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# Expert Journal of Economics

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# Editor's Introduction to Volume 3, Issue 3 of Expert Journal of Economics

Simona VINEREAN\*

Sprint Investify Research Unit

The second issue of the third volume of *Expert Journal of Economics* presents very interesting studies that investigate macroeconomic issues from different geographical frameworks and valuable global applications. This issue encompasses papers on equilibrium at the Euro Area, gravitational model and territorial attractiveness, the relationship between national morality and anti-trafficking policy. Further, I present a short description of each article published in *Expert Journal of Economics*, vol. 3, issue 2.

The first article of this issue, namely '*Analysis of Equilibrium at the Euro Area Level from a New Model Perspective*', authored by Alin Opreana, examines issues related to equilibrium at the Euro Area, through various research methods, such as exploratory factor analysis and structural equation modeling. The author proposes a model of equilibrium in the Euro zone, an area characterized by the existence of market with turbulence and search frictions.

In '*Accessibility to Nodes of Interest: Demographic Weighting the Logistic Model*', Gioacchino de Candia provides theoretical contributions to the field of spatial analysis, by developing a system of weights based on the resident population dynamics, in order to exhibit the degree of distribution of the services offered to the population, in terms of the infrastructure in a particular area. The author's analysis uses a gravitational model, based on the assumption of territorial attractiveness and helped improve the map of the accessibility.

In '*Human Trafficking and National Morality*', William R. DiPietro uses a cross country analysis to study the relationship between national morality and anti-trafficking policy. The author also extends the research by adding, besides national morality, three control variables which serve as possible influences of the anti-trafficking policy, namely democracy, share of the private sector in the economy, and globalization.

## A Final Thought

Our Editorial Board would like to extend our appreciation to our the Authors for choosing Expert Journal of Economics as their scientific publishing outlet, to our Reviewers for their involvement and their input on the articles published in this issue, and to all the Readers and Researchers for downloading, citing, and expanding on the theoretical and empirical economics article we publish.



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# Analysis of Equilibrium at the Euro Area Level from a New Model Perspective

Alin OPREANA \*

Lucian Blaga University of Sibiu

*This paper aims to address issues related to equilibrium at the Euro Area. Research methodology implies a wide range of methods and techniques that are used to analyze macroeconomic phenomena and processes at the Euro Area. Following the empirical analyses, namely exploratory factor analysis and structural equation modeling procedure, we propose a model of equilibrium in the Euro zone, an area characterized by the existence of market with turbulence and search frictions. Using this econometric modeling technique, we test and estimate causal relationships that combines a series of empirical data and quantitative causal hypotheses.*

**Keywords:** equilibrium, gross domestic product, interest rate, Euro Area

**JEL Classification:** D58, R13

## 1. Introduction

The economic reality is characterized by the existence of large and numerous interdependencies between markets. Equilibrium is a central concept of modern economic analysis describing situations which economists do not claim they could always occur, but which serve as reference for studying concrete situations.

The most important theories regarding economic equilibrium and disequilibrium were those enunciated by Alvin Marshall, Walras Leon and John Maynard Keynes, and based on their work followed other developed theories regarding an economy's phenomena. However those who addressed equilibrium from the perspective of an open economy were Mundell (1963) and Fleming (1962). The two of them have developed independently a model that studied the simultaneous equilibrium of the goods and services market, money market and balance of payments. As an overview of these developments and continuous evolution of macroeconomic theory, Mankiw (2010) proposed a synthesis of the economic models under a 7 equation model.

Since 2007, the global economy has been going through an experience that highlighted not only the flaws in the prevailing economic models, but also the negative aspects of human society, which led to the collapse of a sense of trust.

Based on these aspects, this paper intends to describe the results of research and equilibrium analysis in the context of new mutations at the level of the European Union and the Eurozone. The purpose of this paper is to empirically determine an equilibrium model for the European market. The aim of these analyzes is to conduct a research at the Euro Area level and to determine an equilibrium model for the markets with turbulence and search frictions.

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The starting point in this approach is that the unpredictability of econometric models regarding the appearance of a crisis requires the use of models that introduce new variables in equations systems designed to integrate the features of the new stage of normality. Since 2009, Kotler and Caslione have claimed that this new stage is characterized by the existence of economic turbulence caused by a set of critical factors.

## 2. Research Methodology

Research methodology is considering using a variety of strategies, methods and techniques that are used to analyze the aspects, phenomena and processes of aggregated macroeconomic at the level of the European Union and the Euro Area.

