

## Influence of Per-capita GDP on the ISO OOXML Vote

A Report from the  
Digital Standards Organization ISO Working Group

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It is generally accepted that one of the main economic indicators of any country is its Gross Domestic Product (GDP) per capita. This indicator measures the country's economic capacity to generate wealth, divided by the number of its citizens.

The GDP per capita is known to be positively correlated with other key country development indicators like average education levels, health care system coverage, social welfare protection, etc.<sup>1</sup>

In face of the recent and ongoing turmoil regarding the ISO DIS 29500 standard proposal also known as Microsoft OOXML [2], we decided to investigate whether the recent voting process reveals any asymmetry between the GDP per capita of two different pools of countries - those who voted for the approval of OOXML and those who voted against it.

We collected the most recent GDP per capita figures (adjusted to the Purchase Power Parity), available at the International Monetary Fund website [4] and applied a Wilcoxon rank sum test to the data (with normal approximation)<sup>2</sup>. We also added Cuba to this list, using the CIA Fact Book latest figures [6].

By doing this we were able to reject the hypothesis that "there is no significant difference between the average GDP per capita of countries who voted for OOXML and countries who voted against it" in favor of the alternative hypothesis: **"The average GDP per capita of the countries who voted for the OOXML proposal is significantly lower than the GDP per capita of those who voted against it"**. In fact, the p-value of the test is 1.01%.

Moreover, this is not a slight difference. **The average GDP per capita (adjusted to PPP) of the countries who approved the proposed text amounts to 13843 USD, while the same figure for countries who voted against it amounts to 23297 USD. That represents a difference of almost 10000 USD per capita.**

Countries with lower GDP per capita usually have weaker institutions representing its citizens and weaker economies that depend more strongly on foreign multinationals. For instance, the correlation between the Corruption Perceptions Index from Transparency International [7] and the GDP per capita is of 0.8322.

As we know Microsoft was until recently the biggest company on the planet, so it's natural to wonder whether its lobbying power has anything to do with the the approvals by some less developed countries. Although nothing in that regard can be directly obtained from these numbers,

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<sup>1</sup>As an illustrative example, Annex 2 includes two graphs relating the GDP per capita figures as stated by the IMF World Economic Outlook Database with primary school completion levels and health care expenditures, as found in the World Bank Group study: "World Development Indicators, 2006". As expected, positive correlations are found in both cases: 0.336 for the education indicator and 0.579 for the health care indicator. The skeptical reader is encouraged to look into many other possible relations using the vast sample of development indicators available in the World Bank Group website.

<sup>2</sup>A similar approach was already used by EFFI for the correlation between the OOXML vote and the CPI. Please see reference [3].

recent news about the last minute influx of participating members<sup>3</sup> on the ISO JTC1 working group suggests there is something unusual going on [8].

It should be noted that normalization processes are usually built upon consensus and controversies such as the one surrounding DIS 29500 are highly uncommon.<sup>4</sup> If we look at the ballot results for other recently approved standards such as ISO 26300 (Open Document Format) [10] and ISO 32000 (Portable Document Format) [11] we'll find a near 100% approval rate.

The scenario for DIS 29500 clearly stands out from the usual consensus. We have shown that there is a strong correlation between per-capita GDP and voting patterns on OOXML, and other studies have shown the strong correlation between per-capita GDP and corruption. We sincerely hope that ISO acknowledges the full implications of the results of our study and moves forward to ensure transparency and rigor on the normalization activities.

### About Digistan

The Digital Standards Organization was founded by a group of open standards professionals in 2007 with the goal of promoting customer choice, vendor competition, and overall growth in the global digital economy through the understanding, development, and adoption of open digital standards. For more information, see [www.digistan.org](http://www.digistan.org).

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<sup>3</sup>P-members are countries who have a long term involvement with ISO and for which participation is mandatory. Just before the ballot the following countries applied for p-membership: Malta, Venezuela, Pakistan, Poland, Egypt, Lebanon, New Zealand, South Africa, Ecuador, Jamaica and Uruguay, 8 of which voted for approval.

<sup>4</sup>In fact, the ISO voting rules [9] demand an approval by more than 2/3 of the p-members and less than 1/4 of disapproval votes among all voting members.

References:

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[http://www.infoworld.com/article/07/12/05/PDF-approved-as-international-standard\\_1.html](http://www.infoworld.com/article/07/12/05/PDF-approved-as-international-standard_1.html)

