International Journal of Economics, Commerce and Management
United Kingdom Vol. II, Issue 11, Nov 2014
http://ijecm.co.uk/ ISSN 2348 0386

MEASURING THE ECONOMIC MASS
THE ALBANIAN CASE

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Abstract

This paper is interested to introduce a new economic indicator that is called “the economic mass. The economic mass tries to explain the economic behavior of any economy from a multidimensional perspective. In this paper, will show how to calculate the "economic mass", a new indicator which is used in the modeling of international trade such as gravity models where the mass is of great importance in these models. Economic mass in this paper explains Albania's economic behavior observed in a visual dimension and understandable to the ordinary reader. The main objective of this paper is to build an indicator that the following will be called economic mass, which will display the economic mass of Albanian economy in years using the volume of spheres. The data are taken from the statistics office INSTAT Albania, the methodology used is the volume of the spheres in which we use a mathematical formula to show the mass of a country in years. This indicator we hope to visualize in a simple way the behavior of the economy from a point of view that we are not learned before. By processing the data we see that we have a contraction of the economy in recent years.

Keywords: Economic mass, International trade, Gravity models, GDP, Econographicology, Economic Teaching

INTRODUCTION

The gravity model of trade is analogous to Newton's law of gravity in mechanics: the force of gravity between two bodies is proportional to each physical weight of the bodies divided from the square of the distance between the centers of gravity in the meter.

$$F = G\frac{M_1 M_2}{D^2}$$

The analogy to trade is as follows: trade flows between two countries are proportional to the product of any "economic mass" of countries, usually measured by GDP, each powers of size is determined, divided by the distance between the respective countries' economic centers gravity, usually their capitals. From now on we will refer to the base of the gravity model, the exponents for size and distance are not set.

$$M = kY_M^{\beta} Y_X^{\gamma} D^{\delta}$$

Where M is the flow of imports into the country M to country X, Y_M and Y_X are the GDP of countries M and X and D is the geographical distance between the capitals of countries.

Linear form of the model is as follows:

$$\log(M) = \alpha + \beta \log(Y_M) + \gamma \log(Y_X) + \delta \log(D)$$

This basic model, when evaluated, gives relatively good results. However, we know that other factors affect trade levels.

Questions on how to measure economic mass and economic distance concepts rise analogous to Newton's law, and the model of gravity.

It is questionable who best represents the concept of "economic measures". Gross Domestic Product seems a good assumption, but can a nominal gauge finish to exchange rates, or constant prices, or perhaps to Purchasing Power Parity?

In pursuance of this paper will show a way to measure a country's economic mass to become comparable and easier to understand. The following calculations and the way the economic mass it's calculated it's meaningful to compare the size of a country in years.

THE CALCULATION OF ECONOMIC MASS

Building economic mass is derived from studies of the economic size of a country by the use of spheres. Suggest the use of spheres because it is easy to visualize their behavior by different measures and colors in a geographical space.

First, assume that economic mass is fixed by the volume of a sphere. Thus, the economic mass it is possible to observe graphically different dimensions of the behavior of economies of any country represented by the construction of a single sphere. The sphere will

prove different masses in time and space. In fact, economic mass is based on the application of the classic formula of a sphere followed by the formula (a) Thus the volume of a sphere is equal to multiplying by 4/3 (π) and radius in third power.

(a) $V = 4/3\pi r^3$

Building economic mass, π is a constants equal to 3.1416 and radius are regulated by GDP growth rates between the two periods of time, in our case the output of GDP last year GDPt-1in real terms and output of GDP for current period GDP t in real terms. But what represents the growth rate of GDP? The growth rate is increased productivity, production capacities and all other components of an economy in percentage between years. Economic growth is due to increased labor, capital, technology or productivity that leads to nominal GDP growth, and the conditions when the inflation rate is constant, in real GDP growth.

The growth rate presented by formula (b) where the GDP in real terms are for him stripped of the inflation rate.

(b) G = GDP t - GDPt-1/GDPt-1.

