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Redefining the Economical Power of Nations

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Redefining the Economical Power of Nations

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Abstract

The paper challenges the perceived equality of economies¹ and introduces a set of hypothetical Indexes based on the factors GDP, GINI Coefficient and Inflation. This **Social factors relativized GDP cuts out that part of the GDP, which is structurally long term frozen up by social transfers**. The first part of the paper explains the factors used in the K_index, as well as the reason for the choice. The second part of the paper shows variations of the K_Index including a few ideal typical examples. The final part asks some critical questions and concludes the paper.

Basic social factors relativized GDP: $GDP - GDP \times GINI$ is $(1 - GINI) \times GDP = K_Index$
Inflation indexed Version: $(1 - GINI - Inflation) \times GDP = K_Index_Infl.$

Productivity Index: $K_Index / Labor\ Force = K_PROD$
Inflation indexed Productivity Index: $K_Index_Infl. / Labor\ Force = K_PROD_Infl.$

Debt-to-K_Index: $National\ debt / K_Index = K_Debt$
Debt-to-K_Index_Infl: $National\ debt / K_Index_Infl. = K_Debt_Infl.$

JEL Classification: E010, E10, O11, C02, C01, E01, F02, C10, C50

Keywords: Economic Indicator, GDP, GNP, GINI, Productivity, Inequality, Income Distribution, Poverty Growth, Poverty Measurement, Macro Models, International Economic Order, International Industrial Order, Econometrics, Econometric Methods, Econometric Modeling, Macroeconomics, Mathematical Methods, Mathematical Models, Numerical Methods, National Income and Product Account, Economic Growth, Wage, Economic Growth, Multisector Growth, Saving Growth, Aggregate Productivity, Gross National Product, Gross Domestic Product, Macroeconomic Model, Macroeconomic Time Series, Micro to Macro, National Income Accounting, National Wealth, Econometric Modeling.

¹ When measures by GDP alone

1 The Problem

Questioning the measurement of economies by GDP alone is not new. Economists, from Nobel Prize winning Joseph E. Stiglitz to less well-known scientists, were internationally looking for a way to get away from the “GDP fetishism”², or to deal with the weaknesses³ of the GDP⁴. These efforts went so far, that many considered replacing it with alternatives⁵ like the Gross National Happiness⁶. Graham for instance quit the attempt to define the GNH Index with an open-ended book⁷, while Stiglitz for instance attempted to create a broader version of the GDP⁸ for a more comprehensive approach⁹.

How can economies be measured more realistically while keeping the complexity of the index practical?¹⁰ To solve this task, which contains a target conflict in itself, only highly aggregated values have been considered. As a result, the choice for this Index is the GINI coefficient and the factor of Inflation.

How do nation rankings¹¹ change, when you include these two simple and widely acknowledged factors in the GDP, and use this new index as a basis for some further indexes?

² The Guardian (2009): Sarkozy attacks focus on economic growth, under <http://www.theguardian.com/business/2009/sep/14/sarkozy-attacks-gdp-focus>

³ Stiglitz proposes five fixes for the “deficiencies of the GDP (as an indicator for living standards)”, Stiglitz J.E./ Sen A./ Fitoussi J.-P. (2009): Report by the Commission on the Measurement of Economic Performance and Social Progress, p.22

⁴ Stiglitz J.E./ Sen A./ Fitoussi J.-P. (2009): Report by the Commission on the Measurement of Economic Performance and Social Progress, p.22

⁵ Beyond-GDP (2013): Indicators, Enlarged GDP, Social Indicators, under http://www.beyond-gdp.eu/indicatorList.html?indicator=Enlarged_GDP. Countless further statistical indicators try in principle the same. For instance the Human Development Index HDI (with a strong emphasis on social factors), as well as indexes from the World Economic Forum.

⁶ Especially in the recent economical crisis

⁷ Mainly due to problems of measuring the multi-dimensionality of well-being,

Graham C. (2011): The Pursuit of Happiness. An economy of Well-being, p.125-126. Also described in Stiglitz proposes five fixes for the “deficiencies of the GDP (as an indicator for living standards)”, Stiglitz J.E./ Sen A./ Fitoussi J.-P. (2009): Report by the Commission on the Measurement of Economic Performance and Social Progress, p.14-15 and Fleurbaey M. (2008): Individual well-being and social welfare: Notes on the theory, p.23-24

⁸ With fixing the GDP issues + Quality of Life measurement + Environment and Sustainability

⁹ Stiglitz J.E./ Sen A./ Fitoussi J.-P. (2009): Report by the Commission on the Measurement of Economic Performance and Social Progress, p.21-85

¹⁰ Which index has the right balance between measuring economical strength while being more comprehensive and statistically adequate than the GDP alone?

¹¹ The scientific gain is a simple but comprehensive way to picture and rank the economies more clearly and more realistically. This works also ex-post recalculating the recent years, or decades, and therefore showing the rise and fall of economies resetting some rankings without too many statistical problems.

2 The Index and its Versions

2.1 Why is the GDP not enough?

The GDP mainly measures market production – expressed in monetary units¹². It says nothing about the household income, and nothing about the distribution of that income nationwide¹³. It does not include unemployment or the price burden¹⁴ on the consumers, which can smalen disposable income significantly¹⁵.

