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# INTELLIGENCE CAPITAL INDEX

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# ABOUT

In a global knowledge economy, education and creativity are paramount to being competitive. The Intelligence Capital Index (ICI) is a way to gauge the ability of countries to capitalise on the knowledge economy by assessing their environments for education, creativity and talent attraction.

The ICI is a barometer a nation's stock of "smarts". It measures which nations are most likely to expand the frontier of knowledge and/or introduce the technology and innovations of the knowledge economy.

Hitherto, most assessments of a country's knowledge base have been focused on the quantity of education and, when outputs are considered, it is invariably limited to average scholastic performance (in the form of standardised test results). But this view of quantity and of averages is misguided when considering the intelligence capital of a country.

In contrast to alternative measures of human capital and talent, the ICI has several distinguishing features: (i) It adjusts for quality in education outcomes; (ii) It measures the progression of cognitive skills through the human life cycle; (iii) It considers the distribution of cognitive skills with an emphasis on the top performers; and (iv) It includes an external channel (migration) for human capital acquisition.

(1) Quantity of education; (2) Quality of education; (3) Average educational skills; (4) Elite educational skills; (5) Creativity and complexity; and (6) Attractiveness and openness to talent.

Table 1 below lists the 24 variables that comprise the ICI according to six aspects: (1) Quantity of education; (2) Quality of education; (3) Average educational skills; (4) Elite educational skills; (5) Creativity and complexity; and (6) Attractiveness and openness to talent.

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#	QUANTITY (10%)	QUALITY (20%)	AVG SKILLS (10%)	ELITE SKILLS (20%)	CREATIVITY (20%)	ATTRACT (20%)
1	Primary ER*	Top 500 uni	Avg TIMMS (Gr4)*	95 <sup>th</sup> TIMMSS (Gr4)*	Creativity index	Migrant (%)*
2	Secondary ER*	Nobel + Fields	Avg PISA (15yo)*	95 <sup>th</sup> PISA (15yo)*	Complexity index	Skilled labour (%)
3	Tertiary ER	Nobel + Fields/cap*	Avg GMAT (20-34)	700+ GMAT (20-34)	R&D as % GDP	GFCI score
4	Yrs of schooling		Avg PIAAC (18+)	Top PIAAC (18+)		QOL index
5	Expected yrs school					
6	GMAT takers/cap*					

Table 1: Intelligence Capital Index indicators and weights

Weights are inversely proportional to the number of indicators in the aspect. Indicators with an asterisk (\*) have 1/2 weight within aspect.

What determines the knowledge capacity of a nation is not its average capability, but rather the talents of its brightest. The future software engineers, university professors, etc. of a country are not drawn from the pool of students who fall on the average of the spectrum, but rather by those excelling in their domains. That is, it is the Einsteins that expand the frontier of knowledge – although they do so within the framework of society (i.e. averages cannot be ignored, even if they are secondary).

Moreover, quantity measures of education are meaningless without adjusting for quality – a degree from Oxford or Princeton has a lot more gravity than from an unknown university.

Creativity should be part and parcel of any measure of human capital. Rote learning and memorisation are becoming even less valuable in an era when computers and robots are readily available. Indeed, creativity is what separates humans from robots – it is the key that unlocks the power of education.

Finally, little regard has traditionally been bestowed on the ability of nations to attract talent. Cities such as New York, London, Paris, Hong Kong and Singapore are magnets for bright and ambitious people. So even in the absence of a good domestic pipeline for talent, these cities (and thus their respective countries) are able to foster a climate generates knowledge and innovation.

Economies are highly complex and require many different skills. Not everyone will be or should be a STEM graduate or pursue university education. But brains are indeed needed for economies that are growing evermore complex. The ICI is focused on human capital with an emphasis on "smarts". But it is just one dimension of human capital, which should also include emotional intelligence (EQ), cultural intelligence (CQ) and social networks, etc. Notwithstanding that, smarts is what will propel the knowledge economy, so countries that perform well in intelligence capital will be best prepared for the knowledge revolution embodied in the rise of Big Data, cloud computing, artificial intelligence, etc.

The Knowledge Revolution upon us will stress unskilled labour markets as many of these jobs will be lost to automation. At the same time, the rewards to knowledge have and will continue to grow. This will further exacerbate inequality and social divides, and potentially generate even more political division. Policy makers embracing the Knowledge Revolution will need to ensure inclusive growth.

Herein, it is worth noting the gaps between elite and average. For example, India ranks 76<sup>th</sup> on average but 51<sup>st</sup> on elite skills. Given the symmetric/normal nature of distributions in academic performance, this implies a left-tail that is being left far behind. Likewise, although the USA has by far the highest number of elite universities, it ranks just 22<sup>nd</sup> in terms of share of national universities in the global top 500; i.e. most Americans do not have access to globally leading tertiary education.

# **RESULTS (INDEX LIST)**

Table 2 below lists the standing of 128 countries according to the ICI. Columns 1 and 2 in Table 2 are the ICI ranks and scores of the assessed economies. The third column (Grade) is a letter grade designed to be akin to a school grade ranging from A (best) to D (worst) with "+" and "-" notches within each letter grade. Columns 5 through 10 are the ranks for the 6 aspects of the ICI.

RANK	SCORE	GRADE	COUNTRY	QUANTITY	QUALITY	AVG SKILLS	ELITE SKILLS	CREAT- IVITY	ATTRACT
1	74.88	A+	USA	1	1	35	24	3	7
2	64.19	А	UK	22	2	8	3	16	11
3	64.18	А	Germany	19	3	12	10	7	9
4	63.96	А	Australia	2	15	7	1	17	4
5	63.60	Α	Singapore	15	52	2	2	12	2
6	61.58	А	Sweden	21	6	36	14	1	10
7	61.57	Α	Switzerland	27	5	22	20	6	3
8	61.15	А	Canada	12	7	19	5	18	5
9	60.45	А	Finland	14	23	15	9	2	19
10	60.25	А	Denmark	5	9	21	15	9	12
11	58.91	A-	Japan	33	13	3	6	5	28
12	58.74	A-	Netherlands	9	11	14	17	15	8
13	58.73	A-	Belgium	24	18	6	4	20	17
14	58.66	A-	Austria	31	8	9	13	10	13
15	57.33	A-	New Zealand	4	27	11	7	22	14
16	56.69	A-	France	28	4	20	30	14	15
17	56.35	A-	Korea	6	30	5	12	4	38

Table 2: Full results of Intelligence Capital Index

RANK	SCORE	GRADE	COUNTRY	QUANTITY	QUALITY	AVG SKILLS	ELITE SKILLS	CREAT- IVITY	ATTRACT
18	54.98	B+	Norway	10	10	37	26	19	16
19	53.78	B+	Luxembourg	56	12	32	25	30	1
20	53.58	B+	Ireland	11	22	23	28	21	18
21	52.01	B+	Iceland	7	17	38	37	13	23
22	51.79	B+	Czech Republic	26	31	17	16	23	26
23	51.50	B+	Slovenia	16	37	27	35	11	27
24	51.20	B+	Hong Kong	13	34	4	11	34	33
25	50.08	B+	Israel	8	16	67	52	8	20
26	49.95	В	Hungary	36	21	16	19	26	34
27	49.77	В	Spain	18	25	26	31	25	21
28	49.48	В	Estonia	17	69	13	22	28	24
29	47.98	В	Italy	37	19	30	39	27	22
30	47.32	В	China	87	14	1	8	32	61
31	46.56	В	Russia	32	20	18	21	33	47
32	46.34	В	Lithuania	20	24	31	29	39	30
33	45.83	В	Latvia	34	38	29	23	40	29
34	45.73	В	Taiwan	23	44	10	33	24	54
35	45.61	В	Poland	30	26	28	32	35	32
36	44.80	B-	Portugal	35	32	33	42	29	25
37	43.61	B-	Slovakia	38	69	24	34	36	40
38	43.33	B-	Bulgaria	40	56	25	18	49	52
39	40.81	B-	Malta	54	69	40	41	43	35
40	40.50	B-	Argentina	25	42	57	36	37	53
41	40.11	B-	Greece	3	45	43	55	51	39
42	39.40	C+	Romania	51	43	34	27	54	64
43	38.54	C+	Cyprus	44	29	41	56	52	36
44	38.45	C+	Croatia	43	50	42	60	45	37
45	38.33	C+	Ukraine	29	39	39	45	41	68
46	37.94	C+	Uruguay	48	69	56	38	44	56
47	37.79	C+	Chile	42	46	52	44	50	46
48	36.22	C+	Brazil	82	41	60	54	31	55
49	35.88	C+	UAE	85	69	53	77	79	6
50	35.50	C+	Malaysia	72	62	70	58	38	41
51	35.17	C+	Serbia	45	54	48	48	46	72
52	35.05	C+	Kazakhstan	49	69	45	46	72	59
53	34.56	С	Montenegro	41	69	50	74	53	44
54	33.35	С	Turkey	55	57	64	50	55	62
55	32.98	С	South Africa	70	28	102	64	42	43
56	32.39	С	Costa Rica	62	53	65	72	47	58
57	31.70	С	Mauritius	52	69	89	53	73	50
58	31.50	С	Georgia	50	69	46	43	66	97
59	31.48	С	Moldova	63	69	44	40	92	86
60	31.32	С	Qatar	79	69	63	80	78	31
61	30.69	С	Mexico	83	51	68	78	48	60
62	30.23	С	Saudi Arabia	39	47	84	93	57	57
63	29.79	C-	Kuwait	65	69	79	104	65	42
64	29.64	C-	Armenia	60	69	51	57	86	71
65	29.62	C-	Bahrain	59	69	61	87	84	45
66	29.36	C-	India	98	36	76	51	59	70
67	29.16	C-	Thailand	69	69	73	75	56	65
68	28.92	C-	Trinidad & Tobago	81	33	88	62	74	63
69	28.80	C-	Panama	71	69	85	100	64	48
70	28.57	C-	Azerbaijan	74	58	47	47	109	91