For the final empirical research, which will propose an equilibrium model for markets with turbulence and search frictions for which we will use the structural equation modeling procedure. Using this technique of econometric modeling, causal relationships are estimated and tested by combining a series of empirical data and quantitative causal hypotheses.

For the empirical analysis, we will use the Amos SPSS software for testing the suggested hypotheses. Thus, we will use macroeconomic time series for the variables that characterize the Euro Area (19 Member States). These time series were obtained from Eurostat, the European Central Bank and European Commission.

*Table 1. Variables and time series used in the empirical research*

Period	Variables
2001q1-2015q2	GDP (EA19_Y)
2001q1-2015q2	Consumption (EA19_C)
2001q1-2015q2	Government Consumption (EA19_G)
2001q1-2015q2	Investments (EA19_I)
2001q1-2015q2	Exports (EA19_EX)
2001q -2015q2	Imports (EA19_IM)
2001q1-2015q2	Balance of Trade (EA19_NX)
2001q1-2015q2	Taxes (EA19_T)
2001q1-2015q2	Interest Rate (EA19_R)
2001q1-2015q2	Monetary Base (EA19_M)
2001q1-2015q2	Prices (EA19_P)
2001q1-2015q2	Balance of Payments (EA19_BP)

For the empirical analysis of the equilibrium at the level of the Euro Area, a zone which is characterized by the existence of markets with turbulence and search friction, we will use exploratory factor analysis and structural equation modeling procedure. These econometric modeling techniques will be used to test and estimate the causal relationships, using a combination of series of empirical data and quantitative causal hypotheses.

## 3. Exploratory Factor Analysis for GDP Components

To analyze the structure of GDP and the relationships established between the GDP components, we will apply an exploratory factor analysis. The results obtained from this analysis help identify factors that will lead to a better comprehension of the structure of GDP and which will be introduced in the Euro Area's equilibrium model.

In this research, exploratory factor analysis (EFA) was used to provide a summary of the components of gross domestic product for the Eurozone. In this regard, the many components will be summarized by a smaller number of factors. The EFA was compiled in SPSS using the Principal Components extraction technique and the Varimax rotation method.

By implementing the EFA, we proceeded to explore the total variation for the exploratory factor analysis. Table 4.9 shows the number of selected factors (in this case, two factors), and the variation in each case, before and after the rotation.



**Table 2. Exploratory factor analysis results for 3 extracted factors**

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.749	68.719	68.719	2.749	68.719	68.719	2.328	58.189	58.189
2	1.072	26.788	95.507	1.072	26.788	95.507	1.493	37.319	95.507
3	.178	4.456	99.964						
4	.001	0.036	100.000						

The criteria used for determining the factors was that each element should have an eigenvalue greater than 1 (Field, 2013, p.642). Also, the eligibility of the factors can also be seen in terms of the variance explained by each resulted factor, exceeding 70%, namely for this first applied EFA the total variance explained is 95.507% (Table 2).

Table 3 helps to determine the representativeness of the components, which can be used to observe the most relevant variables each of two newly formed factors.

**Table 3. Rotated components' matrix**

	Component	
	F1_CGI	F2_NX
EA19_G	<b>0,816</b>	0,533
EA19_C	<b>0,876</b>	0,473
EA19_I	<b>0,944</b>	-0,197
EA19_NX	0,066	<b>0,973</b>

Note: EA19\_G = government consumption, EA19\_C = consumption, EA19\_I = investments, EA19\_NX = trade balance

Following the results of the exploratory factor analysis, we have obtained two factors, namely factor 1 (F1\_CGI) which is influenced by the consumption (both personal and governmental) and investments, and factor 2 (F2\_NX) which is mainly determined by the trade balance.

Table 4 presents the weights that can be used to obtain the factors' scores by multiplying the coefficients presented in this table (Table 4) and the standardized variables. The factors' scores represent the composite and estimated scores for each record in the database from the derived factors (Malhotra, Birks, 2009 p.629).

