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AMERICA'S BRAINPOWER UP TO 2050

A Democrat in the White house is expected to focus on two core projects: (1) He is to keep the earth as cold as possible (https://www.bbc.com/news/science-environment-54858638) and (2) he is to remove legal barriers for migrants on the nation's southern border (https://www.migrationpolicy.org/). The first project is particularly popular in Canada and Western Europe.

MATHEMATICAL LOW ACHIEVERS PER 1,000 15-YEAR-OLDS (*levels 1 and 0* in PISA 2018)
in the world's 72 economically leading nations with more than one million inhabitants.
(Data: https://www.oecd-ilibrary.org/docserver/79c489df-en.pdf?expires=1604694280&id=id&accname=guest&checksum=7873D34C9E70474BD3C2FC3A387E95B7.)

20-144/1,000 15-year-olds	145-159/1,000 15-year-olds	160-199/1,000 15-year-olds	200-249/1,000 15-year-olds	250-369/1,000 15-year-olds	370-519/1,000 15-year-olds	520-650/1,000 15-year-olds	651-920/1,000 15-year-olds
China (**24**)	Poland (**147**)	Canada (**163**)	Czech R. (**204**)	Slovakia (**251**)	Serbia (**397**)	Thailand (**527**)	Colombia (**654**)
[4 select provinces]	Denmark (**148**)	Slovenia (**165**)	Austria (**211**)	Hungary. (**257**)	Malaysia (**415**)	Qatar (**537**)	Brazil (**681**)
Macao (**50**)	Finland (**149**)	Switzerland (**168**)	Germany (**211**)	Lithuania (**257**)	Albania (**424**)	Mexico (**563**)	Argentina (**690**)
Singapore (**71**)	S-Korea (**150**)	Latvia (**173**)	France (**212**)	**USA (271)**	U. Arab E. (**453**)	Bos+Herz (**576**)	S-Arabia (**697**)
Hongkong (**92**)	Ireland (**157**)	Sweden (**188**)	Russia (**217**)	Belarus (**294**)	Romania (**465**)	Jordan (**593**)	Indonesia (**719**)
Estonia (**102**)	Netherl. (**157**)	Norway (**189**)	N-Zealand (**218**)	Croatia (**312**)	Kazakhst. (**491**)	Lebanon (**598**)	Morocco (**756**)
Japan (**115**)	Vietnam (**157**)	U-Kingdom (**192**)	Australia (**224**)	Greece (**358**)	Moldova (**503**)	Costa Rica (**600**)	Kosovo (**766**)
Taiwan (**140**)		Belgium (**197**)	Portugal (**233**)	Ukraine (**359**)	Uruguay (**507**)	Peru (**603**)	Philippin. (**807**)
			Italy (**239**)	Turkey (**367**)	Azerbaijan (**508**)	Georgia (**610**)	Panama (**812**)
Gunnar Heinsohn 11/20			Israel (**241**)		Chile (**519**)	N-Maced. (**610**)	Dominic.R(**906**)
			Spain (**247**)				

The second goal is primarily pleasing in Latin America, where, according to Gallup (2017), some 27 percent, i.e. more than 180 of the 660 million inhabitants, want to emigrate (https://news.gallup.com/poll/245255/750-million-worldwide-migrate.aspx). It cannot be any different, because their home territories are trapped in premature de-industrialization (https://www.vox.com/a/new-economy-future/premature-deindustrialization). Their relatively basic industries are wiped out by Asian competition offering better quality for lower price. Subsequently, they are not able to switch to high-tech industries because they lack the high-skilled specialists for innovation and its implementation (next table, last two columns). In the USA, on the other hand, less well educated migrants – not only from Latin America and the Caribbean but from all over the world – still have access to a wide range of social programs.

Both of the American Democrats' main projects attract the highest attention from the 1.7 billion people in East Asia. For them, the earth is cool enough. And since their borders are only open to high-skilled foreigners, they welcome America's noble admission of the downtrodden. That allows

them to optimize their competitive edge because America – with less than one-twentieth of East Asia's high-tech talent (table below) – ties its increasingly scarce talents to climate activities.

Both tables focus on children of 15 years or younger, because they do not have to be predicted, but are already born and determine the winners or

BRIGHTEST MATH STUDENTS PER 1,000 15-YEAR-OLDS (*Level 6* in PISA 2018) in the 72 leading nations (> 1 mill. inhabitants)

The figure below the share shows the TOTAL NUMBER OF BRIGHTEST MATH STUDENTS for all children from 0-14 in 2019, assuming that the younger ones will perform as well as the 15-year-olds of 2018.