RANK	SCORE	GRADE	COUNTRY	QUANTITY	QUALITY	AVG SKILLS	ELITE SKILLS	CREAT- IVITY	ATTRACT
71	28.33	C-	Macedonia	76	40	55	66	71	81
72	27.95	C-	Peru	68	65	66	63	83	74
73	27.85	C-	Colombia	75	67	69	70	61	77
74	27.37	C-	Mongolia	47	69	54	59	96	93
75	27.24	C-	Kyrgyzstan	61	69	49	49	107	101
76	27.05	C-	Oman	84	69	72	101	94	51
77	26.81	C-	Venezuela	46	64	71	79	70	89
78	26.66	C-	Jamaica	78	69	93	65	68	79
79	26.56	C-	Philippines	92	69	75	69	60	88
80	25.99	C-	Jordan	57	69	104	116	67	49
81	25.77	C-	Bosnia	73	35	59	73	77	98
82	25.53	C-	Iran	58	48	81	67	58	108
83	25.28	C-	Ecuador	66	69	87	103	69	84
84	25.13	C-	Vietnam	94	59	74	68	88	85
85	24.81	D+	Tunisia	80	69	91	92	81	76
86	24.45	D+	Paraguay	95	69	80	84	101	66
87	23.94	D+	Dominican Republic	88	69	92	107	87	73
88	23.90	D+	Botswana	93	69	107	85	62	78
89	23.70	D+	Indonesia	90	69	83	76	105	82
90	23.38	D+	Albania	64	69	58	71	115	102
91	23.22	D+	Sri Lanka	67	69	96	110	110	67
92	23.08	D+	Tajikistan	86	69	62	61	118	105
93	22.81	D+	Guatemala	105	55	78	83	80	90
94	22.57	D+	Morocco	102	69	95	90	100	69
95	22.54	D+	Nicaragua	100	69	86	102	75	92
96	22.31	D+	Bolivia	89	69	82	94	112	87
97	21.67	D+	El Salvador	97	69	77	81	102	96
98	21.55	D+	Egypt	91	49	103	115	89	75
99	20.23	D+	Honduras	101	69	90	105	99	100
100	19.75	D	Lebanon	53	69	100	114	82	114
101	19.63	D	Pakistan	121	61	94	106	106	80
102	19.31	D	Kenya	109	66	110	89	63	110
103	19.06	D	Algeria	77	69	101	112	104	103
104	18.93	D	Zambia	96	69	111	91	111	95
105	18.89	D	Namibia	104	69	114	97	113	83
106	18.83	D	Laos	108	69	105	109	95	94
107	18.29	D	Nepal	106	69	98	113	90	107
108	17.75	D	Cameroon	107	69	108	86	91	112
109	17.40	D	Ghana	99	63	109	88	122	99
110	16.90	D	Bangladesh	112	60	97	111	121	106
111	16.07	D	Cambodia	110	69	99	108	123	104
112	16.07	D	Lesotho	111	69	112	95	108	113
113	14.37	D-	Tanzania	119	69	113	96	119	115
114	13.88	D-	Nigeria	118	68	106	82	124	116
115	13.16	D-	Senegal	126	69	119	120	76	111
116	12.83	D-	Benin	113	69	118	119	93	120
117	12.41	D-	Uganda	116	69	124	124	98	109
118	11.69	D-	Zimbabwe	103	69	115	117	120	124
119	11.55	D-	Mauritania	123	69	120	99	125	121
120	10.93	D-	Mozambique	122	69	126	126	97	118
121	10.74	D-	Malawi	115	69	122	122	116	117
122	10.32	D-	Chad	128	69	117	98	128	122
123	10.30	D-	Ethiopia	125	69	121	121	103	123

DANK	SCORE	CRADE	COUNTRY	OLIANITITY			ELITE	CREAT-	ATTRACT
NAINK	SCORE	GRADE	COUNTRY	QUANTIT	QUALITY	AVG SKILLS	SKILLS	ΙVITY	ATTRACT
124	9.91	D-	Mali	127	69	125	125	85	126
125	9.89	D-	Rwanda	117	69	128	128	117	119
126	8.99	D-	Madagascar	114	69	116	118	127	125
127	8.79	D-	Burundi	120	69	123	123	114	128
128	6.76	D-	Guinea	124	69	127	127	126	127

\* Only economies with at least 15 valid indicators (of the 24 in total) are included.

#### METHODOLOGY

#### GROUPING

The ICI is comprised of 24 indicators aggregated into 6 groups ("aspects").

# Aspect 1: Quantity of education ("Quantity")

Quantity of education is a measure of total schooling in a country. This is measured by enrolment rates (primary, secondary and tertiary), years of schooling (average and expected) and the volume of graduate school entry testing.

# Aspect 2: Quality of education ("Quality")

Quality of education is measured by assessing university quality (number of top-500 universities in a country) as well as by the number of Nobel Prizes and Fields Medals associated with a country. Prizes are mapped to a country by multiple channels: (i) Country of citizenship of winner; (ii) Domicile of higher education (typically at graduate/PhD level) of winner; (iii) Domicile of research institute associated with winner (where prize-winning work was done and/or at institute most associated with the recipient).

# Aspect 3: Average cognitive skills ("Avg skills")

Average skills is a measure of average cognitive skills assessed over the human life cycle: (i) At primary level (grade 4); (ii) At secondary level (15-year-olds); (iii) At tertiary level (age 20-34); and (iv) As adults (18+).

# Aspect 4: Elite cognitive skills ("Elite skills")

Elite skills is a measure of top-performing cognitive skill assessed over the human life cycle: (i) At primary level (grade 4); (ii) At secondary level (15-year-olds); (iii) At tertiary level (age 20-34); and (iv) As adults (18+). Top performance is taken as the 95<sup>th</sup> percentile in the primary and secondary levels. For the 20-34 age group, it is the proportion of examinees scoring 700 points or higher on the GMAT. For adults it is the top bucket of performance on the PIAAC test administered by the OECD.

# Aspect 5: Creativity and complexity ("Creativity")

Creativity and complexity are assessed through index measures of the two (creativity index and economic complexity index), as well as R&D as share of GDP (GERD), which is a proxy measure of both.

# Aspect 6: Attractiveness and openness to talent ("Attract")

Attractiveness and openness to talent is a measure of how desirable a country is to talent. Additionally, it is a gauge on the ease with which talent can enter a country. Indicators in this aspect include the migrant share of a country's population as well as the skilled labour share of the workforce. The Global

Financial Centres Index (top city score of a country) is used to proxy the attract and openness qualities (as finance is a global industry associated with high talent).