Still the GDP is treated as if it were a measure of general economic well-being¹⁶. This leads to a perceived reality-gap between GDP Data and the experienced well-being of the people. This happens especially when focusing on growth (of the GDP). Figure 1 defines growth as *additional economic activity*¹⁷. It shows the reduced economical activities and its possible reasons as cutouts.

To get away from this “growth fetishism”¹⁸ Stiglitz argues that disposable income¹⁹ of nations and households is more suited to measure economic well-being. *“Material living standards are more closely associated with measures of net national income, real household income and consumption – production can expand while income decreases or vice versa when account is taken of depreciation, income flows into and out of a country, and differences between the prices of output and the prices of consumer products....citizens’ material living standards are better followed through measures of household income and consumption”*²⁰. This predestines income indexes for expansion of the GDP. This turns the GINI coefficient into a valid choice.

¹² Stiglitz J.E./ Sen A./ Fitoussi J.-P. (2009): Report by the Commission on the Measurement of Economic Performance and Social Progress,p.12-13

¹³ “If inequality increases enough relative to the increase in average per capital GDP, most people can be worse off even though average income is increasing”, Stiglitz J.E./ Sen A./ Fitoussi J.-P. (2009): Report by the Commission on the Measurement of Economic Performance and Social Progress,p.8

¹⁴ Inflation

¹⁵ Stiglitz J.E./ Sen A./ Fitoussi J.-P. (2009): Report by the Commission on the Measurement of Economic Performance and Social Progress,p.12-13

¹⁶ Stiglitz J.E./ Sen A./ Fitoussi J.-P. (2009): Report by the Commission on the Measurement of Economic Performance and Social Progress,p.21

¹⁷ Similar to Stiglitz’s definition of economical activity. Stiglitz J.E./ Sen A./ Fitoussi J.-P. (2009): Report by the Commission on the Measurement of Economic Performance and Social Progress,p.11

¹⁸ The Guardian (2009): Sarkozy attacks focus on economic growth, under <http://www.theguardian.com/business/2009/sep/14/sarkozy-attacks-gdp-focus>

¹⁹ Available for expenses

²⁰ Stiglitz J.E./ Sen A./ Fitoussi J.-P. (2009): Report by the Commission on the Measurement of Economic Performance and Social Progress,p.13