**Table 4. Coefficients matrix for factors' scores**

	Component	
	F1_CGI	F1_CGI
EA19_G	0,282	0,220
EA19_C	0,327	0,157
EA19_I	0,527	-0,389
EA19_NX	-0,207	0,752

Note: EA19\_G = government consumption, EA19\_C = consumption, EA19\_I = investments, EA19\_NX = trade balance

Factors represent linear combinations of the original variables that can be calculated as follows:

$$F_i = W_{i1}X_0 + W_{i2}X_1 + W_{i3}X_2 + \dots + W_{ik}X_k$$

$$F_{1\_CGI} = 0,282G + 0,327C + 0,527I - 0,207NX$$

$$F_{2\_NX} = 0,220G + 0,157C - 0,389I - 0,752NX$$

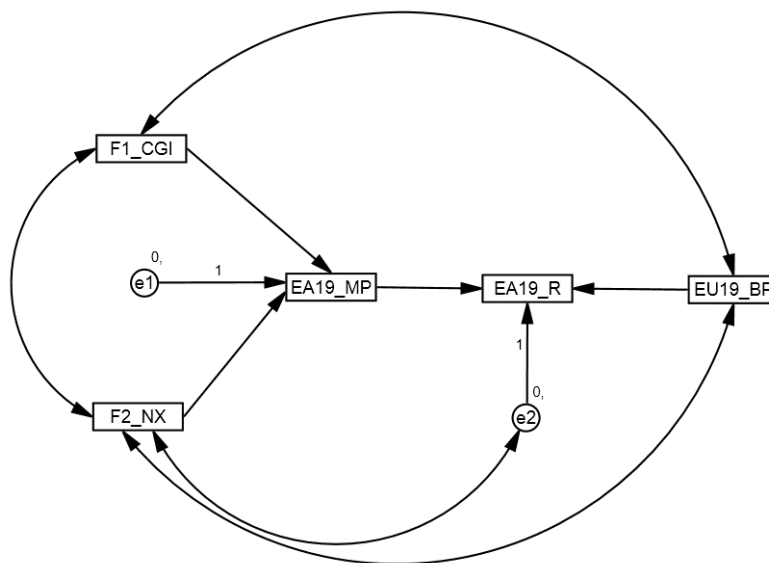
#### 4. Structural Equation Model for a New Euro Area's Equilibrium

The two factors obtained in the preceding stage (F1\_CGI and F2\_NX) will join variables that characterize the money market (namely, money supply and interest rate) and the BP variable (namely, balance of payments which summarizes the relations of the Eurozone with rest of the world) in a model of structural equations which characterizes the market equilibrium of the Euro Area, which in turn is influenced by turbulence and search friction.

To determine and test the structural equation model that characterizes equilibrium in the Euro Area, we propose the following hypotheses:

- H1:** F2\_NX has a positive influence on the money supply at the Euro Area
- H2:** F1\_CGI has a positive influence on the money supply at the Euro Area
- H3:** Money supply has a negative influence on interest rate
- H4:** Balance of payments has a negative influence on interest rate
- H5:** F1\_CGI and F2\_NX influence each other in a positive relationship
- H6:** Balance of payments and F1\_CGI are inter-correlated
- H7:** Balance of payments and F2\_NX are inter-correlated
- H8:** F2\_NX is inter-correlated with other unobservable factors of interest rate

These proposed relationships that will be examined by structural equation modeling are shown in Figure 1, consistent with the proposed hypotheses.



**Figure 1.** Equilibrium model proposed for the Euro Area

Note: F1\_CGI= GDP’s components of consumption and investments, F2\_NX = GDP’s component of trade balance, EA19\_MP = monetary base/price, EA19\_R = interest rate, EA19\_BP = balance of payments, e1 = unobserved factors of monetary base/price, e2 = unobserved factors of interest rate

Using the theoretical basis and the results of the exploratory factor analysis, structural equation modeling was used to test the hypotheses of the proposed model in this section. The testing of the model will follow the criteria set by Hu and Bentler (1999, p.27) and developed in Table 5, denoting the eligibility of the newly proposed model.

**Table 5.** Model accuracy

Indicator	Model	Recommended values
$\chi^2$	6.605 (p=0.037)	$p \leq 0.05$
$\chi^2/df$	3.303	$\leq 5$
NFI	0.982	$\geq 0.90$
RFI	0.909	$\geq 0.90$
CFI	0.987	$\geq 0.90$
RMSEA	0.201	$\leq 0.10$

Note:  $\chi^2$ =Chi-square,  $\chi^2/df$  = ratio of Chi-square and degrees of freedom, NFI = Normed fit index, RFI = Relative fit index, CFI = Comparative fit index, RMSEA = Root mean square error of approximation.