# WEIGHTS

The index is (linearly) additive and the contribution of each aspect to the final index score is 20 percent, with the exception of Quantity and Average Skills, which each account for 10 percent of the final weight. This is to reflect the fact that for expanding the frontier of knowledge, quality and elite skills matter more than quantity and average skills, respectively.

Weights of individual indicators within each aspect are inversely proportional to the number of indicators in the group. However, some indicators are assigned a half weight within an aspect. These are typically for indicators that are judged to be less relevant than the others within the group. For example, cognitive skills performance in grade 4 (TIMMS) and as a teenager (PISA) is less important than skills as a tertiary student or adult. (Of course performance at a young age is a lead indicator of smarts in later years.)



Indicators marked with an asterisk (\*) are assigned a half weight within the aspect.

# NORMALISATION

Before indicators can be aggregated to form an index score they must be converted into unit-free measures. Normalisation is done by mapping indicator values into a score. The function used to normalise is of the form

$$s(x) = 100 \left[ \frac{x - min}{max - min} \right]$$

where x is the raw value of the indicator. In some cases where the data are not normal, or have extreme outliers, it may require to apply the transformation  $s(\bullet)$  on the logged values of the variable.<sup>1</sup>

# **MISSING VALUES**

The Index takes a multiple-step process in dealing with missing indicator values. Firstly, it should be noted that indicators always take on a value in an index – either explicitly or implicitly. For example,

<sup>&</sup>lt;sup>1</sup> This was not applied to any of the variables, although it was tested for the top-500 universities indicator.

when an indicator is "not considered" most indices redistribute the weight of the missing indicator to the remaining indicators (usually within its most local grouping). But this is mathematically equivalent to the missing variable taking an "implicit" value equal to the inverse function of the (weighted) average of the scores of the remaining indicators in the grouping. Thus when an index takes this approach the missing value has, *a priori*, no impact on the index score, but *ex post* can have a big impact depending on how the implicit value of the indicator compares with the real value (if it were known).

In the ICI, when indicators are missing, the principle of conservatism (in two stages) is applied. First, for the purpose of dealing with missing values countries are grouped into like categories based on geography, culture and development. Then the minimum principle is applied in 2 stages: (1) Use the minimum value for that indicator within the group for the country with the missing value. (2) If the no values exist for the entire group then take the global minimum value.

This technique avoids rewarding countries with missing values by simply "not considering" the indicator as when countries do not report data it is often a sign of low progress in development or human capital acquisition. The majority of the indicator gaps are for TIMMS, PISA and PIAAC scores as they are assessed only for OECD countries and some special cases. But as the OECD countries are essentially a "rich countries group" (high income democracies), the countries not included in the TIMMS and OECD samples are likely to be at the lower spectrum of the distribution anyhow. Moreover, the special cases are typically leading non-OECD countries.

# AGGREGATION

The index is a weighted average of the 24 indicators

$$I(x) = \sum\nolimits_{i=1}^{24} \omega_i \cdot s(x_i)$$

where the  $s(x_i)$  are as defined in (1). The Index value is an ordinal measure.

# **COVERAGE & INCLUSION**

197 economies are assessed by the Index; however, only 128 are reported in the final index. For inclusion a country must have at least 15 valid indicators out of a total of 24 used in the index.

The excluded countries are, for the most part, either small countries/economies/dependencies or least developed nations that typically have porous (and weak) data on human capital indicators. The average score of the excluded group is 17 (D) and none have a score higher than 40 (B-).

#### INDICATORS

# 1. QUANTITY OF EDUCATION (10%)

# Primary enrolment ratio (net) – PER

The net primary enrolment ratio is the value of the total number of students enrolled in primary education (ISCED 1) of primary school age divided by the population of primary school age persons. This typically corresponds to the first six years of formal education (age group: 6-12).

Source: Unesco Institute for Statistics – UIS (2015)

# Secondary enrolment ratio (gross) – SER

The gross secondary enrolment ratio is the value of the total number of students enrolled in secondary education (ISECD 3) regardless of age divided by the theoretical secondary school age group. This typically corresponds to the grades 7 through 12 (age group: 13-17).

Source: Unesco Institute for Statistics – UIS (2015)

# Tertiary enrolment ratio (gross) – TER

The value of the total number of students enrolled in full-time tertiary education (ISCED 6, 7, 8) regardless of age divided by the 5-year age group that follows after secondary education (usu. the 18-22 age group). This ratio excludes those registered in post-secondary non-tertiary education (ISCED 4).

Source: Unesco Institute for Statistics – UIS (2015)

# Mean years of schooling – MYS

The average number of ISCED completed years of schooling of the 25+ age group in a country.

Source: Unesco Institute for Statistics – UIS (2015)

#### Expected years of schooling – EYS

The years of schooling people under age 25 could expect to receive by the time they are reach age 25 based on current patterns of enrolment and graduation.

Source: Unesco Institute for Statistics – UIS (2015)

#### GMAT test takers per capita

The number of *citizens* of a country who have taken the Graduate Management Admission Test (GMAT) in a given year regardless of exam loication. The value is divided by the age 20-34 age group.

Source: Graduate Management Admission Council – GMAC (2015)

#### 2. QUALITY OF EDUCATION (20%)

#### **Top-500 universities**

The quality-adjusted count of the number of top-500 universities in a country. The adjustment assigns a value according to a university's ranking in the ARWU according to the following schedule:

ARWU RANK	SCORE
1-10	10
11-25	9
26-50	8
51-75	7
76-100	6
101-150	5
151-200	4
201-300	3
301-400	2
401-500	1

Source: Academic Ranking of World Universities (ARWU) – Shanghai Jiao Tong University (2015)

# Nobel & Fields medallists

The number of Nobel Prize winners plus the number of Fields Medallist recipients. The awards are mapped (not unique) to countries by: (1) Country of birth/primary residence or citizenship; (2) Domicile of institute where winner undertook higher education (usually at the PhD or equivalent level); (3) The domicile of institute for which research associated with the prize was primarily conducted.

Source: Nobel Foundation, Fields Institute

# Nobel & Fields medallists per capita

The total number of prizes awarded through 2016 divided by the 2016 (mid-year) national population.<sup>2</sup>

Source: Nobel Foundation, Fields Institute, national censuses

#### 3. AVERAGE COGNATIVE SKILLS (10%)

#### Mean TIMMS score (grade 4)

The average score in the TIMMS (Trends in International Mathematics and Science Study) grade 4 assessment on math, reading and science.

Source: TIMMS, Boston College (2015)

#### Mean PISA score (age 15)

The average score on the math, reading and science assessments in the PISA (programme for international student assessment) test administered by the OECD.

Source: Organisation for Economic Cooperation and Development – OECD (2015)

#### Mean GMAT score

The average GMAT score based on citizenship status (regardless of where test was taken) of persons age 20-34.

Source: Graduate Management Admission Council – GMAC (2015)

# Mean PIAAC performance (adult)

The average proficiency score in literacy, numeracy and problem solving (in a technology-rich environment).

Source: Organisation for Economic Cooperation and Development – OECD (2015)

# 4. ELITE COGNITIVE SKILLS (20%)

# +Elite (95<sup>th</sup> percentile) TIMMS score (grade 4)

The average of the 95<sup>th</sup> percentile scores on the TIMMS reading, math and science assessments.

Source: TIMMS, Boston College (2015)

<sup>&</sup>lt;sup>2</sup> Mathematically it would be more precise to calculate year-by-year ratio and take the average of that but a readily accessible dataset based on those parameters currently does not exist.

# Elite (95<sup>th</sup> percentile) PISA score (age 15)

The average of the 95<sup>th</sup> percentile scores on the math, science and reading components of PISA.

Source: Organisation for Economic Cooperation and Development – OECD (2015)

#### Elite (700+ score) GMAT score

The share of the test takers, by citizenship (regardless of where test was taken), who score 700 or more on the GMAT.

Source: Graduate Management Admission Council – GMAC (2015)

#### Elite (top proficiency) PIAA performance

The share of test takers scoring in the highest proficiency group in the PIAA test covering literacy, numeracy and problem solving (in a technology-rich environment).

Source: Organisation for Economic Cooperation and Development – OECD (2015)

# 5. CREATIVITY & COMPLEXITY (20%)

#### **Global Creativity Index score**

Creativity is assessed through an index that measures creativity. The most notable one is the Global Creativity Index from the Martin Prosperity Institute (University of Toronto). The index is comprised of three components: (1) technology; (2) talent; and (3) tolerance.