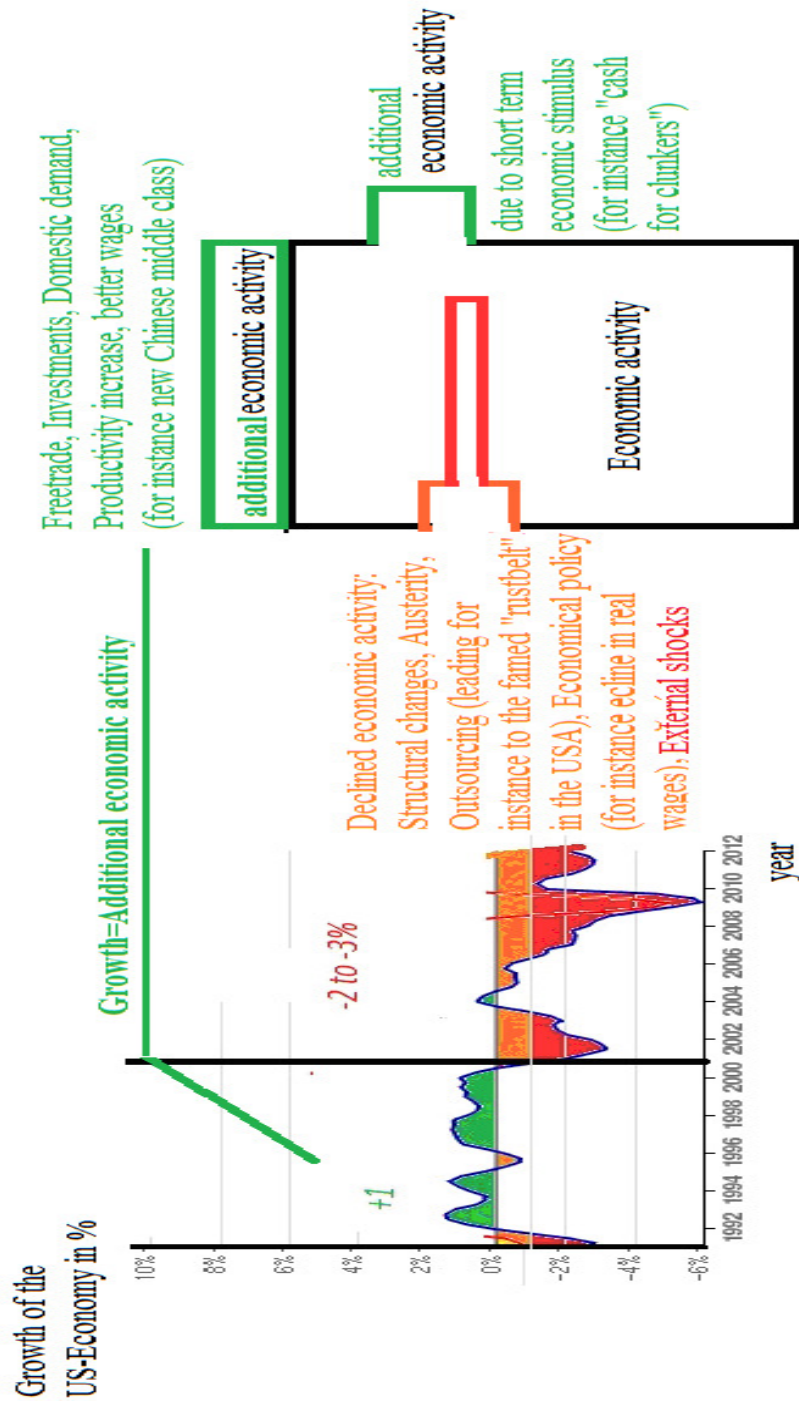


Figure 1 Growth visualized with its influencing factors²¹

²¹ Own creation with a table from Shadowstats.com (2012): under http://www.shadowstats.com/alternate_data/gross-domestic-product-charts

2.2 GDP - GDP x GINI

$$(1 - \text{GINI}) \times \text{GDP} = \text{K_Index}$$

GINI²² measuring the long term cause for social transfers, which freeze a part of the GDP already.

The GINI-coefficient is a highly aggregated statistical measure for income inequality. The incomes of a Nation are put in relation with an absolutely even distribution of all incomes²³. Figure 2 shows this graphically with the squared surface between the Lorenz curve and the 45° even.

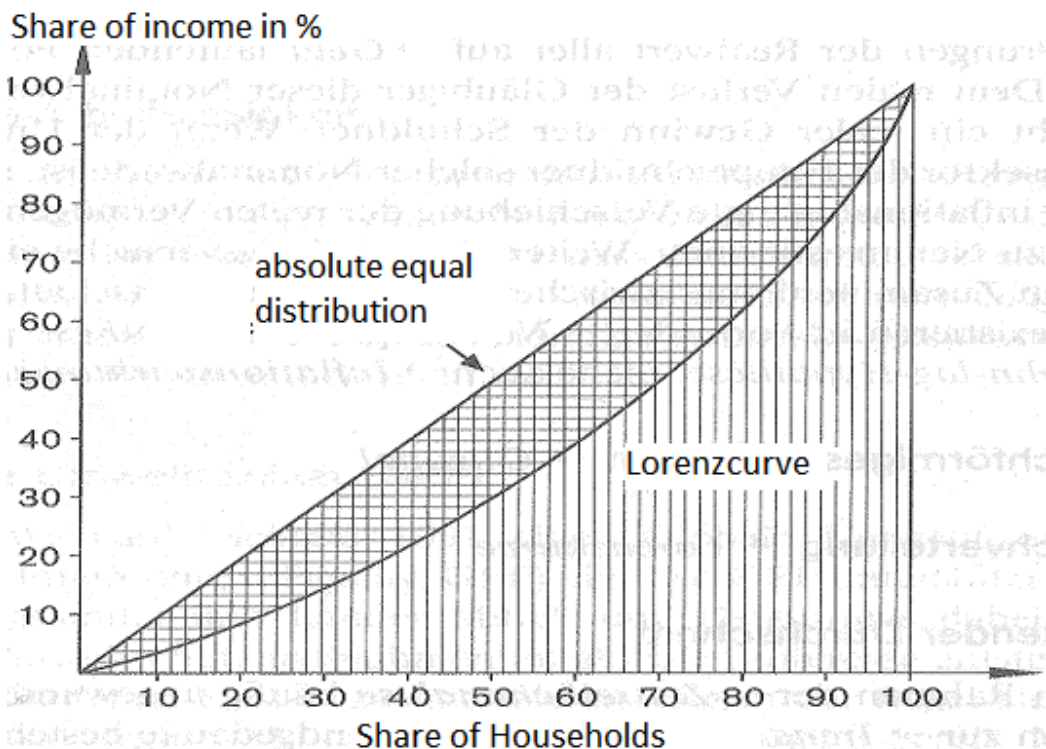


Figure 2 The GINI²⁴

As described in the chapter before it makes sense to expand the GDP with an income measure. But why doing so with an inequality measure that shows²⁵ the income distri-

²² Why would you want to mix this coefficient into the “holye” GDP?

²³ Hohlstein, Michael (2003): Lexikon der Volkswirtschaft, p.317

²⁴ Hohlstein, Michael (2003): Lexikon der Volkswirtschaft, p.317

bution of a nation? *“Over the past two decades, the dominant pattern in OECD countries is one of a fairly widespread increase in income inequality, with strong rises in Finland, Norway, Sweden (from a low base) and Germany, Italy, New Zealand, and the United States (from a high base)”*²⁶.

*Hypothesis*²⁷: *Higher inequality = higher pressure to increase public social spending*
Social expenses have to occur²⁸ due to problems²⁹ caused by inequality. *The GINI coefficient measures indirectly **the long term pressures** on the economy, which require social transfer payments*³⁰. Since economical policy³¹ is often *short term* and not truly comparable in detail³², the GINI coefficient is. Most countries spend about 20% - 30% of their income for public social spending³³. *These social expenses*³⁴ *are more or less*³⁵ *fixed costs in any GDP. **The true GDP is therefore “de facto” relativized already downwards by this fixed-spending-factuality on the ground.*** Figure 3 shows public social spending in percent of the GDP by OECD nations³⁶. The public pension expenditures have to be added to these numbers.