Overall, the proposed model has been established as relevant in terms of the accuracy indices, however, the calculated value of 0.201 for the root mean square error of approximation exceeds the stated

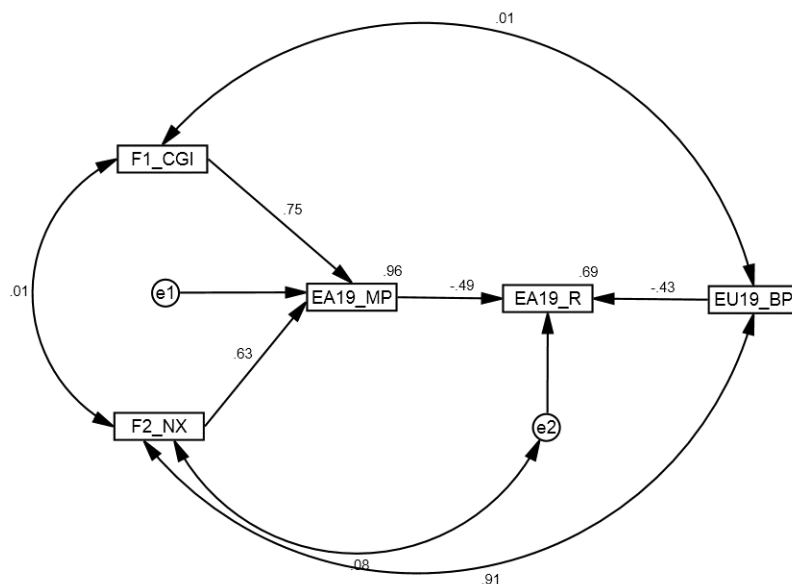
acceptable level. This is mainly due to the low number of observations and computing conditions set out in Amos.

The structural equation model implies a process entitled path analysis that uses bivariate correlations to estimate relationships in a system of structural equations. This process estimates the strength of each structural relationship in a path chart based on previously developed equations (Hair et al., 2010, p. 625). The structural relationship between two concepts is the empirically represented by an estimate of the structural parameter or path estimate (Hair et al., 2010, p. 702).

### 5. Results and Conclusions

The results of the longitudinal research show the validity of the proposed model for determining equilibrium at the Euro Area, which is characterized by the existence of turbulence and search friction.

Table 3 reflects information on the standardized estimates of regression weights, statistical significance, standard error, and the associated equations. Figure 2 offers a visual perspective of the standardized solution of the model. All hypotheses are confirmed in this newly proposed model.



**Figure 2.** Standardized solution of the structural equation model associated with Euro Area’s equilibrium

Note: F1\_CGI= GDP’s components of consumption and investments, F2\_NX = GDP’s component of trade balance, EA19\_MP = monetary base/price, EA19\_R = interest rate, EA19\_BP = balance of payments, e1 = unobserved factors of monetary base/price, e2 = unobserved factors of interest rate

**Table 6.** Structural equation model results for a new Euro Area’s equilibrium

Hypotheses	Standardized Regression Weights	Standard Error	Significance	Hypothesis Result
H1: F2_NX → EA19_MP	0,629	21458,980	***	Confirmed
H2: F1_CGI → EA19_MP	0,746	21458,414	***	Confirmed
H3: EA19_MP → EA19_R	-0,486	0,000	***	Confirmed
H4: EA19_BP → EA19_R	-0,429	0,000	***	Confirmed
H5: F1_CGI ↔ F2_NX	0,007			Confirmed
H6: EA19_BP ↔ F1_CGI	0,012			Confirmed
H7: EA19_BP ↔ F2_NX	0,914			Confirmed
H8: e2 ↔ F2_NX	-0,085			Confirmed

Note: F1\_CGI= GDP’s components of consumption and investments, F2\_NX = GDP’s component of trade balance, EA19\_MP = monetary base/price, EA19\_R = interest rate, EA19\_BP = balance of payments, e1 = unobserved factors of monetary base/price, e2 = unobserved factors of interest rate

The summarized results in Figure 2 and Table 3 show that the GDP, through its related components, directly influences the money supply, however consumption and investment have a stronger influence than the trade balance. Instead, the situation is reversed when considering the relationships of GDP’s components with the balance of payments, aspects which are consistent with economic theory.

Another important observation is that trade balance negatively influences interest rate, and the same behavior is displayed by the money supply. Also, these aspects are consistent with theoretical knowledge.

However, following the validation of the model, at the Euro Area, we can observe a few major differences in comparison with existing econometric models. Examples in this regard are the GDP's structure, analyzed by the two factors (F1\_CGI and F2\_NX), and the investment model (a function dependent on taxes and interest rate).

These differences are mainly due to the difference of research approach. The determined model in this paper is a model characterized by the presence of turbulence and search frictions that characterizes the European Union, as an economic bloc, as well as the Euro Area.

