industries)	Combination of qualitative (policy regulations etc.) and, mainly economy-related, quantitative data. The economic contribution is measured in terms of value added and employment of industries covered in the CCI. It covers 11 component domains. The CCI classification is built on the basic framework developed in the Baseline Study on Hong Kong's Creative Industries undertaken by the Centre for Cultural Policy Research of the University of Hong Kong in 2002-2003 (the 2003 Baseline Study). It was updated subsequent to a comprehensive review conducted in 2010. (See: http://www.statistics.gov.hk/pub/B71204FD2012XXXXB0100.pdf)	Arts and Culture; Economy	2006	http://www.statistics.gov.hk/pub/B71204FD2012XXXXB0100.pdf
IBM-Melbourne Institute	Meso: Economic sectors	Six quantitative indicators are used - R&D intensity - Patent intensity - Trade mark intensity - Design intensity - Organisational/managerial innovation - Productivity	Economy	2007 (with data reaching back to 1990)	http://melbourneinstitute.com/downloads/publications/IBM_Innovation_Index_Report_2010_Final%20Published.pdf
Innovaro: Innovation Leaders	Meso - Companies (different sectors)	Innovation leaders for 25 sectors are identified on the basis of data from the following key areas (the exact measures and the algorithms to put them together are not publicly available and vary by sector): - Organisational culture and supporting structure - Strategic focus on innovation and its role in driving corporate growth - Number of major new product launches and relative success ratios - Growth in revenues, profits and market capitalisation - Average revenue and margin per product or customer - Investment in innovation-related activities such as R&D and marketing - Brand value and human capital growth - Peer review from within the sector - Where applicable: US patents and trademarks	Economy	2000	www.innovationleaders.org
Oregon Innovation Index	Macro/Meso: Region (State)	20 quantitative indicators in five areas: 1) Invention: Invention disclosures; Patents; Patent Citations 2) Translation: R&D Investments; SBIR/STTR Awards; University Licenses/Options; University Licensing Income 3) Commercialization: Venture Capital Investments; Kauffman Index of Entrepreneurship; New Company Creation; University Startups 4) Economic Prosperity: Average Wage; Technology Sector Employment; Foreign Exports 5) Innovative Environment: Educational Attainment; Science & Engineers in Workforce; High Speed Internet Lines; Renewable Energy Usage; Greenhouse Gas Emissions Energy Intensity	Economy	2004	http://www.oregon4biz.com/assets/docs/InnoIndex2009.pdf

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Singapore's Creative Industries	Macro: Countries	<p>The following indicators are used for the benchmarking:</p> <p>Creative Manpower</p> <ul style="list-style-type: none"> - Social Diversity - Size of Creative Workforce - Innovative Capability <p>Markets</p> <ul style="list-style-type: none"> - Copyright Industries Exports - GDP Per Capita at PPP - VA of Knowledge Intensive Industries <p>Infrastructure</p> <ul style="list-style-type: none"> - Institutional Framework - Size of Copyright Industries - Public Expenditure on Media, Arts and Culture 	Economy (creative industries)	2003	http://portal.unesco.org/pv_obj_cache/pv_obj_id_31D85D8BA91100FC3C1AE5DCB267E20D958F0200/filename/MICA++Economic+Contribution+Singapore+2003.pdf
Wired 'The Wired 40'	Meso: Companies	No methodology given, but seems to be qualitative ("The editors name 40 companies...")	Economy	1998	http://www.wired.com/wired/archive/15.04/wired40_list.html
World University Ranking (THES)	Meso: Organizations (Universities)	<p>The ranking uses 13 performance indicators, grouped into five areas:</p> <ol style="list-style-type: none"> 1) Teaching: Academic Reputation Survey; staff-to-student ratio; ratio of PhD to bachelor's degrees awarded by each institution; PhDs awarded by an institution, scaled against its size as measured by the number of academic staff; institutional income scaled against academic staff numbers (30% of overall ranking score) 2) Research: Academic Reputation Survey; university's research income, scaled against staff numbers and normalised for purchasing-power parity; number of papers published in the academic journals indexed by Thomson Reuters per academic staff member, scaled for a university's total size (30%) 3) Citations: number of times all of its published work is cited by scholars around the world (30%) 4) Industry income: amount of research income an institution earns from industry, scaled against the number of its academic staff; (2.5%) 5) International outlook: ratio of international to domestic students; ratio of international to domestic staff; proportion of a university's total research journal publications with at least one international co-author and reward the higher volumes (7.5%). <p>A new methodological approach was developed in this eight year of the Index. For a full account of the changes, see http://www.timeshighereducation.co.uk/world-university-rankings/2011-12/world-ranking/methodology.</p>	Science	2005	http://www.timeshighereducation.co.uk/world-university-rankings/2011-12/world-ranking