(c) $V = 4/3\pi G^3$

Finally, economic mass is based on the size of different spheres along different periods in time and space.

The main variable that sets the volume of the sphere mass is the growth rate of GDP. We can see that different masses of spheres helps us see if there is expansion, contraction or stagnation in the growth rate of GDP over different periods of time and space. However, it is suggested to use different colors in different spheres. This helps to visualize easily the behavior of economic mass within a geographical space.

The change of Histogram of GDP in two dimensions and economic mass is that that we are able to observe or mass of any economy from a different geographic approximation.

Another advantage of using economic mass is the process of accumulation of long historical data of GDP, under the visualization of a long structure formed by the merger of a large number of spheres together in a geographic area.

The large structure will be called "structure of economic accumulation". Thus we can observe the expansion, contraction and stagnation of each economic mass in wide range of spheres over different periods of time and space. This can give us a multidimensional effect to observe the behavior of GDP.

EXAMPLE OF ECONOMIC MASS

Let us take an example of Albanian economic mass in the years 2000 to 2012.

The data are taken from World Bank portal for the years 2000-2012. Taking economic growth for the respective years and by applying the formula "c" described above we build Table No. 1, where the first column are given the years that are focused on, in the second column appears economic growth which is calculated by taking into consideration real GDP of two consecutive periods. The third and fourth column are constant imperative to calculate economic mass while the fifth column calculates economic growth set in the third power. By applying the formula on the volume of spheres outlined above we take in conclusion the comparative mass of each year. With the data of Table No. 1 we build graph No. 1 which shows the geographical distribution of mass in years. Can observe a set of spheres that are interconnected and arranged in a logical sequence of the evolution of growth rate of GDP. Can observe various masses of spheres and the structure of economic accumulation in the same graphical area.