(Data: https://www.oecd-ilibrary.org/docserver/79c489df-en.pdf?expires=1604694280&id=id&accname=guest&checksum=7873D34C9E70474BD3C2FC3A387E95B7; Population under 15: https://data.worldbank.org/indicator/SP.POP.0014.TO.)

43-170/1,000 15-year-olds	**28-42/1,000 15-year-olds**	**21-27/1,000 15-year-olds**	**14-20/1,000 15-year-olds**	**6-13/1,000 15-year-olds**	**2-5/1,000 15-year-olds**	**1/1,000 15-year-olds**	**< 1/1,000 15-year-olds**
Math aces < 15 years	***Math aces < 15 years***	***Math aces <15 years***	***Math aces <15 years***	***Math aces <15 years***	***Math aces <15 years***	***Math aces <15 years***	***Math aces < 15 years***
China [4 prov.] (**165**) ***41,000,000****	Poland (**41**) ***238,000***	N-Zealand (**27**) ***25,970***	Italy (**20**) ***158,800***	U. Arab E. (**12**) ***17,260***	Greece (**5**) ***7,450***	Bos+Herz (**1**) ***485***	Argentina ***n.a.***
Singapore (**138**) ***97,000***	Canada (**40**) ***240,000***	Sweden (**26**) ***47,100***	Finland (**18**) ***15.910***	Spain (**11**) ***75,900***	Moldova (**4**) ***1,690***	Brazil (**1**) ***44,340***	Colombia ***n.a.***
Hongkong (**95**) ***88,000***	Estonia (**37**) ***5,880***	Australia (**25**) ***122,500***	France (**18**) ***214,900***	Vietnam (**11**) ***246,400***	Romania (**4**) ***12,060***	Chile (**1**) ***3,700***	Costa Rica ***n.a.***
Macao (**77**) ***7,500***	Belgium (**32**) ***67,720***	Austria (**25**) ***31,750***	Israel (**18**) ***45,000***	Ireland (**10**) ***10,450***	Albania (**3**) ***1,490***	Georgia (**1**) ***745***	Dominican R ***n.a.***
Taiwan (**76**) ***250,000***	Czech R (**31**) ***52,080***	Portugal (**25**) ***34,000***	Lithuania (**17**) ***7,170***	Serbia (**10**) ***10,790***	Azerbaijan (**3**) ***7,050***	Jordan (**1**) ***3,900***	Indonesia ***n.a.***
S-Korea (**69**) ***455,000***	Slovenia (**31**) ***9,770***	Norway (**24**) ***22,340***	Russia (**15**) ***393,000***	Ukraine (**10**) ***70,000***	Kazakhstan (**3**) ***16,040***	N-Macedon. (**1**) ***342***	Mexico ***n.a.***
Switzerland (**49**) ***63,700***	U Kingdom (**31**) ***366,730***	Slovakia (**23**) ***19,480***	**USA (15)** ***915,000***	Bulgaria (**9**) ***9,220***	Lebanon (**3**) ***5,250***	Peru (**1**) ***8,210***	Kosovo ***n.a.***
Japan (**43**) ***688,000***	Germany (**28**) ***322,000***	Denmark (**21**) ***20,030***	Hungary (**14**) ***19,740***	Turkey (**9**) ***182,700***	Malaysia (**3**) ***22,710***	Uruguay (**1**) ***708***	Morocco ***n.a.***
Netherlands (**43**) ***188,250***			Latvia (**14**) ***4,370***	Croatia (**8**) ***4,740***	Thailand (**3**) ***35,140***		Panama ***n.a.***
				Qatar (**6**) ***2,310***			Philippines ***n.a.***
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* If one takes a value for China of, say, 80/1000 (i.e. closer to Taiwan or Macao), the total would be only ca. ***20,000,000 math aces*** younger than 15 years.

losers of tomorrow. The 15-year-old aces of 2018 will only be 47 years old in 2050. The very young ones of today will only really get going then However, since the table above transfers the performances of 2018's 15-year old to all younger children up to the newborns, it might look too optimistic for quite a few Western countries. After all, most of them have lost places rather than caught up since the start of the PISA studies in 2000. The United States has been hit hardest with a drop from 24 to 36 since 2003. Other First World countries – such as Germany and France – have, at least since the 1960s, replaced emigrated highly qualified people by less-skilled foreigners. This cannot help but affect their future PISA ranks. Americans will probably find their loss of competence even more painful than their choice of presidents.