### Acknowledgement

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# Accessibility to Nodes of Interest: Demographic Weighting the Logistic Model

Gioacchino DE CANDIA \*

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*This research fits into the genre of spatial analysis, aimed at better understanding of population dynamics in relation to the presence and distribution of infrastructure and related services. Specifically, the analysis uses a model of the gravitational type, based on the assumption of the impedance (attractiveness) territorial, based on a curve of type logistics to determine the accessibility of the same, to which to add a system of weights. In this sense, the model was weighted according to the population, to determine the level of “population served” in terms of infrastructure and related services included in the model.*

**Keywords:** *accessibility, regional development, impedance curves, territorial statistics, infrastructures, logistic form, weighted indices.*

**JEL Classification:** *O18*

## 1. Introduction

Over the past few decades, from the end of the 50s of XX century, the attention to a greater knowledge of the territories, the relative accessibility, attractiveness and consequent control of the same has affected more and more governmental authorities of the countries.

It has gone from a simple “personalist conception” of the territorial governance to approaches more and more technical - scientific, based on the possibility of obtaining information as capillaries in the area, as well as the application of real equations can explain the distribution of resources in the same territory, in order to better government.

A pioneer in this kind of approaches was Hansen (1959), who first applied a mathematical model called “gravity” to the territory.

The excellent results obtained by this author have prompted other researchers, subsequently, to continue on the path taken, as well as to test new approaches (Andy and Niemeier, 1997).

That is how the measures defined as “cumulative opportunities” and “the utilitarian choice”, due to the collaboration of multiple authors.

However, the approach of “gravity”, to date, has provided the highest and best contribution to the knowledge of the territory, also because it is the most objective among those produced so far.

The writer has had occasion to apply the gravity model, suitably elaborated, three Italian regions: Tuscany, Trentino - Alto - Adige and Friuli - Venezia – Giulia (de Candia and Chiocchini, 2014).

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For Tuscany was produced a real benchmarking, whereas three distinct functions of impedance (exponential, logistic and linear) summarizing the results both by arithmetic average, either by MPI (Mazziotta and Pareto, 2007).

For Trentino - Alto - Adige and Friuli - Venezia - Giulia was produced map accessibility and consequent attractiveness at the municipal level, whereas function of impedance is the logistic curve and synthesis by arithmetic mean, which has been shown to be the best approach to territorial representation.

This paper aims to provide a further contribution to the field, building a system of weights based on the resident population, in order to pinpoint what is the degree of distribution of the services offered to the population, in terms of infrastructure in the area.

## 2. Materials and Methods

The research focuses on the areas of Tuscany, which are analyzed for the presence of the following infrastructure: hospitals with emergency room, upper secondary grade schools, railway stations and airports.

Following the approach of gravity, we arrive at the following synthetic formulation:

$$A_i = \sum_{j \in D} W_j^\beta f(c_{i,j}, \alpha)$$

Where  $A_i$  is the accessibility of a resident of the area  $i$  with respect to the node  $j$  in the region  $D$ ,  $W_j^\beta$  is a measure of the activities or services (mass of opportunity) located in zone  $j$ ,  $\beta$  is a calibration parameter (used to account for the effects agglomeration) and  $f(c_{i,j})$  is a function of impedance generally decreasing with the cost (or with the distance or travel time).

Using the impedance in the form of logistics, we arrive at the following equation:

$$f(c_{i,j}) = \left( \frac{1}{1 + \exp - k(c_{i,j} - c_0)} \right)$$

with

$$c_0 = \frac{1}{2}(c_{min} + c_{max})$$

where

$c_{min}$  is the minimum cost

$c_{max}$  the maximum cost observed and

$$k = 2 \ln\left(\frac{1}{\gamma} - 1\right) / (c_{max} - c_{min})$$

$$\gamma > 0$$

To get good results,  $\gamma$  must be greater than zero, but not too big. Following previous approaches, which have proved more encouraging that, there is  $\gamma$  equal to 0.05.

The summary of the results is achieved by weighted arithmetic mean, using the resident population as calculated from the XV Census of the Italian population and housing.

Were produced two different approaches, one called “weighted average”, the other “index weighted average” according to the following formulations:

$$\mu_i = \frac{\sum_{ij} (x_{ij}/p_i) * 100}{\mu = \sum_{ij} \mu_i / n} \quad (\text{Weighted average})$$

$$\mu_i = \frac{\sum_{ij} (x_{ij} p_i) / p_i}{\mu = \sum_{ij} \mu_i / n} \quad (\text{Index weighted average})$$

where

$x_{ij}$  is the impedance function developed for the common  $i$  and for infrastructure  $j$ ,

$p_i$  is the population of the municipality,

$\mu_i$  is the weighted arithmetic mean for each municipality  $i$ .

