BOEC (Back Of the Envelope Calculations) Working Paper Series: for USL1 (1.0)

I. **USL1: To create global movements that will have snowball effects for everything we do for 5Es (Education, Economy, Energy, Environment & Empowerment) by unifying them all.**

II. **5UEs (Unified 5Es): to resolve the 5+2 toughest global crises/challenges of our time corresponding to each of 5Es within next 20-30 years. (At least 90%)**

III. **URF1 (Unified Redistribution Fund): These are designed to lead us to create a new UN-led, binding international treaty to resolve them all.**

These papers will provide the easily digestible & short explanations and mechanisms about USL1 primarily targeted to the policy-makers and –shapers (in governments, NGOs, & the UN).

(BOEC Working Paper Series 1)

Why and How USL1 roughly halves the GDP (per capita) growth doubling time? For the cases of the world, OECD, and the U.S.A.

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ABSTRACT

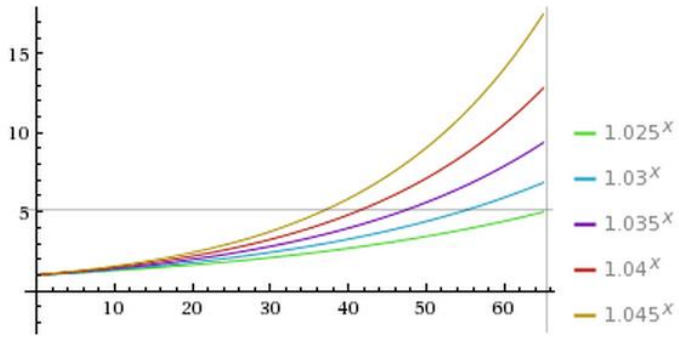
In this paper, as the first part of BOEC series, we compiled several different ways to show how USL1 can roughly halve the GDP (per capita) growth rates of countries, or equivalently speaking, how USL1 roughly double their growth rates. The first and easiest one simply focuses on the world average, which is about 3.5% and the U.S.A. or OECD average GDP growth rate, which is about 2.5% for the past 5 years or so. We compare the results with the projections by Hanushek-Woessmann from the UNESCO paper simulation. The Hanushek-Woessmann simulated projection growth values seem about 25-30% less than those from our simplified estimation values.

CONTENTS

PART 1: the simplest estimations for the U.S.A. and OECD countries

(Since us didn´t take into account of the population growth rates here) the estimates here are relatively low value estimations. The actual USL-induced growths will be higher.

The U.S.A. or OECD´s average GDP growth rate, which is about 2.5% for the past 5 years or so. So we did the simplest possible, no brainer estimations. USL 0.5 (by advancing 1 year school math) is supposed to add about 1% (Real) GDP per capita. Instead of dealing with more complexity and other variables such as the population growth rates, etc., we just added 1% more for USL 0.5 and 2% more to the growth rates for USL1 as you can see in the figures below. The light green is the current U.S.A. GDP growth rate of about 2.5% as the baseline to be compared with. The blue is the GDP growth after 1 year school math advancement (after USL 0.5) by adding 1% more becoming 3.5% growth rate annually. The orange is the GDP growth after 2 year school math advancement (after USL 1.0) by adding 2% more (possibly slightly over-estimating realistically) becoming 4.5% growth rate annually. The pink is the GDP growth after 2 year school math advancement (after USL 1) by adding only 1.5% more (in case there are various hiccups during the reforms, etc.) becoming 3% growth rate annually.



Only this chart has the USL 0.25-induced projection included by adding 0.5% more the baseline USA GDP growth in the color aqua. As you can see it sits between USA growth rate (2.5%) and USL 0.5. The rest of charts will not include the USL 0.25 projection.

Figure 1.

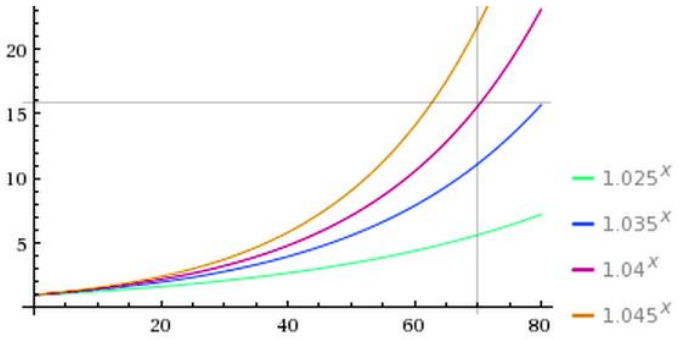


Figure 2.

As you can see, as time goes on, USL 0.5 will increase the USL GDP 30-50-100% more to the USA economy annually. USL 1.0 will increase 2x-3x-4x and even conservatively 2x-2.5x as time goes on. Now let´s zoom in to see in only 20 years or 35 years after USL 0.5, 1´s quick reforms for a few or several years, idealistically supposing that the world embrace this year 2015.