America's long-lasting technological lead over China is mainly explained by its earlier and better protection of property and creditor-debtor contracts. If one rates the ownership culture on a scale of 1 to 4, the USA – like Germany and Japan – are at the highest level, while China and

MATRIX OF ECONOMIC SUCCESS

COMPETENCE [rules the roost] – LIFE – PROPERTY – LIBERTY – FERTILITY [shared problem]. Competence can barely be influenced. Fertility is difficult to increase. The remaining factors can be more easily modified. As China is trailing in all of them, it has the most to gain

Population: China 1440 mill.; USA 331 mill.; Japan 126 mill.; Germany 83 mill.; S-Korea 51 mill.

COMPETENCE [brightest math students per 1,000 fifteen-year-olds in **PISA 2018** level 6; https://www.oecd-ilibrary.org/docserver/79c489df-en.pdf?expires=1604694280&id=id&accname=guest&checksum=7873D34C9E70474BD3C2FC3A387E95B7]	LIFE [**Rule of law** Index: https://worldjusticeproject.org/sites/default/files/documents/ROLI-2019-Reduced.pdf	PROPERTY [2019: https://knoema.de/atlas/topics/Weltrankings/Weltrankings/International-**Property-Rights-Index**]	LIBERTY [https://www.eiu.com/public/topical_report.aspx?campaignid=**democracyindex**2019]	FERTILITY [Children in a woman's lifetime 2018 or 2019 https://www.cia.gov/library/publications/the-world-factbook/fields/356.html}
China [4 select prov.] **(165/1000)** **Taiwan (79/1000)***	**Germany (0.80)**		**Germany (8.68)** **Korea S. (8.00)**	
Korea S. (69/1000)	**Japan (0.78)** **Korea S. (0.77)**	**Japan (8.3)** **USA (8.2)**	**Japan (7.99)** **USA (7.96)**	
Japan (43/1000)	**USA (0.71)**	**Germany (7.9)**		
		Korea-S. (6.6)		**USA (1.73)**
Germany (28/1000)		**China (6.0)**		**China (1.60)**
USA (15/1000)	**China (0.45)**			**Germany (1.47)**
			China (2.26)	**Japan (1.43)**
				Korea S. (1.29)

* Taiwan may be more representative for the whole of China than its 4 selected provinces taking part in PISA 2018. China's lead in competence over the USA per 1,000 students is thus 5:1 rather than 11:1. Combined with China's four times larger population, this gives an overall lead over the USA not of 44:1, but only of c. **20:1**.

South Korea, with a score of 3, reach only 75 percent thereof. Nevertheless, the top nations are now operating on a nearly level playing field. This means that nations with higher cognitive competence will – not immediately, but steadily – pass the lower-ranking ones. This can be seen particularly clearly in the PCT-patent applications between 1994 and 2019. Germany, with its 80 million inhabitants, turned its 22:1 lead of 1994 over 50 million South Koreans into a meagre 1:1 by 2019. The USA outperformed China by a factor of 150 in 1994, but in 2019 only came second behind the Middle Kingdom. If America cannot make up its 1:20 talent gap with China, the latter's march to the world's economic top will become inevitable.

PCT patent applications of the global top five 1994 to 2019 (green 1st; blue 2nd; yellow 3rd.
(Total population (TP), median age (MA), credit rating [Trading Economics Points])
[https://www.worldometers.info/world-population/; Mai 2020]; https://tradingeconomics.com/country-list/ratinghttps://www.wipo.int/publications/en/details.jsp?id=4027&plang=EN; https://www.wipo.int/edocs/infogdocs/en/ipfactsandfigures2019/]. Gunnar Heinsohn 11-2020

Year	USA TP 331 mill. MA 38.5 [Whites 44] 98 TEP	GERMANY TP 84 mill. MA 44.5 100 TEP	JAPAN TP 127 mill. MA 48.6 77 TEP	SOUTH KOREA TP 51 mill. MA 43.2 86 TEP	CHINA TP 1440 mill. MA 38.4 80 TEP
1994	14,798	4,294 22	2,290	190 :1	98 [1st time]
1995	16,588	5,054	2,700	192	106
2000	38,171	12,039	9,402	1,514	579
2005	46,019	15,995	24,815	4,685	2,500
2010	44,890	17,558	32,180	9,668	12,295
2013	57,239	17,927	43,918	12,386	21,516
2015	57,385	18,072	44,235	14,626	29,846
2017	56,624	18,982	48,208	15,763	48,882
2019	57,840 x 3.9/25 yrs.	19,353 1 x 4.5/25 yrs.	52,660 x 23/25 yrs.	19,085 :1 x 100/25 yrs.	58,990 x 602/25 yrs.

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