Source: Martin Prosperity Institute (2015)

#### Index of Economic Complexity score

Economic complexity and creativity are intertwined concepts as a complex economy (which produces high-value-added goods and services) requires smart, creative people. Complexity here is measured by the Index of Economic Complexity as developed by Hidalgo and Hausmann (2009). However, the index only captures data related to the tradeable sector.

#### Source: Observatory of Economic Complexity; MIT (2015)

#### R&D as a share of GDP

Gross expenditures on research and experimental development (GERD) as a share of GDP is the one of the most widely quoted measures of innovation. Nevertheless, as an input (rather than an output) indicator, its merit can be ambiguous as it does not quantify the effectiveness of expenditures.

Source: Unesco Institute for Statistics – UIS (2015)

# 6. ATTRACTIVENESS & OPENNESS TO TALENT (20%)

#### Migrant share of population (%)

The share of the population born outside the country.

Source: World Bank Development Indicators Database (2015)

#### Skilled labour as share of employment (%)

The share of high-skilled workers relative to total employment. Defined as persons employed in occupations that require tertiary education (ISECD 5-6).

Source: WEF Human Capital Report; ILO (2015)

# **Global Financial Centres Index (GFCI) score**

Finance is perhaps the most global industry and where there is a premium for (mobile) talent. The GFCI ranks financial centres around the world. High placement in the GFCI is thus an indicator of a high share of the labour force with finance and related skills. As the GFCI ranks cities, the top city for a country is used for the national value.

Source: Z/Yen GFCI19 (2016)

# Quality of Life Index

Mercer compiles an annual Quality of Living Survey that assesses the quality of life in cities around the world. The intent of the survey is to help employers assess the optimality/feasibility of international placements for their staff. The survey is thus a quality-of-life index for expatriates, so not necessarily reflecting the overall quality of life for a country. That is, it is a ranking that assesses the attractiveness of a country to mobile talent.

As the survey assesses cities, the top city ranking is used for the national value.

Source: Mercer (2016)

# **INTELLIGENCE CAPITAL INDEX vs GDP**



Error! Reference source not found. (left) compares average income (PPP) against the ICI score. The correlation is very strong with an rsquare of close to 0.7. However, some rich countries are considerably below the trend line and will need to enhance their human capital for retained prosperity. Note, however, that for sustained growth, countries should promote inclusive knowledge-driven. growth

Source: Author's calculations, World Bank, WEF

#### **RESULTS (SELECT)**

Which countries have the best (elite) intellectual ecosystems?

The top-15 ICI countries include 10 from Europe, 2 from (East) Asia and 6 from the English-speaking world. The prevalence of English amongst the top ICI countries should come as no surprise as the English language, *per se*, is a competitive advantage for nations. English is the global *lingua franca* and the international language of business and knowledge. (See the Power Language Index <u>here</u>.)

The United States comes out on top with a clear lead over the rest of the field. Its dominant position is a result of its exceptional performance on the quality (of education) aspect. It is home to a majority of the world's leading institutions of higher learning and has earned an outsized number of Nobel Prizes and Fields Medals. Its status as a magnet for talent is also reflected in its high creativity (3) and attract (7) aspect rankings – indeed, Silicon Valley, Wall Street and Boston/Cambridge are the world's leading centres for IT/entrepreneurship, finance and research/higher education, respectively. However, the country lags in its average skills (35) and elite skills (23) aspects, and recent political developments may tarnish its international appeal and attraction power.

Number 2 on the list is the UK, powered by its strong performance in its quality (2) and elite skills (3) aspects. Germany (3) is the leading non-English-speaking nation. It is also a powerhouse in (educational) quality (3), trailing just the USA and UK as a centre for academic excellence. Australia places 4<sup>th</sup> and is the global leader in the elite skills aspect. Singapore finishes an impressive 5<sup>th</sup> in the ICI in spite of its small size – size is an advantage in the quality aspect as it counts the number of top-ranked universities (quality adjusted) domiciled there. Here Singapore boasts two global universities (NUS and NTU).

Rounding out the top 10 are Sweden, Switzerland, Canada, Finland and Denmark. Japan (11) just misses inclusion in the top-10 due to its weak standing in attracting talent (28). If not for the attract aspect, it would place 5<sup>th</sup> in the ICI. Sweden is notable for having a big gap between average and elite performance (23 positions), driven most likely by the demographics of recent immigration.

These results are a snapshot in time. Countries such as Korea (17) and Israel (25) are aggressively targeting their knowledge sectors, while other nations seem to be regressing to a state of scientific ignorance.

The results herein also show that the quantity of education is not a primary factor in intelligence capital – although the top country has a high quantity aspect rank, it is not true for most other top performers. (Indeed, it is likely the case that the USA produces too many tertiary graduates with questionable skills.)

The BRICK (BRIC + Kazakhstan) nations are also worth noting. China and Russia lead this group, placing 30<sup>th</sup> and 31<sup>st</sup>, respectively. Brazil comes in at 48<sup>th</sup> and Kazakhstan at 52<sup>nd</sup>. India is the laggard in this group at 66<sup>th</sup>. Where India falls short in the ICI is the near absence of

China is noted for being a global leader in cognitive skills, placing in the top-10 for both average (1) and elite (8) skills. Yet its standing reinforces the point that knowledge and human capital is more than just about education, but rather the sum of holistic factors that include EQ, CQ (and especially cross-cultural assertiveness), creativity, etc.

Russia's strong performance on average (18) and elite (21) skills are weighed down by its lacklustre ability to attract talent (47). Kazakhstan, on the other hand, is one of many nations without a globally recognised university. Neither does it count a connection to the elite and prestigious Nobel Prize or Fields Medal.

# **COUNTRY PROFILES (TOP 15)**

USA

ICI rank: 1

ICI score: 74.88

Skills inequality:\*\* +11

Geography: Anglo

Missing values: 0



IND #	INDICATOR	VALUE	RANK	IND #	INDICATOR	VALUE	RANK
1	Quan	tity		4	Elite skill	VALUE  RA    680  1    652  1    4.6%  4    2.1  1	
1.1	Primary ER (net)*	91.4	91	4.1	95 <sup>th</sup> TIMMS (Gr4)*	680	10
1.2	Secondary ER (gross)*	93.7	61	4.2	95 <sup>th</sup> PISA (15yo)*	652	16
1.3	Tertiary ER (gross)	94.3	3	4.3	700+ GMAT (age 20-34)	4.6%	48
1.4	Mean yrs schooling	12.9	5	4.4	Top PIAAC (18+)	2.1	13
1.5	Expected yrs schooling	16.5	15				
1.6	GMAT takers/cap*	1,376.3	1				
2	Qual	ity		5	Creativit	У	
2.1	Top 500 universities	681	1	5.1	Global Creativity Index	0.95	2
2.2	Nobel+Fields prizes	384	1	5.2	Economic Complexity	1.80	5
2.3	Noble+Fields/cap*	1.2	17	5.3	R&D as % of GDP	2.74%	11
3	Avg si	kills		6	Attract		
3.1	Avg TIMMS (Gr4)*	547	8	6.1	Migrant (%)*	14.5	54
3.2	Avg PISA (15yo)*	492	27	6.2	Skilled labour (%)*	42.2	21
3.3	Avg GMAT (age 20-34)	532	48	6.3	GFCI score	792	2
3.4	Avg PIAAC (18+)	249	16	6.4	Mercer QOL avg rank	27	27

\* Half weight within group. \*\* Rank difference between elite skills and average skills (positive value 🗲 elite outperformance)