²⁵ highly aggregated

²⁶ Stiglitz J.E./ Sen A./ Fitoussi J.-P. (2009): Report by the Commission on the Measurement of Economic Performance and Social Progress, p.33

²⁷ Controversial to a certain degree

²⁸ At least partially

²⁹ Multiplier effects. For instance well paying jobs with positive multiplier effects, while unemployment creates negative multiplier effects (i.e. not just opportunity costs like lost taxes but external effects as well like dealing with crime)

³⁰ These may be structurally underfunded or overfunded compared to the needs of the society based on the inequality pressures, making the society (and economy) structurally more or less prone to misery (visible or covert).

³¹ If for instance (when designing a new indicator) simply choosing the percentage of GDP paid for social matters, those countries which pay less to social transfers would keep a higher GDP. You would need an inverse ranking logic when you want to measure economic strength. This and the **short term timeframes for economical policy** makes a social expenses based index problematic.

³² Democracies may have more difficulties in cutting social expenses than less democratic systems. Philosophical or historical aspects (like Calvinism in Anglo-American societies) decide as well how high these expenses should be. The living standards these payments create may be also not easily comparable- besides all the problems with statistical adequation (i.e. what you measured -and how vs. what you wanted to measure).

³³ OECD (2013): Social Expenditure Database (SOCX), under <http://www.oecd.org/els/soc/socialspendingdatabasesocx.htm>

³⁴ Including public pensions

³⁵ Depends on the grade of democratization and tradition of protest (for instance very common in France, but not very well liked in Germany)

³⁶ OECD (2013): Social Expenditure Database (SOCX), under <http://www.oecd.org/els/soc/socialspendingdatabasesocx.htm>

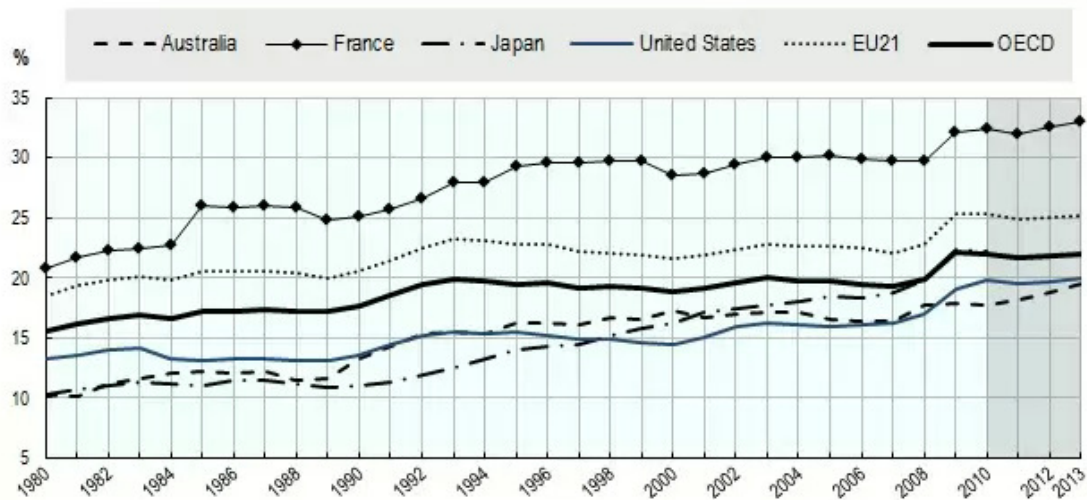


Figure 3 Public social spending based on detailed data for 1960-2009; national aggregates for 2010-2012 and estimates for 2013, in percentage of GDP³⁷

*“Income flows are an important gauge for the standard of living, but in the end it is consumption and consumption possibilities over time that matter. The time dimension brings in wealth”³⁸. The very same time dimension brings long term necessities to fund inequality based problems, is therefore a *negative income flow/ decreased consumption possibility* (i.e. costs wealth long term).*

*If necessary social transfer payments freeze up **permanently** a part of the GDP, why not make this **visible in the GDP permanently**?*

The K_Index ranks with the introduction of the GINI coefficient the less developed nation *a lot* lower, and the developed nation moderately lower, depends on how well the income is distributed. Structurally underfunding the necessary public social payments will not help the States in these rankings.

This index is vaguely related to the national accounts measure “Net national disposable income (as percentage of gross domestic product)” that Stiglitz proposes³⁹, but is more practical due to the highly aggregated but internationally accepted factors.

³⁷ OECD (2013): Social Expenditure Database (SOCX), under <http://www.oecd.org/els/soc/social-expenditure-databasesocx.htm>

³⁸ Stiglitz J.E./ Sen A./ Fitoussi J.-P. (2009): Report by the Commission on the Measurement of Economic Performance and Social Progress, p.29

³⁹ Stiglitz J.E./ Sen A./ Fitoussi J.-P. (2009): Report by the Commission on the Measurement of Economic Performance and Social Progress, p.24, 30

Less developed economies tend to have a higher inequality index.

Economists tend to view those Economies as healthier, which have a population and workforce, which can afford goods and services⁴⁰. This is also known as domestic demand driven economy⁴¹. Import- and export-balance is a further relevant factor for long-term stability, since deficit equals debt or additional taxation.