### 3. GIS Analysis to Calculate Impedance Distances

The impedance distance (travel time) were calculated through the GIS software ArcGIS Network Analyst module. For the calculation is used the road graph Multinet of Tom Tom where the data on road conditions are updated at the end of 2013. The starting points used as source data are the centroids of the municipalities of Tuscany (ISTAT 2012) and centroid of the sub-municipal areas (ISTAT 2010) only for the city of Florence. The destination points used are all the considered infrastructures (hospitals, railway stations, secondary schools and airports). The infrastructure used are derived from georeferencing public administrative archives and these are integrated with the Point of Interest that are included in the graph road datasets. The facilities used, are:

- Railway stations (platinum, gold e silver) year 2012 RFI (Railway Italian Infrastructures) source;
- Airport year 2010 ENAC (Italian Civil Aviation Authority) source;
- Public and private hospital with first aid year 2007 Health and Care Ministry source;
- Secondary school year 2011 Ministry of Education source.

The output OD cost matrix, that is the result of GIS processes, consists of all drivetime and kilometric distances from origins to destinations. The calculations are performed in ideal conditions and in the absence of traffic and using a traveling speed that is set on the road graph. The traveling speed used, is referred to the highway code speed and to road signs contained in the updated road graph. The tool used is ArcGIS “find closest facilities” contained in the Network Analyst package; this tool allows you to calculate all the driving distance starting from closest to farthest.

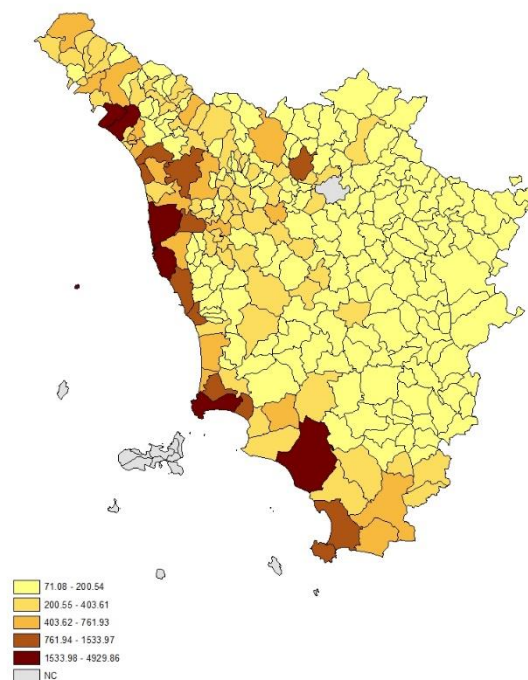
### 4. Results and Discussion

The Tuscan territory is divided administratively into ten provinces: Arezzo, Florence, Grosseto, Livorno, Lucca, Massa - Carrara, Pisa, Pistoia, Prato, and Siena. There are in total 287 municipalities and 3,672,202 inhabitants, according to the latest Census of Population and Housing (ISTAT, 2011).

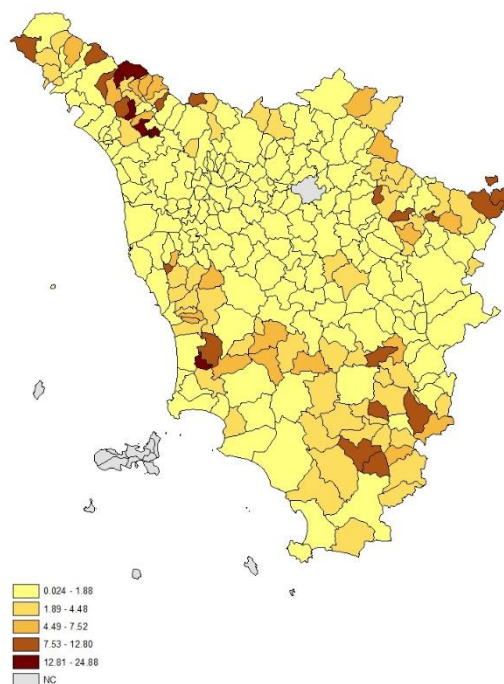
In developing the model, as explained above, we proceeded to isolate the metropolitan area of Florence, for which data on districts were available.