UK

ICI rank: 2

ICI score: 64.19

Skills inequality:\*\* +5

Geography: Anglo

Missing values: 0



IND #	INDICATOR	VALUE	RANK	IND #	INDICATOR	VALUE	RANK
1	Quan	tity		4	Elite skil	ls	
1.1	Primary ER (net)*	99.9	3	4.1	95 <sup>th</sup> TIMMS (Gr4)*	682	8
1.2	Secondary ER (gross)*	95.4	54	4.2	95 <sup>th</sup> PISA (15yo)*	651	17
1.3	Tertiary ER (gross)	61.9	37	4.3	700+ GMAT (age 20-34)	12.7%	7
1.4	Mean yrs schooling	13.1	2	4.4	Top PIAAC (18+)	2.4	12
1.5	Expected yrs schooling	16.2	22				
1.6	GMAT takers/cap*	124.5	42				
2	Qual	lity		5	Creativit	ty	
2.1	Top 500 universities	158	2	5.1	Global Creativity Index	0.881	12
2.2	Nobel+Fields prizes	127	2	5.2	Economic Complexity	1.60	11
2.3	Noble+Fields/cap*	2.0	9	5.3	R&D as % of GDP	1.70%	23
3	Avg s	kills		6	Attract		
3.1	Avg TIMMS (Gr4)*	546	9	6.1	Migrant (%)*	13.2	61
3.2	Avg PISA (15yo)*	502	19	6.2	Skilled labour (%)*	48	8
3.3	Avg GMAT (age 20-34)	586	7	6.3	GFCI score	800	1
3.4	Avg PIAAC (18+)	252	14	6.4	Mercer OOL index	55	55

\* Half weight within group. \*\* Rank difference between elite skills and average skills (positive value 🗲 elite outperformance)



#### GERMANY

ICI rank: 3

ICI score: 64.18

Skills inequality:\*\* +2

Geography: West Europe

Missing values: 0

IND #	INDICATOR	VALUE	RANK	IND #	INDICATOR	VALUE	RANK
1	Quan	tity		4	Elite skil	ls	
1.1	Primary ER (net)*	97.7	30	4.1	95 <sup>th</sup> TIMMS (Gr4)*	650	24
1.2	Secondary ER (gross)*	101.3	27	4.2	95 <sup>th</sup> PISA (15yo)*	660	14
1.3	Tertiary ER (gross)	61.7	38	4.3	700+ GMAT (age 20-34)	9.1%	16
1.4	Mean yrs schooling	13.1	1	4.4	Top PIAAC (18+)	2.8	7
1.5	Expected yrs schooling	16.5	16				
1.6	GMAT takers/cap*	270.0	21				
2	Qual	lity		5	Creativit	ty	
2.1	Top 500 universities	128	3	5.1	Global Creativity Index	0.837	14
2.2	Nobel+Fields prizes	106	3	5.2	Economic Complexity	2.05	3
2.3	Noble+Fields/cap*	1.3	15	5.3	R&D as % of GDP	2.87%	10
3	Avg s	kills		6	Attract		
3.1	Avg TIMMS (Gr4)*	532	13	6.1	Migrant (%)*	14.9	51
3.2	Avg PISA (15yo)*	515	14	6.2	Skilled labour (%)*	43.1	19
3.3	Avg GMAT (age 20-34)	567	16	6.3	GFCI score	689	19
3.4	Avg PIAAC (18+)	254	13	6.4	Mercer QOL index	4	4

\* Half weight within group. \*\* Rank difference between elite skills and average skills (positive value 🗲 elite outperformance)



#### AUSTRALIA

ICI rank: 4

ICI score: 63.96

Skills inequality:\*\* +6

Geography: Anglo

Missing values: 0



IND #	INDICATOR	VALUE	RANK		IND #	INDICATOR	VALUE	RANK
1	Quan	tity			4	Elite skil	ls	
1.1	Primary ER (net)*	97.4	34		4.1	95 <sup>th</sup> TIMMS (Gr4)*	663	18
1.2	Secondary ER (gross)*	135.5	1		4.2	95 <sup>th</sup> PISA (15yo)*	674	7
1.3	Tertiary ER (gross)	86.3	5		4.3	700+ GMAT (age 20-34)	14.2%	3
1.4	Mean yrs schooling	13.0	4		4.4	Top PIAAC (18+)	3.0	6
1.5	Expected yrs schooling	20.2	1					
1.6	GMAT takers/cap*	159.6	31					
2	Qual	lity			5	Creativit	y	
2.1	Top 500 universities	63	7		5.1	Global Creativity Index	0.97	1
2.2	Nobel+Fields prizes	14	14		5.2	Economic Complexity	0.30	56
2.3	Noble+Fields/cap*	0.6	25		5.3	R&D as % of GDP	2.12%	16
3	Avg s	kills			6	Attract		
3.1	Avg TIMMS (Gr4)*	520	27		6.1	Migrant (%)*	28.2	32
3.2	Avg PISA (15yo)*	515	14		6.2	Skilled labour (%)*	45	12
3.3	Avg GMAT (age 20-34)	593	3		6.3	GFCI score	692	18
3.4	Avg PIAAC (18+)	206	19	]	6.4	Mercer QOL index	10	10

\* Half weight within group. \*\* Rank difference between elite skills and average skills (positive value 🗲 elite outperformance)



#### SINGAPORE

ICI rank: 5

ICI score: 63.60

Skills inequality:\*\* 0

Geography: East Asia

Missing values: 2

IND #	INDICATOR	VALUE	RANK	IND #	INDICATOR	VALUE	RANK
1	Quan	tity		4	Elite skil	ls	
1.1	Primary ER (net)*	100.0	1	4.1	95 <sup>th</sup> TIMMS (Gr4)*	724	1
1.2	Secondary ER (gross)*	107.6	17	4.2	95 <sup>th</sup> PISA (15yo)*	702	2
1.3	Tertiary ER (gross)	82.7	9	4.3	700+ GMAT (age 20-34)	14.7%	2
1.4	Mean yrs schooling	10.6	49	4.4	Top PIAAC (18+)	n/a	n/a
1.5	Expected yrs schooling	15.4	38				
1.6	GMAT takers/cap*	783.1	6				
2	Qual	lity		5	Creativit	ty	
2.1	Top 500 universities	9	25	5.1	Global Creativity Index	0.896	9
2.2	Nobel+Fields prizes	0	72	5.2	Economic Complexity	1.73	8
2.3	Noble+Fields/cap*	0.0	72	5.3	R&D as % of GDP	2.19%	15
3	Avg s	kills		6	Attract		
3.1	Avg TIMMS (Gr4)*	585	2	6.1	Migrant (%)*	45.4	14
3.2	Avg PISA (15yo)*	555	2	6.2	Skilled labour (%)*	54.7	2
3.3	Avg GMAT (age 20-34)	595	2	6.3	GFCI score	755	3
3.4	Avg PIAAC (18+)	n/a	n/a	6.4	Mercer QOL index	26	26

\* Half weight within group. \*\* Rank difference between elite skills and average skills (positive value 🗲 elite outperformance)





#### **SWEDEN**

ICI rank: 6

ICI score: 61.58

Skills inequality:\*\* +22

Geography: North Europe

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Aissing	values: 0						
IND #	INDICATOR	VALUE	RANK	IND #	INDICATOR	VALUE	RANK
1	Quan	tity		4	Elite ski	lls	
1.1	Primary ER (net)*	99.3	7	4.1	95 <sup>th</sup> TIMMS (Gr4)*	647	28
1.2	Secondary ER (gross)*	98.4	41	4.2	95 <sup>th</sup> PISA (15yo)*	649	19
1.3	Tertiary ER (gross)	70.0	26	4.3	700+ GMAT (age 20-34)	3.3%	61
1.4	Mean yrs schooling	12.1	18	4.4	Top PIAAC (18+)	3.8	2
1.5	Expected yrs schooling	15.8	27				
1.6	GMAT takers/cap*	346.7	12				
2	Qual	ity		5	Creativi	ty	
2.1	Top 500 universities	34	13	5.1	Global Creativity Index	0.915	7
2.2	Nobel+Fields prizes	32	6	5.2	Economic Complexity	1.89	4
2.3	Noble+Fields/cap*	3.3	4	5.3	R&D as % of GDP	3.16%	5
3	Avg si	kills		6	Attrac	t	
3.1	Avg TIMMS (Gr4)*	526	20	6.1	Migrant (%)*	16.8	44
3.2	Avg PISA (15yo)*	482	37	6.2	Skilled labour (%)*	49.1	6
3.3	Avg GMAT (age 20-34)	516	61	6.3	GFCI score	648	40
3.4	Avg PIAAC (18+)	262	6	6.4	Mercer QOL index	19	19

\* Half weight within group. \*\* Rank difference between elite skills and average skills (positive value 🗲 elite outperformance)