Economies that are exporting mostly raw materials have a high GDP very often, while their people are poor, cannot afford goods or services, and an often corrupt elite finds ways to cut its share off the income from the exports. The country gets looted, very few get very rich, but the people generally are chanceless and miserable.

When it comes to GDP, both nations are equal.

Ideal typical example: What oil price does an energy exporting country⁴² need, to finance its social programs? *Moreover, why not ask this question from the metaphoric "tail of the horse" over the inequality Index (under the precondition⁴³ that income inequality decides more or less directly and long term⁴⁴ about the amount of necessary transfers)?*

"For a poor developing country to be told that its GDP has gone up may be of little relevance. It wants to know whether its citizens are better-off, and national income measures are more relevant to this question than GDP"⁴⁵.

2.3 GDP – [(GDP x GINI) + (GDP x Inflation)]

$(1 - \text{GINI} - \text{Inflation nominal}) \times \text{GDP} = \text{K_Index_Infl.}$

This is the main K_Index. Social factors relativized GDP using the interdependence between GINI and Inflation to show good governance.

The relativization of less healthy or underdeveloped economies⁴⁶ over income distribution can, as explained above, show a more realistic ranking of nations. But there are fur-

⁴⁰ The choice of Stiglitz to choose disposable income is an approach that builds on this fact.

⁴¹ For instance USA, OECD (2013): 1. Gross domestic product, under http://stats.oecd.org/Index.aspx?DatasetCode=SNA_TABLE1

⁴² For instance Russia

⁴³ Hypothesis

⁴⁴ More long term than most economic policy timescale changes at least (usually based on election cycles)

⁴⁵ Stiglitz J.E./ Sen A./ Fitoussi J.-P. (2009): Report by the Commission on the Measurement of Economic Performance and Social Progress, p.24

⁴⁶ If the complete economy relies on exporting oil or ore, the whole nation becomes *very* dependant on price and vulnerable to external shocks. Reagan pressured the Soviet Union with lowering the oil price, and

ther pressures on the economy that could also help rate economies clearer. One of these pressures is inflation.

“The Consumer Price Index (CPI) is a measure o the average change over time in the prices paid by urban consumers for a market basket of consumer goods and services. The CPI affects nearly all Americans because of the many ways it is used. Following are major uses: As an economic indicator, as a deflator of other economic series and as a means of adjusting dollar values”⁴⁷.

Ideal typical examples (based on homo oeconomicus): It is viewed by the “tiny homo Oeconomicus” (the individual) as “everything got so expensive” or as “why is so much month left over at the end of the paycheck, it was enough earlier...” or “...what? Grandpa? Cinema for 50 cents in 1950?”. For the “large homo Oeconomicus” (the Investors, Companies) it means the investment made does not pay off anymore, the profit is eaten up by inflation, or the savings need an investment method *at least* above this inflation level. For the “supersized homo Oeconomicus” (the States) it means on one hand cheaper exports, and on the other hand more expensive imports. So it depends if you have a balanced trade budget⁴⁸, or if you are an export driven nation⁴⁹, or if you are an importer (for instance of energy), the effects mean something good or bad to you⁵⁰.

Generally, inflation is viewed as *not* good by most economical actors and economists, certainly *not in the long run*.

Including the factor of inflation in the relativization of the GDP is meant to downgrade nations that undermine the spending power/buying power of its people or gambles with its fiscal stability, while ranking those that act responsibly above the irresponsible. In any case it *is too important (on too many levels) to be simply ignored if the GDP should be more realistic. The more broken the economy, the more relevant this factor becomes*, since Inflation that is out of control is typically not a simple external shock, but is often

while the oil price was high in the 70s, the Soviets invaded Afghanistan, while once the oil price was down in the 80s, they had to retreat. The complete raw materials exports of the whole empire basically barely topped the years earning of just one of many American multi nationals (like GE) at the time.

⁴⁷ Bureau of Labor Statistics (2013): Consumer Price Index, under http://stats.bls.gov/cpi/cpifaq.htm#Question_1

⁴⁸ Italy for instance

⁴⁹ Japans famed Abenomics devalued the Japanese currency Yen to make the exports cheaper and to leave a decade long stagnation over export surpluses.

⁵⁰ The mechanism of artificially downgrading the currency to make the nation and its products cheaper is important for “staying in the game” of export, attract investments etc. There are furthermore anticipation games, when all expect things to get cheaper tomorrow you don’t spend today, but when you know its more expensive tomorrow and the savings are less valuable then you’re likely to invest today.

caused by longstanding structural problems⁵¹. Those hit hardest are not so much investors that can relocate, but the weaker social layers like elderly, which cannot⁵². These persons get a share of the GDP over income re-distribution from public social payments.

High inflation relativizes the social transfer payments⁵³ (the receiving persons get) downwards, but amplifies countless negative external effects that are caused by misery in an economy (and society), while causing the necessity for even more substantive transfer payments.

Second hypothesis: The GINI coefficient and Inflation are interdependent if the relativization of the GDP towards realism is the goal.

The relativization in the K_Index is less grave than the relativization over the GINI. It can only serve as a pinnacle in tight rankings in cases when the countries are well governed⁵⁴.