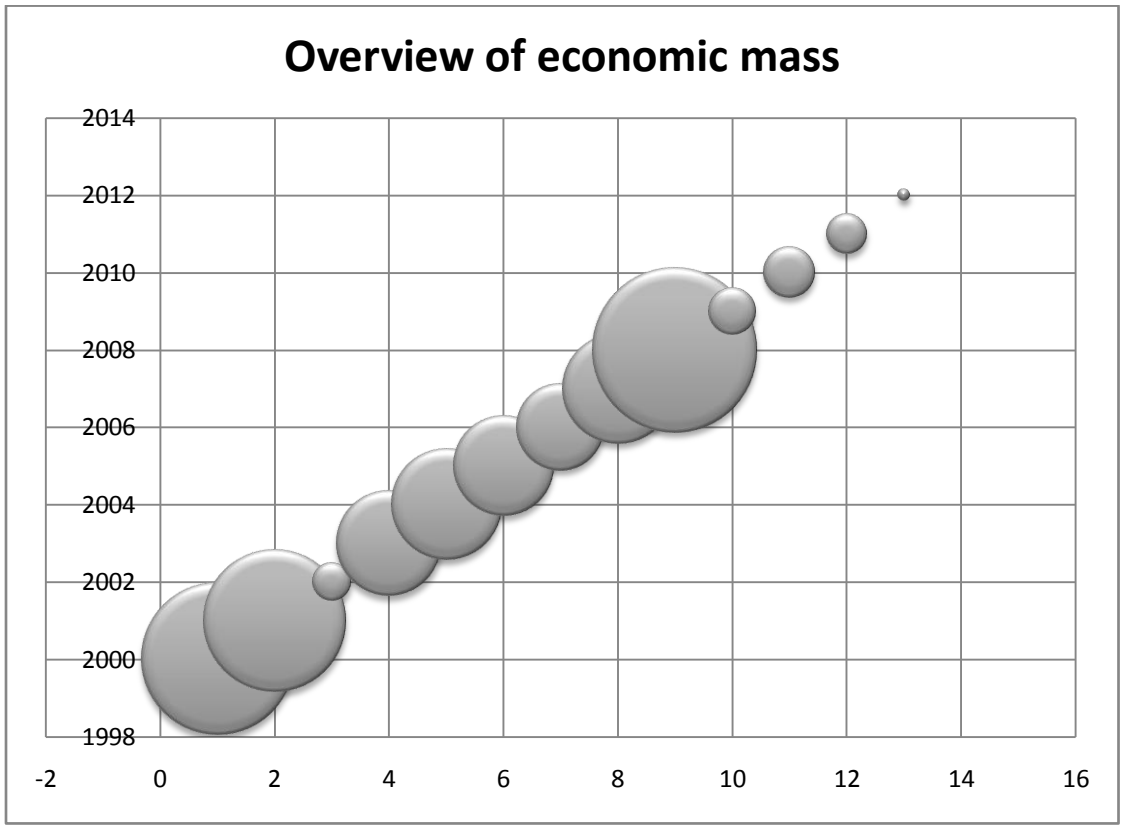
$$\boldsymbol{M = 4/3\pi G^3}$$

Table 1: The Calculation of Economic Mass

Years	G	,4/3	π	G^3	M (mass)
2000	7.3	1.333	3.14	389.017	1628.277
2001	7	1.333	3.14	343	1435.668
2002	2.9	1.333	3.14	24.389	102.0831
2003	5.7	1.333	3.14	185.193	775.1475
2004	5.9	1.333	3.14	205.379	859.6384
2005	5.5	1.333	3.14	166.375	696.3825
2006	5	1.333	3.14	125	523.2025
2007	5.9	1.333	3.14	205.379	859.6384
2008	7.7	1.333	3.14	456.533	1910.874
2009	3.3	1.333	3.14	35.937	150.4186
2010	3.5	1.333	3.14	42.875	179.4585
2011	3	1.333	3.14	27	113.0117
2012	1.3	1.333	3.14	2.197	9.195807

Source: INSTAT

Figure 1: Overview of economic mass



In year 2000 we see a greater mass of the economy it is due, among other things, a better performance in agricultural production. Inflation in controlled rates. Fiscal and monetary indicators are within specified quantitative targets. The level of implementation of income and expenditure and therefore the budget deficit was satisfactory.

Also it is important to evaluate that in September 2000, Albania joined the World Trade Organization (WTO), under which the country's trade policies now driven by global trade regulatory system. Our country was committed to a maximum fee of 20% initially, which under the agreement come to their reduction.

Can observe economic mass of the economy of Albania who suffers a strong contraction betweenperiod 2002/2003 and 2011/2012.

In year 2003, Albania started negotiations with the EU, for the signing of the Stabilization and Association Agreement (SAA), where in attention were the technical negotiations for industrial and agricultural products. This agreement was signed in 2006 in Luxembourg. Under this agreement the customs tax that will apply to industrial products with EU will be treated with zero customs duty, and also for a part of agricultural products. In the period2007-2008 Albanian economy is satisfactory.

In 2010, the Albanian economy has been affected by the global economic and financial crisis, mainly as a result of lower foreign demand and remittances, higher risk premiums andthe reduction of financial support and with higher costs.

The period 2010-2012 was characterized from a declined growth rate as a result of thereductionof the country's economic mass.

The concern stems from the uncertainty of securing the necessary financial means to cope with high volumes of imports, as long as external funding is expected to fall and remittances from emigrants can also be expected to decline in the medium term. In these circumstances, the export promotion policies receive a special priority, especially in the long term, alongside existing spaces for import substitution policies in the short term.

CONCLUSIVE REMARK

The economic mass is an indicator used in the modeling of international trade such as gravity models where the mass is of great importance in these models. This study intended to build an indicator that will display the economic mass of Albanian economy in years using the volume of spheres. On the basis of extensive analysis of the data which was taken from the statistics office INSTAT Albania, It could be concluded that economic mass are likely to show economic sizes by the use of volume of spheres. This helps us in the process of visualization of the behavior of GDP in years. Finally, this indicator helps us to visualize in a simple way the behavior of the economy from a point of view that we are not learned before.

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