#### SWITZERLAND

ICI rank: 7

ICI score: 61.57

Skills inequality:\*\* -2

Geography: West Europe

Missing values: 4

IND #	INDICATOR	VALUE	RANK	IND #	INDICATOR	VALUE	RANK
1	Quan	tity		4	Elite skil	ls	
1.1	Primary ER (net)*	93.4	76	4.1	95 <sup>th</sup> TIMMS (Gr4)*	n/a	n/a
1.2	Secondary ER (gross)*	96.3	51	4.2	95 <sup>th</sup> PISA (15yo)*	667	9
1.3	Tertiary ER (gross)	55.6	46	4.3	700+ GMAT (age 20-34)	8.7%	19
1.4	Mean yrs schooling	12.8	6	4.4	Top PIAAC (18+)	n/a	n/a
1.5	Expected yrs schooling	15.8	29				
1.6	GMAT takers/cap*	312.7	16				
2	Qual	lity		5	Creativit	ty	
2.1	Top 500 universities	41	11	5.1	Global Creativity Index	0.822	15
2.2	Nobel+Fields prizes	28	7	5.2	Economic Complexity	2.10	2
2.3	Noble+Fields/cap*	3.4	3	5.3	R&D as % of GDP	2.97%	9
3	Avg s	kills		6	Attract		
3.1	Avg TIMMS (Gr4)*	n/a	n/a	6.1	Migrant (%)*	29.4	31
3.2	Avg PISA (15yo)*	518	13	6.2	Skilled labour (%)*	51.3	3
3.3	Avg GMAT (age 20-34)	564	19	6.3	GFCI score	714	6
3.4	Avg PIAAC (18+)	n/a	n/a	6.4	Mercer QOL index	2	2



\* Half weight within group. \*\* Rank difference between elite skills and average skills (positive value 🗲 elite outperformance)



# CANADA

ICI rank: 8

ICI score: 61.15

Skills inequality:\*\* +14

Geography: Anglo

Missing values: 1



IND #	INDICATOR	VALUE	RANK	IND #	INDICATOR	VALUE	RANK
1	Quan	tity		4	Elite skil	ls	
1.1	Primary ER (net)*	99.1	8	4.1	95 <sup>th</sup> TIMMS (Gr4)*	702.0	3
1.2	Secondary ER (gross)*	103.4	22	4.2	95 <sup>th</sup> PISA (15yo)*	666.0	10
1.3	Tertiary ER (gross)	58.9	42	4.3	700+ GMAT (age 20-34)	8.9	5
1.4	Mean yrs schooling	13.0	3	4.4	Top PIAAC (18+)	3.1	18
1.5	Expected yrs schooling	15.9	26				
1.6	GMAT takers/cap*	37.21	4				
2	Qual	lity		5	Creativity		
2.1	Top 500 universities	76	6	5.1	Global Creativity Index	0.920	4
2.2	Nobel+Fields prizes	25	25	5.2	Economic Complexity	1.20	23
2.3	Noble+Fields/cap*	0.696	24	5.3	R&D as % of GDP	1.624	24
3	Avg s	kills		6	Attract	<u>.</u>	
3.1	Avg TIMMS (Gr4)*	n/a	n/a	6.1	Migrant (%)*	20.7	50
3.2	Avg PISA (15yo)*	522	10	6.2	Skilled labour (%)*	44.4	16
3.3	Avg GMAT (age 20-34)	254	23	6.3	GFCI score	707	10
3.4	Avg PIAAC (18+)	565	18	6.4	Mercer QOL index	5	15

\* Half weight within group. \*\* Rank difference between elite skills and average skills (positive value 🗲 elite outperformance)



#### FINLAND

ICI rank: 9

ICI score: 60.45

Skills inequality:\*\* +6

Geography: North Europe

Missing values: 0

IND #	INDICATOR	VALUE	RANK	IND #	INDICATOR	VALUE	RANK
1	Quan	tity		4	Elite skil	ls	
1.1	Primary ER (net)*	99.1	9	4.1	95 <sup>th</sup> TIMMS (Gr4)*	678	13
1.2	Secondary ER (gross)*	107.7	16	4.2	95 <sup>th</sup> PISA (15yo)*	676	6
1.3	Tertiary ER (gross)	93.7	4	4.3	700+ GMAT (age 20-34)	2.8%	65
1.4	Mean yrs schooling	10.3	59	4.4	Top PIAAC (18+)	4.3	1
1.5	Expected yrs schooling	17.1	11				
1.6	GMAT takers/cap*	338.0	13				
2	Qual	lity		5	Creativit	ty	
2.1	Top 500 universities	14	20	5.1	Global Creativity Index	0.917	5
2.2	Nobel+Fields prizes	5	26	5.2	Economic Complexity	1.74	7
2.3	Noble+Fields/cap*	0.9	20	5.3	R&D as % of GDP	3.17%	4
3	Avg s	kills		6	Attract	;	
3.1	Avg TIMMS (Gr4)*	561	6	6.1	Migrant (%)*	5.7	112
3.2	Avg PISA (15yo)*	529	7	6.2	Skilled labour (%)*	44.9	13
3.3	Avg GMAT (age 20-34)	509	65	6.3	GFCI score	619	65
3.4	Avg PIAAC (18+)	268	2	6.4	Mercer QOL index	31	31

\* Half weight within group. \*\* Rank difference between elite skills and average skills (positive value 🗲 elite outperformance)



#### DENMARK

ICI rank: 10

ICI score: 60.25

Skills inequality:\*\* +6

Geography: North Europe

Missing values: 0

IND #	INDICATOR	VALUE	RANK	IND #	INDICATOR	VALUE	RANK
1	Quan	tity		4	Elite skil	ls	
1.1	Primary ER (net)*	98.2	22	4.1	95 <sup>th</sup> TIMMS (Gr4)*	659	20
1.2	Secondary ER (gross)*	124.7	4	4.2	95 <sup>th</sup> PISA (15yo)*	638	29
1.3	Tertiary ER (gross)	79.6	13	4.3	700+ GMAT (age 20-34)	6.9%	31
1.4	Mean yrs schooling	12.7	7	4.4	Top PIAAC (18+)	2.8	8
1.5	Expected yrs schooling	18.7	4				
1.6	GMAT takers/cap*	106.3	50				
2	Quality			5	Creativity		
2.1	Top 500 universities	25	16	5.1	Global Creativity Index	0.917	5
2.2	Nobel+Fields prizes	14	14	5.2	Economic Complexity	1.26	18
2.3	Noble+Fields/cap*	2.4	8	5.3	R&D as % of GDP	3.09%	6
3	Avg s	kills		6	Attract		
3.1	Avg TIMMS (Gr4)*	540	11	6.1	Migrant (%)*	10.1	82
3.2	Avg PISA (15yo)*	498	24	6.2	Skilled labour (%)*	45.8	11
3.3	Avg GMAT (age 20-34)	552	31	6.3	GFCI score	630	53
3.4	Avg PIAAC (18+)	205	22	6.4	Mercer QOL index	9	9

\* Half weight within group. \*\* Rank difference between elite skills and average skills (positive value 🗲 elite outperformance)



# JAPAN

ICI rank: 11

ICI score: 58.91

Skills inequality:\*\* -3

Geography: East Asia

Missing values: 0

IND #	INDICATOR	VALUE	RANK	IND #	INDICATOR	VALUE	RANK
1	Quan	tity		4	Elite skil	ls	
1.1	Primary ER (net)*	100.0	2	4.1	95 <sup>th</sup> TIMMS (Gr4)*	680	12
1.2	Secondary ER (gross)*	101.8	24	4.2	95 <sup>th</sup> PISA (15yo)*	677	5
1.3	Tertiary ER (gross)	61.5	40	4.3	700+ GMAT (age 20-34)	5.7%	41
1.4	Mean yrs schooling	11.5	29	4.4	Top PIAAC (18+)	3.7	3
1.5	Expected yrs schooling	15.3	40				
1.6	GMAT takers/cap*	128.0	41				
2	Qual	lity		5	Creativit	t <b>y</b>	
2.1	Top 500 universities	60	8	5.1	Global Creativity Index	0.708	24
2.2	Nobel+Fields prizes	27	8	5.2	Economic Complexity	2.25	1
2.3	Noble+Fields/cap*	0.2	40	5.3	R&D as % of GDP	3.58%	3
3	Avg s	kills		6	Attract	•	
3.1	Avg TIMMS (Gr4)*	572	3	6.1	Migrant (%)*	1.6	181
3.2	Avg PISA (15yo)*	540	5	6.2	Skilled labour (%)*	24.7	56
3.3	Avg GMAT (age 20-34)	542	41	6.3	GFCI score	728	5
3.4	Avg PIAAC (18+)	280	1	6.4	Mercer QOL index	44	44