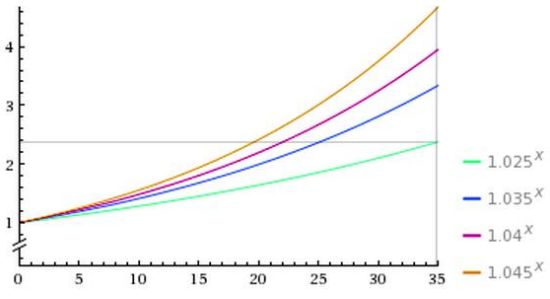


Figure 3.
In 35 years (2050), compared to the U.S.A. GDP, USL 0.5 will induce about 35% higher than the U.S. without USL reforms. USL1 will be maximally about 2x larger and the medium gains will be still about 1.6x larger than the U.S.A. GDP without USL1.

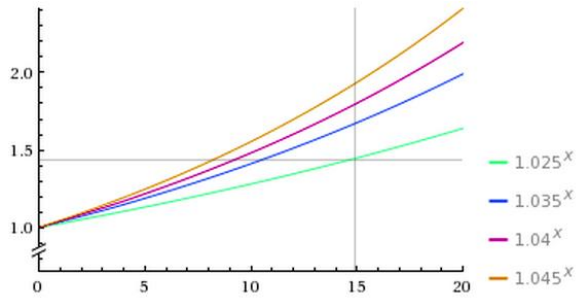


Figure 4.
In 20 years (2035), compared to the U.S.A. GDP, USL 0.5 will induce about 70% higher than the U.S. without USL reforms. USL1 will be maximally about 2x larger and the medium gains will be still about 50% larger than the U.S.A. GDP without USL1.

PART 2: the estimations based on the original Hanushek-Woessmann projections in their UNESCO paper.

They only dealt with the reform times for 20 and 10 years, not less than 5 years that USL series is pushing and they are projected into 80 years in the future. So their estimates will be significantly lower than our simple-minded estimation above. We put this so that the readers can get the sense of the variations of the different estimations for the global GDP changes after the USL1-reforms.

Table 2. Present Value of future gains relative to current GDP

	Speed of reform:		Change in long-run growth rate
	20 years	10 years	(independent of duration of reform)
+25 points on PISA	308%	375%	0.50%
+50 points on PISA	664%	815%	0.99%
+20 percent more at 400 points	342%	417%	0.55%
+75 percent more at 400 points	1634%	2048%	2.05%

Source: Hanushek-Woessmann paper from UNESCO

(Hanushek & Woessmann, 2011)

Our adaptation of the above table:

	20 yr. reform	10 yr. reform	5 yr. reform

USL 0.25 (boosting 0.5 year of national average of school math)	3.08x	3.75x	About 4.1x-4.5x?
USL 0.5 (boosting 1 year of national average of school math)	6.7x	8.15x	About 10x?
The average of OECD, the U.S.A. & EU (20% below 400)	3.4x	4.2x	5x?
SSA or SA (75% below 400)	16.3x	20.5x	25x?

Note: the 400 points (of the third and fourth rows) are roughly the typical PISA average math scores in most of the Latin American countries where majority of students, say 60-80% or so get below 400 points. What the data means is that if these countries can boost most their students´ math scores (or science, etc.) rise above 400, then its GDP contributions will be given as above.

So in countries where 75% of their students are below (as in many Latin American countries, SSA or SA countries) PISA or TIMSS below 400 points and if the USL 0.5 or 1 can do make most of them rise above 400 points, then this alone will add the surplus 2% of their annual GDP growth rates.

The third row is mostly relevant for the majority of the OECD, including the U.S.A. or EU countries (excluding the Far Eastern Asian countries where the 400 below are less than 10% of the student populations). Typically, in these more developed countries, the number of students with the below 400 points tend to be 20% more or less. So lifting all the worst performing math students from below to above 400 alone will raise the GDP growth rates more than USL 0.25 impacts.

From the UNESCO paper table on the far right column, we can see its long run GDP growth rate contribution is about 2% and its 10 year reform will boost the current economy by about 20x and 20 year reform will boost by about 16x. If you compare these values of our simple-minded projection in Figure 2, the 65th year projection of the part 1 is roughly equivalent to the Hanushek-Woessmann projections in their UNESCO paper. If you look at the Figure 2 of Part 1 carefully comparing its GDPs in the 65th year and the 80th year, we can roughly say that their values are about 25-30% lower than the values in Figure 2 of Part 1.

REFERENCES

Hanushek-Woessmann papers from UNESCO (Global Monitoring Report 2012):

Hanushek, E. A., & Woessmann, L. (2011). *Education For All: Global Monitoring Report (2012/ED/EFA/MRT/PI/01).* Obtenido de http://www.unesco.org/: http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/ED/pdf/gmr2012-ED-EFA-MRT-PI-01.pdf