Also, have been eliminated island communities (as “isolated” by definition) resulting in a matrix of impedance functions for the remaining 276 municipalities.

The results of the weighted models are summarized in the pie charts below:



*Figure 1. Synthesis of the model by index weighted average*



**Figure 2.** *Synthesis of the model by average weighted*

The pie charts show the results are quite dissimilar between the two models. In particular, the weighting obtained with “weighted average index” shows a situation “in leopard spots”, where the municipalities are served less than riparian, with the area between Florence - Pisa - Livorno, which records accessibility of medium - low, depending on the population served by infrastructure.

Conversely, municipalities pertaining to the part of the Apennine region are those that are best served.

This weighting system shows its limits, as the common Apennines are among the least accessible (and therefore attractive) in terms of infrastructure in the area. The work already published by the authors (de Candia and Chiocchini, 2014), therefore, lead to reject this weighting system.

With regard to the synthesis achieved by “weighted average”, the results presented in Figure 2 show a more homogeneous. In general, the Tuscan towns showed a good accessibility on the population served. The common “least served” are those of the Apennines bordering Umbria and partly those bordering Lazio. A similar situation for ordinary Apennines bordering Liguria.

In addition, the area between Florence - Pisa - Livorno with the best infrastructure, the best is the one with the population served.

In fact, the system “weighted average” works like this: low accessibility and low population pays a low rate for the population served; high accessibility and high population corresponds to a high rate for the population served.

In between, common from time to time show medium - low to medium - high rates for the population served.

#### **4.1. Florence**

The metropolitan area of Florence is divided into five districts: Centro storico, Campo di Marte, Gavinana - Galluzzo, Isolotto - Legnaia e Rifredi.

With a population of 358,079 inhabitants, is the most populous region.

For the city of Florence was made to develop the model of synthesis only according to the “weighted average” (not very useful given the results obtained with the synthetic “index weighted average” using only hospitals equipped with first aid (distributed by area) in analyzed as other infrastructure (airports, railway stations) are present in only “exemplary” (respectively “Leonardo da Vinci” and “Santa Maria Novella”). As for the upper secondary school level, data there is no comprehensive mapping and ultimately for the same constituency.



**Table 1.** Summary by “weighted average” for districts

Districts	Population 2011	Weighted average
Isolotto - Legnaia	66,430	0.00063
Centro Storico	62,516	0.00068
Rifredi	102,834	0.00042
Gavinana - Galluzzo	39,663	0.00109
Campo di Marte	86,636	0.00052

Table 1 summarizes the data on population for districts of the city of Florence (ISTAT, 2011) and summarizes the impedance function in the form of logistics according to the “weighted average”.

The results show a great addition plexus hospital for each district, as well as a strong homogeneity between the districts themselves.

If you want to try the classic “nit-picking” the district Galluzzo - Certosa shows the index lower, further proof that good accessibility but low population corresponds to a lower index of population served. It is, however, of infinitesimal.

## 5. Conclusions

Research has further helped to define and improve the map of the accessibility in relation to the territorial breakdown at local authority in which the authors have been discussing extensively in the past.

The addition of a weighting system that takes into account the “population served” not only contributes to the improvement of the primitive model, but adds a new connotation and new information available to policy makers and governance of the territory.

In addition, the report also has carried a real benchmarking between the approach called “index weighted average” and the approach “weighted average”, preferring the latter.

Further progress in the application of such a model of accessibility weighted territory can be applied and extended in other regions (as in the authors'), but also in new infrastructures, economic data and environmental data, according to the availability of data and the degree of capillarity of information of local authority.

## 6. Acknowledgements

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# Human Trafficking and National Morality

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*The paper proposes that national morality is an important variable for explaining national anti-trafficking policy. It uses cross country regression analysis to see whether or not empirically national morality is a determinant of anti-trafficking policy. The findings of the paper are consistent with the notion that improved levels of national morality lead to better national anti-trafficking policy. National morality is found to be statistically relevant for national anti-trafficking policy when controlling for the extent of democracy, the share of the private sector in the economy, and the degree of globalization.*

**Keywords:** Human Trafficking, Human Trafficking Policy, National Morality

**JEL Classification:** Z00, Z1

## 1. Introduction

Human trafficking can be defined as the forced transportation of human beings against their will for the purpose of exploitation. While presumably, slavery was abolished long ago in most western countries, and, in the U.S.A. a horrendous civil war was fought to decide the issue of slavery, it is thoroughly reprehensible that, in our modern, technologically sophisticated, civilized world, human trafficking flourishes. Gaining some understanding of the causes of human trafficking and of the determinants of effective anti-trafficking policy is essential in order to begin to rationally address this inhumane problem.