\* Half weight within group. \*\* Rank difference between elite skills and average skills (positive value 🗲 elite outperformance)



#### NETHERLANDS

ICI rank: 12

ICI score: 58.74

Skills inequality:\*\* -3

Geography: West Europe

Missing values: 0

IND #	INDICATOR	VALUE	RANK	IND #	INDICATOR	VALUE	RANK
1	Quan	tity		4	Elite skil	ls	
1.1	Primary ER (net)*	97.0	42	4.1	95 <sup>th</sup> TIMMS (Gr4)*	635	34
1.2	Secondary ER (gross)*	129.9	3	4.2	95 <sup>th</sup> PISA (15yo)*	663	13
1.3	Tertiary ER (gross)	77.3	16	4.3	700+ GMAT (age 20-34)	4.9%	46
1.4	Mean yrs schooling	11.9	23	4.4	Top PIAAC (18+)	3.3	4
1.5	Expected yrs schooling	17.9	7				
1.6	GMAT takers/cap*	319.1	14				
2	Qua	lity		5	Creativit	ty	
2.1	Top 500 universities	48	9	5.1	Global Creativity Index	0.889	10
2.2	Nobel+Fields prizes	19	12	5.2	Economic Complexity	1.37	15
2.3	Noble+Fields/cap*	1.1	19	5.3	R&D as % of GDP	1.97%	20
3	Avg s	kills		6	Attract	•	
3.1	Avg TIMMS (Gr4)*	539	12	6.1	Migrant (%)*	11.7	72
3.2	Avg PISA (15yo)*	519	12	6.2	Skilled labour (%)*	47.5	9
3.3	Avg GMAT (age 20-34)	535	46	6.3	GFCI score	664	37
3.4	Avg PIAAC (18+)	264	4	6.4	Mercer QOL index	11	11

\* Half weight within group. \*\* Rank difference between elite skills and average skills (positive value 🗲 elite outperformance)



#### BELGIUM

ICI rank: 13

ICI score: 58.73

Skills inequality:\*\* +2

Geography: West Europe

Missing values: 1



IND #	INDICATOR	VALUE	RANK	IND #	INDICATOR	VALUE	RANK
1	Quan	otity		4	Elite skil	ls	
1.1	Primary ER (net)*	98.3	19	4.1	95 <sup>th</sup> TIMMS (Gr4)*	631	36
1.2	Secondary ER (gross)*	107.3	19	4.2	95 <sup>th</sup> PISA (15yo)*	664	11
1.3	Tertiary ER (gross)	70.8	25	4.3	700+ GMAT (age 20-34)	13.0%	6
1.4	Mean yrs schooling	11.3	34	4.4	Top PIAAC (18+)	2.6	11
1.5	Expected yrs schooling	16.3	19				
1.6	GMAT takers/cap*	172.3	28				
2	Qual	lity		5	Creativit	t <b>y</b>	
2.1	Top 500 universities	35	12	5.1	Global Creativity Index	0.817	18
2.2	Nobel+Fields prizes	13	17	5.2	Economic Complexity	n/a	n/a
2.3	Noble+Fields/cap*	1.2	18	5.3	R&D as % of GDP	2.47%	12
3	Avg s	kills		6	Attract		
3.1	Avg TIMMS (Gr4)*	527	19	6.1	Migrant (%)*	12.3	65
3.2	Avg PISA (15yo)*	510	17	6.2	Skilled labour (%)*	44.7	15
3.3	Avg GMAT (age 20-34)	587	6	6.3	GFCI score	627	56
3.4	Avg PIAAC (18+)	261	7	6.4	Mercer QOL index	22	22

\* Half weight within group. \*\* Rank difference between elite skills and average skills (positive value 🗲 elite outperformance)



#### AUSTRIA

ICI rank: 14

ICI score: 58.66

Skills inequality:\*\* -4

Geography: West Europe

Missing values: 0

IND #	INDICATOR	VALUE	RANK	IND #	INDICATOR	VALUE	RANK
1	Quan	tity		4	Elite skil	ls	
1.1	Primary ER (net)*	98.2	23	4.1	95 <sup>th</sup> TIMMS (Gr4)*	637	32
1.2	Secondary ER (gross)*	97.7	44	4.2	95 <sup>th</sup> PISA (15yo)*	643	24
1.3	Tertiary ER (gross)	72.4	23	4.3	700+ GMAT (age 20-34)	11.2%	10
1.4	Mean yrs schooling	10.8	45	4.4	Top PIAAC (18+)	1.9	16
1.5	Expected yrs schooling	15.7	30				
1.6	GMAT takers/cap*	198.3	25				
2	Qua	lity		5	Creativit		
2.1	Top 500 universities	13	21	5.1	Global Creativity Index	0.788	20
2.2	Nobel+Fields prizes	21	10	5.2	Economic Complexity	1.65	10
2.3	Noble+Fields/cap*	2.5	7	5.3	R&D as % of GDP	3.00%	8
3	Avg s	kills		6	Attract		
3.1	Avg TIMMS (Gr4)*	523	24	6.1	Migrant (%)*	17.5	42
3.2	Avg PISA (15yo)*	501	20	6.2	Skilled labour (%)*	39.9	25
3.3	Avg GMAT (age 20-34)	578	10	6.3	GFCI score	642	43
3.4	Avg PIAAC (18+)	203	24	6.4	Mercer QOL index	1	1

\* Half weight within group. \*\* Rank difference between elite skills and average skills (positive value 🗲 elite outperformance)



#### **NEW ZEALAND**

ICI rank: 15

ICI score: 57.33

Skills inequality:\*\* +4

Geography: Anglo

Missing values: 2



IND #	INDICATOR	VALUE	RANK	IND #	INDICATOR	VALUE	RANK	
1	Quan	tity		4	Elite skil	ls		
1.1	Primary ER (net)*	97.9	29	4.1	95 <sup>th</sup> TIMMS (Gr4)*	654	22	
1.2	Secondary ER (gross)*	119.5	5	4.2	95 <sup>th</sup> PISA (15yo)*	682	3	
1.3	Tertiary ER (gross)	79.8	12	4.3	700+ GMAT (age 20-34)	14.8%	1	
1.4	Mean yrs schooling	12.5	10	4.4	Top PIAAC (18+)	n/a	n/a	
1.5	Expected yrs schooling	19.2	2					
1.6	GMAT takers/cap*	165.3	30					
2	Qual	lity		5	Creativity			
2.1	Top 500 universities	6	29	5.1	Global Creativity Index	0.949	3	
2.2	Nobel+Fields prizes	4	30	5.2	Economic Complexity	0.70	39	
2.3	Noble+Fields/cap*	0.9	21	5.3	R&D as % of GDP	1.17%	33	
3	Avg s	kills		6	Attract			
3.1	Avg TIMMS (Gr4)*	505	31	6.1	Migrant (%)*	23.0	39	
3.2	Avg PISA (15yo)*	509	18	6.2	Skilled labour (%)*	47.4	10	
3.3	Avg GMAT (age 20-34)	595	1	6.3	GFCI score	496	101	
3.4	Avg PIAAC (18+)	n/a	n/a	6.4	Mercer QOL index	3	3	

\* Half weight within group. \*\* Rank difference between elite skills and average skills (positive value  $\rightarrow$  elite outperformance)