2.4 GDP_per_capita, and GNP variants

$(1 - \text{GINI}) \times \text{GDP_per_capita}$

$(1 - \text{GINI} - \text{Inflation nominal}) \times \text{GDP_per_capita}$

$(1 - \text{GINI} - \text{Inflation nominal} - \text{Unemployment rate nominal}) \times \text{GDP} = \text{K_Index_Infl_Un.}$

$(1 - \text{GINI}) \times \text{GNP}$

$(1 - \text{GINI}) \times \text{GNP_per_capita}$

Transformation of an economical power index into an inequality measurement index.

The advantage of this formula construction is it works as a variety of Indexes. GDP_per_capita, and as a retired Professor⁵⁵ suggested, Gross National Product GNP⁵⁶ (or GNP_per_capita). The advantage of the GNP is the removal of inflation with using real numbers. However, this modification transforms the K_Index to an *income distribution index*, away from a *reality adjusted national economic power index*. Variants with

⁵¹ It can prevent a recovery as well

⁵² Example Euro crisis: Wealthy Greeks bought the UK and German housing market empty (causing a real estate bubble “by the book”), while in Greece old people died on lack of affordability of medical care.

⁵³ Typically a third of GDP

⁵⁴ Now we have a beautiful way to measure the nations with a more realistic view of the economy. (I admit it, I just single handedly destroyed the beauty of GDP –GDP x GINI with the technical and quirky additional inflation relativization). However there are variants doable

⁵⁵ Prof. Dr. Enke (retired) from University of applied Sciences Nuertingen and University Marburg, who I would love to thank for the support and encouraging me to pursue this Index further

⁵⁶ In German it's the BNE = Bruttonationaleinkommen

the unemployment rate further downgrades nations that do not show responsible good governance⁵⁷.

2.5 Productivity Index (K_Index_Infl. / Labor Force)

$$K_Index / Labor\ Force = K_PROD$$

$$K_Index_Infl. / Labor\ Force = K_PROD_Infl.$$

Theoretical value (how much) a worker creates when the GDP takes income inequality in account.

Each economy is in a different state of development. The less developed an economy is, the less value the working force creates per work hour or per worker. A lower developed economy that has half of its labor force in agriculture, can barely earn a sufficient GDP, that is equal to that of a developed economy, where for instance the same workers create turbines instead of tomatoes in the same working timeframe.

When the K_Index is applied as the basis of this input-output question, the distortions caused by “workforce assumption” are reduced. A nation that exports energy, has rarely substantial numbers of workers in that industry, but gets over the high GDP a good productivity Index. *This does not reflect realistically the situation of workforce productivity.*

Ideal typical example: Poor people watching a pipeline pumping billions of petro-dollars aside their village out of their country, until they become terrorists or sabotage it out of economical motives (to get some fuel), *is not valid productivity* (in economical sense).

Since these less developed economies tend to have a higher GINI coefficient than a balanced developed high-wage economy, picking the K_Index (with its GINI) can benefit a more realistic assessment.

2.6 Debt ratios K_Debt or K_Debt_Infl.

$$\text{National Debt} / K_Index = K_Debt$$

$$\text{National Debt} / K_Index_Infl. = K_Debt_Infl.$$

Ability (of a nation) to pay its debts without cutting structurally into the social transfers.

⁵⁷ This downgrading might go too far, besides impractical complexity since there are different levels of unemployment. (For instance frictional unemployment or the statistical values themselves, like broadness definitions U1 U2 etc that might not be comparable internationally).

Debt-to-GDP ratios are very common in economics. Using these K_Index and K_Index_Infl. values as basis for a debt-ratio makes only sense, when there is an interest in a *broader scope about the economy*. If only the *strict financial ability* of a nation to pay its debts counts, this index is less relevant. Early warning systems that analyze the development path of nations might get sooner warning signs with the K_Debt_Infl. than with classical debt-to-GDP ratios. *This is especially the case when a nation has to cut deeper into the public social payments*⁵⁸. All values lead to technically higher debt percentages than with the classical debt-to-GDP ratios, since the K_Index and K_Index_Infl. generally lowers the GDP⁵⁹.

2.7 Digression: Four- or Five-Sector-Model

Identifying government overheads or social sector overheads (in the economic structure)- with or without shadow economy.

Analyzing the *sectoral structure* of economies shows the level of development of economies, and to a certain extent good or bad governance. The “three sector hypothesis” segments the economy into three sectors. Primary, Secondary and Tertiary Sector. Economies tend to grow towards the tertiary sector, the higher developed the economy is. Table 1 shows the definitions of these three sectors and gives a brief example about the size of each sector for a developed or undeveloped economy.

Restructuring the third sector and adding the fourth sector of Government and Non-profit helps to identify government overheads⁶⁰. If taking demographic changes of the population in account, analyzing the economies with a separated nonprofit sector can be a useful modification of the three-sector-model⁶¹. Including the fifth sector of shadow economy is problematic due to lack of data (quantity of data). Many problems occur also in the quality of the data due to significant statistical adequation problems when measuring these additional sectors⁶².

Table 2 shows the proposed sectoral structure with a brief description of each sector.

⁵⁸ These measures are perceived as a positive measure in the financial sector, which means the markets value financial stability higher than the living standards of those at the receiving end of public social transfers.