Influence of Per-capita GDP on the ISO OOXML Vote

Annex 1: data and test results

Country	Vote	GDP per Capita (PPP Adjusted)	Primary Completion Rate in 2004 (% of total population)	Health Expenditure in 2003 (% of GDP)
Luxembourg	Abstention	\$87,399.53		
Ireland	Disapproval	\$47,168.67	101	7.3
Norway	Disapproval	\$47,097.60	103	10.3
United States	Approval with comments	\$44,764.59		15.2
Switzerland	Approval with comments	\$40,590.32	96	11.5
Qatar	Approval	\$38,671.53		
Austria	Approval with comments	\$38,473.61		7.5
Denmark	Disapproval	\$38,437.56	103	9
Netherlands	Abstention	\$38,252.48	100	9.8
Finland	Abstention	\$37,956.97	102	7.4
United Kingdom	Disapproval	\$37,328.17		8
Canada	Disapproval	\$36,983.95		9.9
Belgium	Abstention	\$36,354.73		9.4
Singapore	Approval with comments	\$36,285.68		4.5
United Arab Emirates	Approval	\$35,516.11	75	3.3
Greece	Approval with comments	\$35,166.97		9.9
Australia	Abstention	\$34,943.49	100	9.5
Japan	Disapproval	\$34,023.94		7.9
Israel	Abstention	\$33,299.24	101	8.9
France	Disapproval	\$33,077.84		10.1
Germany	Approval with comments	\$33,022.73	97	11.1
Italy	Abstention	\$32,319.32	103	8.4
Cyprus	Approval	\$31,521.80		
Spain	Abstention	\$29,147.95		7.7
New Zealand	Disapproval	\$26,994.16		8.1
Slovenia	Abstention	\$26,576.03	102	8.8
Korea	Disapproval	\$25,839.89		5.8
Czech Republic	Disapproval	\$25,345.86	102	7.5
Portugal	Approval with comments	\$23,866.59		9.6
Malta	Approval with comments	\$23,454.10		
Kuwait	Approval	\$21,418.00	91	3.5
Barbados	Approval	\$20,532.24		
Trinidad and Tobago	Abstention	\$18,974.68	94	3.9
Argentina	Abstention	\$17,558.87	102	8.9
Saudi Arabia	Approval	\$17,195.53	62	3.3
Poland	Approval with comments	\$16,598.77	100	6.5
Croatia	Approval	\$15,733.14	91	7.8
Mauritius	Abstention	\$14,152.63	100	3.7
South Africa	Disapproval	\$13,844.74	96	8.4
Chile	Abstention	\$13,744.51	97	6.1
Russia	Approval	\$13,432.18		5.6
Uruguay	Approval with comments	\$12,916.81	94	9.8
Malaysia	Abstention	\$12,754.47	95	3.8
Costa Rica	Approval	\$12,682.97	92	7.3
Mexico	Abstention	\$11,879.67	97	6.2
Romania	Approval	\$11,079.08	90	6.1
Bulgaria	Approval with comments	\$10,972.60	97	7.5
Kazakhstan	Approval	\$10,658.36	110	3.5
Brazil	Disapproval	\$10,636.66	111	7.6
Belarus	Approval	\$10,167.26	101	6.4
Bosnia and Herzegovina	Approval	\$9,964.07		9.5
Turkey	Approval with comments	\$9,815.55		7.6

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Thailand	Disapproval	\$9,714.50		3.3
Tunisia	Approval with comments	\$9,629.84	94	5.6
Panama	Approval	\$9,395.26	97	7.6
Iran, Islamic Republic of	Disapproval	\$9,127.16	95	6.5
Colombia	Approval with comments	\$8,891.18	94	7.6
China	Disapproval	\$8,788.23	99	5.6
Ukraine	Approval	\$8,624.46	91	5.7
Azerbaijan	Approval	\$8,520.60	96	3.6
Venezuela	Approval with comments	\$8,124.72	89	4.5
Peru	Abstention	\$7,409.96	96	4.4
Serbia	Approval	\$7,265.16	96	9.6
Fiji	Approval	\$6,031.87		
Morocco	Approval	\$6,003.26	67	5.1
Lebanon	Approval	\$5,964.89	94	10.2
Jordan	Approval with comments	\$5,963.74	97	9.4
Sri Lanka	Approval	\$5,838.90		3.5
Armenia	Approval	\$5,768.83	107	6
Philippines	Disapproval	\$5,738.36	98	3.2
Egypt	Approval	\$5,272.28	93	5.9
Ecuador	Disapproval	\$5,021.19	101	5.1
Jamaica	Approval	\$4,653.64	84	5.3
Syrian Arab Republic	Approval	\$4,498.22	107	5.1
India	Disapproval	\$4,182.86	84	4.8
Cuba	Approval	\$4,100.00	93	7.3
Vietnam	Abstention	\$3,716.33	101	5.4
Ghana	Approval with comments	\$2,963.23	65	4.5
Pakistan	Approval	\$2,942.50		2.4
Uzbekistan	Approval	\$2,540.81	98	5.5
Zimbabwe	Abstention	\$2,395.07	80	7.9
Bangladesh	Approval	\$2,270.15	73	3.4
Côte d'Ivoire	Approval	\$1,725.60	43	3.6
Kenya	Approval with comments	\$1,455.58	89	4.3
Nigeria	Approval	\$1,280.79	76	5
Congo, Democratic Republic of	Approval	\$893.18		4
Tanzania	Approval	\$869.00	57	4.3

**Sample 1 (Countries that disapproved):**

$$N1=18$$
$$W1=800$$

**Sample 2 (Countries that approved):**

$$N2=51$$
$$W2=1615$$

**Wilcoxon statistic (Normal approximation):**

$$\mu_{W1} = \frac{N1 \cdot (N1 + N2 + 1)}{2} = 630$$

$$\sigma_{W1} = \sqrt{\frac{N1 \cdot N2 \cdot (N1 + N2 + 1)}{12}} = 73.178$$

$$Z = \frac{W1 - \mu_{W1}}{\sigma_{W1}} = 2.3231$$

$$p \text{ value} = 0.010087$$

Annex 2 – World Development Indicators and GDP per Capita