# COUNTRY PROFILES (BRICK (BRIC + KAZAKHSTAN))

#### CHINA

ICI rank: 30

ICI score: 47.32

Skills inequality:\*\* -7

Geography: East Asia

#### Missing values: 4



IND #	INDICATOR	VALUE	RANK	IND #	INDICATOR	VALUE	RANK
1	Quan	tity		4	Elite skil	ls	
1.1	Primary ER (net)*	98.3	20	4.1	95 <sup>th</sup> TIMMS (Gr4)*	n/a	n/a
1.2	Secondary ER (gross)*	89.0	74	4.2	95 <sup>th</sup> PISA (15yo)*	712	1
1.3	Tertiary ER (gross)	26.7	83	4.3	700+ GMAT (age 20-34)	13.3%	5
1.4	Mean yrs schooling	7.5	115	4.4	Top PIAAC (18+)	n/a	n/a
1.5	Expected yrs schooling	13.1	95				
1.6	GMAT takers/cap*	154.2	33				
2	Qual	lity		5	Creativit	t <b>y</b>	
2.1	Top 500 universities	88	4	5.1	Global Creativity Index	0.462	61
2.2	Nobel+Fields prizes	13	17	5.2	Economic Complexity	0.74	37
2.3	Noble+Fields/cap*	0.0	68	5.3	R&D as % of GDP	2.10%	17
3	Avg s	kills		6	Attract		
3.1	Avg TIMMS (Gr4)*	n/a	n/a	6.1	Migrant (%)*	0.1	261
3.2	Avg PISA (15yo)*	588	1	6.2	Skilled labour (%)*	11.7	94
3.3	Avg GMAT (age 20-34)	589	5	6.3	GFCI score	693	17
3.4	Avg PIAAC (18+)	n/a	n/a	6.4	Mercer QOL index	101	101

\* Half weight within group. \*\* Rank difference between elite skills and average skills (positive value > elite outperformance)



#### RUSSIA

ICI rank: 31

ICI score: 45.56

Skills inequality:\*\* -3

Geography: East Europe

Missing values: 0

IND #	INDICATOR	VALUE	RANK	IND #	INDICATOR	VALUE	RANK
1	Quan	tity		4	Elite skil	ls	
1.1	Primary ER (net)*	96.1	51	4.1	95 <sup>th</sup> TIMMS (Gr4)*	680	11
1.2	Secondary ER (gross)*	95.3	56	4.2	95 <sup>th</sup> PISA (15yo)*	615	39
1.3	Tertiary ER (gross)	76.1	18	4.3	700+ GMAT (age 20-34)	7.0%	30
1.4	Mean yrs schooling	12.0	20	4.4	Top PIAAC (18+)	2.1	14
1.5	Expected yrs schooling	14.7	53				
1.6	GMAT takers/cap*	58.6	70				
2	Qual	lity		5	Creativit	t <b>y</b>	
2.1	Top 500 universities	8	26	5.1	Global Creativity Index	0.579	38
2.2	Nobel+Fields prizes	36	5	5.2	Economic Complexity	0.98	27
2.3	Noble+Fields/cap*	0.3	36	5.3	R&D as % of GDP	1.19%	32
3	Avg s	kills		6	Attract		
3.1	Avg TIMMS (Gr4)*	554	7	6.1	Migrant (%)*	8.1	97
3.2	Avg PISA (15yo)*	481	39	6.2	Skilled labour (%)*	43.5	17
3.3	Avg GMAT (age 20-34)	553	30	6.3	GFCI score	611	72
3.4	Avg PIAAC (18+)	260	9	6.4	Mercer QOL index	167	167

\* Half weight within group. \*\* Rank difference between elite skills and average skills (positive value 🗲 elite outperformance)



# BRAZIL

ICI rank: 48

ICI score: 36.22

Skills inequality:\*\* +6

Geography: Latin America

Missing values: 4



IND #	INDICATOR	VALUE	RANK	IND #	INDICATOR	VALUE	RANK	
1	Quan	tity		4	Elite skil	ls		
1.1	Primary ER (net)*	87.2	112	4.1	95 <sup>th</sup> TIMMS (Gr4)*	n/a	n/a	
1.2	Secondary ER (gross)*	99.4	35	4.2	95 <sup>th</sup> PISA (15yo)*	552	54	
1.3	Tertiary ER (gross)	25.5	84	4.3	700+ GMAT (age 20-34)	7.2%	29	
1.4	Mean yrs schooling	7.7	108	4.4	Top PIAAC (18+)	n/a	n/a	
1.5	Expected yrs schooling	15.2	43					
1.6	GMAT takers/cap*	31.7	96					
2	Qual	lity		5	Creativity			
2.1	Top 500 universities	13	21	5.1	Global Creativity Index	0.667	29	
2.2	Nobel+Fields prizes	2	37	5.2	Economic Complexity	0.81	32	
2.3	Noble+Fields/cap*	0.0	67	5.3	R&D as % of GDP	1.15%	34	
3	Avg s	kills		6	Attract			
3.1	Avg TIMMS (Gr4)*	n/a	n/a	6.1	Migrant (%)*	0.3	244	
3.2	Avg PISA (15yo)*	402	65	6.2	Skilled labour (%)*	21.3	63	
3.3	Avg GMAT (age 20-34)	554	29	6.3	GFCI score	639	46	
3.4	Avg PIAAC (18+)	n/a	n/a	6.4	Mercer QOL index	107	107	

\* Half weight within group. \*\* Rank difference between elite skills and average skills (positive value 🗲 elite outperformance)



#### KAZAKHSTAN

ICI rank: 52

ICI score: 35.05

Skills inequality:\*\* -1

Geography: Central Asia

Missing values: 2



IND #	INDICATOR	VALUE	RANK		IND #	INDICATOR	VALUE	RANK
1	Quantity				4	Elite skills		
1.1	Primary ER (net)*	85.6	118		4.1	95 <sup>th</sup> TIMMS (Gr4)*	639	31
1.2	Secondary ER (gross)*	97.7	42		4.2	95 <sup>th</sup> PISA (15yo)*	547	59
1.3	Tertiary ER (gross)	44.5	61		4.3	700+ GMAT (age 20-34)	1.8%	81
1.4	Mean yrs schooling	11.4	32		4.4	Top PIAAC (18+)	n/a	n/a
1.5	Expected yrs schooling	15.0	48					
1.6	GMAT takers/cap*	56.8	71					
2	Quality				5	Creativity		
2.1	Top 500 universities	0	45		5.1	Global Creativity Index	0.357	84
2.2	Nobel+Fields prizes	0	72		5.2	Economic Complexity	0.34	52
2.3	Noble+Fields/cap*	0.0	72		5.3	R&D as % of GDP	0.17%	79
3	Avg skills				6	Attract		
3.1	Avg TIMMS (Gr4)*	498	34		6.1	Migrant (%)*	20.1	41
3.2	Avg PISA (15yo)*	417	53		6.2	Skilled labour (%)*	32.7	39
3.3	Avg GMAT (age 20-34)	491	81		6.3	GFCI score	597	82
3.4	Avg PIAAC (18+)	n/a	n/a		6.4	Mercer QOL index	175	175

\* Half weight within group. \*\* Rank difference between elite skills and average skills (positive value 🗲 elite outperformance)



# INDIA

ICI rank: 66

ICI score: 29.36

Skills inequality:\*\* +25

Geography: South Asia

Missing values: 4

IND #	INDICATOR	VALUE	RANK		IND #	INDICATOR	VALUE	RANK
1	Quantity				4	Elite skills		
1.1	Primary ER (net)*	85.6	118		4.1	95 <sup>th</sup> TIMMS (Gr4)*	639	31
1.2	Secondary ER (gross)*	97.7	42		4.2	95 <sup>th</sup> PISA (15yo)*	547	59
1.3	Tertiary ER (gross)	44.5	61		4.3	700+ GMAT (age 20-34)	1.8%	81
1.4	Mean yrs schooling	11.4	32		4.4	Top PIAAC (18+)	n/a	n/a
1.5	Expected yrs schooling	15.0	48					
1.6	GMAT takers/cap*	56.8	71					
2	Quality				5	Creativity		
2.1	Top 500 universities	0	45		5.1	Global Creativity Index	0.357	84
2.2	Nobel+Fields prizes	0	72		5.2	Economic Complexity	0.34	52
2.3	Noble+Fields/cap*	0.0	72		5.3	R&D as % of GDP	0.17%	79
3	Avg skills				6	Attract		
3.1	Avg TIMMS (Gr4)*	498	34		6.1	Migrant (%)*	20.1	41
3.2	Avg PISA (15yo)*	417	53		6.2	Skilled labour (%)*	32.7	39
3.3	Avg GMAT (age 20-34)	491	81		6.3	GFCI score	597	82
3.4	Avg PIAAC (18+)	n/a	n/a		6.4	Mercer QOL index	175	175

\* Half weight within group. \*\* Rank difference between elite skills and average skills (positive value 🗲 elite outperformance)