⁵⁹ Disposable income is always lower than the original income value

⁶⁰ These oversizes are typical for “inflexible/ incrusted” economies or bad governance economies. For instance was this characteristic for Argentina before its crisis in the 90s or Greece in the current Euro crisis.

⁶¹ Analyzing the Greek economy or the German economy over this model could be interesting.

⁶² Stiglitz J.E./ Sen A./ Fitoussi J.-P. (2009): Report by the Commission on the Measurement of Economic Performance and Social Progress,p.26

Table 1 Three sector hypothesis

| | |
|------------|--|
| Sector I | Extraction of raw materials + fishing (developed Nation 1-5%/ undeveloped 50% or more) |
| Sector II | Industry, manufacturing, construction (developed Nation 20 to 30%/ undeveloped 20%) |
| Sector III | Services (developed Nation 50% or more/ undeveloped 10%) |

Table 2 Modified three sector hypothesis with two additional sectors and readjusted third sector

| | |
|-------------------|---|
| Sector I | Extraction of raw materials + fishing |
| Sector II | Industry, manufacturing, construction |
| Sector III | Services + I.T. (with communications industry) |
| Sector IV | State sector ⁶³ and Nonprofit (Govt. Jobs, churches, red cross etc.) |
| Sector V (option) | Shadow economy (problem to get correct numbers, usually 15-20%) |

3 Examples

3.1 Example K_Index and K_Index_Infl.

Two ideal typical countries that seem equal. Country **A** (less developed) and Country **B** (developed) have a GDP of 2.5 Trillion Euro each.

Country A (Less developed):

| | |
|----------------|------------------------|
| Gini | 0.40 |
| Inflation | 7% = 0.07 nominal |
| Relativization | 0.47 |
| GDP | 2,500,000,000,000 Euro |
| Labor Force | 42,000,000 |

$$K_Index \text{ (without Inflation): } (1 - 0.4) \times 2,500,000,000,000 = 1,500,000,000,000$$

$$K_Index_Infl. : (1 - 0.4 - 0.07) \times 2,500,000,000,000 = \mathbf{1,325,000,000,000}$$

⁶³ “Government output represents around 20% of GDP in many OECD countries and total government expenditure more than 40% for the OECD countries”, Stiglitz J.E./ Sen A./ Fitoussi J.-P. (2009): Report by the Commission on the Measurement of Economic Performance and Social Progress, p.12

Country B: (Higher developed)

| | |
|----------------|------------------------|
| Gini | 0.28 |
| Inflation | 2% = 0.02 nominal |
| Relativization | 0.3 |
| BIP | 2,500,000,000,000 Euro |
| Labor Force | 42,000,000 |

$$K_Index \text{ (without Inflation): } (1 - 0.28) \times 2,500,000,000,000 = 1,800,000,000,000$$

$$K_Index_Infl. : (1 - 0.28 - 0.02) \times 2,500,000,000,000 = \mathbf{1,725,000,000,000}$$

Comparison of the results:

Even if both nations have a similar GDP, the picture looks very different when only two further factors are included (Gini and Inflation). The difference between K_Index and $K_Index_Infl.$ is small, but will be important in tight rankings.

$$\text{Country A (less developed) relativized GDP} : \mathbf{1,325,000,000,000}$$

$$\text{Country B (higher developed) relativized GDP} : \mathbf{1,725,000,000,000}$$

3.2 Example Productivity K_PROD or $K_PROD_Infl.$

$$K_Index / \text{Labor Force} = K_PROD$$

$$K_Index_Infl. / \text{Labor Force} = K_PROD_Infl.$$

Productivity county A (with inflation)

$$K_PROD_Infl. = 1,325,000,000,000 \text{ Euro} / 42,000,000 = \mathbf{31,547} \text{ Euro per capita}$$

Productivity country B (with inflation)

$$K_PROD_Infl. = 1,725,000,000,000 \text{ Euro} / 42,000,000 = \mathbf{41,071} \text{ Euro per capita}$$

Productivity country USA level (with inflation)

$$(1 - 0.49 - 0.032) \times 11.363 \text{ Trillion Euro} = K_Index_Infl. = 5.431 \text{ Trillion Euro}$$

$$5.431 \text{ Trillion Euro} / 142\text{m Labor Force} = K_PROD_Infl. = \mathbf{38,250} \text{ Euro per capita}$$

Productivity country China level (with inflation)

$$(1 - 0.47 - 0.054) \times 6.23 \text{ Trillion Euro} = K_Index_Infl. = 2.965 \text{ Trillion Euro}$$

$$2.965 \text{ Trillion Euro} / 802\text{m Labor Force} = K_PROD_Infl. = \mathbf{3,697} \text{ Euro per capita}$$

The new numbers of productivity are generally lower.

4 Criticism

Does it matter how realistically you relativize the GDP downwards, and how adequate the new picture is, when all that matters is the de-facto nominal GDP (and therefore spending power) that's been generated?

Does it matter when you downgrade a raw materials exporting economy, when all that counts is the nominal cash the economy generates, i.e. *the ability to pay off its debts*? A debt-to-K_Index_Infl. ratio will always be worse (higher) than the classical debt-to-GDP ratio. How relevant can the Index therefore be, when used to measure *debt* ratios? A sinking K_Index_Infl. (maybe due to worsening GINI or Inflation) just warns the economists sooner about internal problems in the economy/ society (that might or might not be addressed/quelled). *The less a democracy can cut further into social transfers the more sense this index makes.*

As for the GINI coefficient, a lower GINI coefficient means only a more equal income distribution, but it says nothing about the *level* of income. When all are equally poor, the GINI is low. This however would only be likely in a low GDP nation, a high GDP with a good income distribution is a very good sign in contrary.

As for the productivity Index K_PROD or K_PROD_Infl., a lowered GINI coefficient (inequality gets better) is *technically not a productivity increase*, the same with a lowered Inflation rate. On the other hand, the classical productivity index is also "just a theoretical value", which includes distortions from the upper 10% of income.

A professor⁶⁴ mentioned that not all nations might see inequality as a bad thing. I agree that for instance Calvinistic societies⁶⁵ might tolerate inequality more than European economies, but the general acceptance of the GINI coefficient makes this worry irrelevant⁶⁶. The formula uses the GINI coefficient, and a high GINI coefficient value is not accepted as a *positive* factor in an economy generally. A very abstract professor⁶⁷ argued that the pick of the factors could be seen as arbitrary, even if mixing indicators is not uncommon in economical sciences. The indicator sets a very clear goal, namely increased realism or reality based adjustment of the GDP with an indicator that is used al-

⁶⁴ Prof. Dr. Hayo from University Marburg

⁶⁵ USA/ UK and Anglo-American influenced

⁶⁶ In my opinion

⁶⁷ Prof. Dr. Koerber-Weik (retired) from University of applied Sciences Nuertingen

ready. Chapter 2.2 and 2.3 describes related to arguments from Stiglitz⁶⁸ why the pick is not arbitrary⁶⁹.

Is a relativization of 1 Trillion Euro in a 2.5 Trillion Euro economy, which has a high GINI coefficient value, or a relativization of 700 Billion Euro in a similar sized economy with a low GINI coefficient value overkill-downgrading? This means a relativization of 28-40% depends on whether the GINI coefficient is 0.28 or 0.40. Chapter 2.2 and 2.3 explain the rationale behind the pick⁷⁰, but it might be controversial if the *height* of these transfer payments justifies the height of the GDP relativizations.

5 Conclusion

Social factors relativized GDP is the basis for a variety of *more realistic economical indicators*⁷¹, including productivity and debt-ratios. *Cutting out that part of the GDP, which is financially long term reserved for social transfers*⁷², is the basis of this extended GDP/GDP relativization. For this purpose, the GINI coefficient is most suitable, since it tries to measure⁷³ the basis of the transfer payments, the income inequality.

The GINI coefficient and the factor inflation are interdependent if realism adjustment of GDP is the goal.

Countries with a high income inequality and a high inflation rate are downgraded strongly, while countries with a low GINI coefficient and a low inflation rate are relativized downward only by a small margin. The now more realistic picture to differentiate nations with a similar GDP can help to identify problems and instabilities sooner.

The K_Index or K_Index_infl. “repairs” some of the weaknesses of the classical GDP, while relying on established and commonly acknowledged factors and methods of measurement. The K_Index or K_Index_Infl. cannot be questioned by its coherent logical construction⁷⁴, only by its relevance when used in debt-ratios (where only the *nominal* financial credit generated counts).

⁶⁸ Stiglitz J.E./ Sen A./ Fitoussi J.-P. (2009): Report by the Commission on the Measurement of Economic Performance and Social Progress, p.29

⁶⁹ As it might seem

⁷⁰ Public social spending + pensions freeze up factually a part of the GDP already

⁷¹ Scientific gain

⁷² “financially long term frozen up part of the GDP”

⁷³ Statistical adequacy in mind

⁷⁴ Its mathematical beauty in simplicity neither

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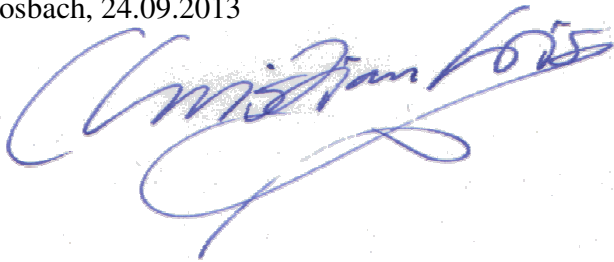
7 Ehrenwörtliche Erklärung (German declaration)

Ich erkläre hiermit ehrenwörtlich:

- dass ich dieses working paper selbstständig und ohne fremde Hilfe angefertigt habe
- dass ich die Übernahme wörtlicher Zitate aus der Literatur sowie die Verwendung der Gedanken anderer Autoren an den entsprechenden Stellen innerhalb der Arbeit gekennzeichnet habe.

Ich bin mir im Weiteren darüber im Klaren, daß die Unrichtigkeit dieser Erklärung zur Folge haben kann, dass ich von der Ableistung weiterer Prüfungsleistungen ausgeschlossen werden und dadurch die eventuelle Zulassung zu einem weiteren Studiengang verlieren kann.

Mosbach, 24.09.2013

A handwritten signature in blue ink, appearing to read 'Christian Kiss', written in a cursive style.