This paper hypothesizes that higher levels of national morality can lead to better national anti-trafficking policy. If this proves to be the case, then improving national morality in countries around the world is one promising avenue for reducing human trafficking

Anticipating the results, upgrading national morality in order to better anti-trafficking policy can be undertaken by using two fundamental steps. The first is to make people more moral, and more sensitive to immoral behavior. Even from a strictly secular basis, a country can move in this direction by incorporating moral behavior as significant part of its national identity, and through its educational system. The second step is to make people more aware of the existence, the extent, and the horrific nature of human trafficking, that is to say, to bring it before their eyes, to the forefront of their consciousness. A hidden problem is a problem that is not likely to be addressed. Hiding the ugly consequences of immoral behavior is apt to increase immoral behavior by lowering its cost both in terms of personal guilt and with regard to social opprobrium.

The paper, aiming to see whether anti-trafficking policy depends on national morality, is divided into additional sections. The second section provides an overview of some of the recent literature with regard to anti-trafficking policy. The third section presents a model of anti-trafficking policy. The fourth section

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discusses the variables that will be included in the empirical analysis. The fifth presents and discusses the results of cross country regressions of anti-trafficking policy on national morality and on other variables. Lastly, the sixth section summarily concludes.

## 2. Some Relevant Literature

In addition to creating their index of anti-trafficking policy, Cho, Dreher, and Neumayer employ spatial autoregression on a panel consisting of one hundred seventy seven countries for the years 2000 through 2009 with their anti-trafficking index as the dependent variable to see if policy choices in one country are spatially dependent on policy choices made by other countries (Cho, Dreher, and Neumayer 2011). They find that both a contiguity weighted spatial variable and a voting weighted spatial variable are statistically relevant for overall country anti-trafficking policy. What is more, among their control variables, the level of democracy, the control of corruption, and the extent of woman's rights also appear to be favorable forces for anti-trafficking policy, while U.S. aid, and the level of economic development do not appear to matter.

Rudolph and Schneider use a holistic multiple indicators multiple cause's structural equation model to obtain measures of the unobservable variable of interest, human trafficking inflows, for the years 2000 to 2010 (Rudolph and Schneider 2013). For getting their human trafficking inflows estimates and for providing insights into human trafficking, their basic model considers four causes of human trafficking intensity (log of GDP per capita, log of FDI stock, percentage of agriculture to GDP, and language fractionalization), and three indicators of human trafficking intensity (the crime rate, the Cho, Dreher, and Neumayer's policy index, and the number of identified victims).

Cho employs extreme bound analysis on an enormous number of regressions she runs on three different human trafficking data sets consisting of data on one hundred eighty countries for the years are 1995 through 2010 in order to identify robust determinants of outflows and of inflows of human trafficking (Cho 2012). Out of seventy eight push factors that she considers as potential sources of human trafficking outflows, her most robust negatively related push factors are log of per capita income, the percentage of Muslims in the population, the fertility rate, and the size of the food, beverage and tobacco industries. Her two most robust positively related push factors are the size of the information flow, and being a transition economy. From the sixty seven potential pull factors that she investigates as possible reasons for human trafficking inflow into countries, her single most robust negatively related pull factor is the size of the information flow, while her most robust positively related pull factors are the log of per capital income, the log of FDI to GDP, and language fractionalization.

Using averages over the period 2000 to 2010 for the Cho, Dreher, and Neumayer anti-trafficking policy index and its three components, Potrafke undertakes cross country regression analysis to investigate the effect of religion on anti-trafficking policy (Potrafke 2013). He finds that countries with greater Moslem majorities have more lax anti-human trafficking policies, and that the effect is more pronounced the more dictatorial (less democratic) the country. In addition, among the control variables the uses, he discovers that lower corruption and bigger population size are favorable for anti-trafficking policy, but that per capita GDP does not seem to be important.

Contrary to what one might expect on the basis of economic theory that greater scarcity of women relative to males would make women more valuable and thereby give women greater rights, Prakash proposes that, at least for India, given India's particular cultural characteristics, that higher sexual imbalance (more females to males in the population) leads to greater trafficking of women (Prakash 2014). Consistent with his contention, his regressions on a panel of Indian states for the years 1980 through 2011 show that a higher child sex ratio, measured in terms of males per thousand in the population, is associated with increased trafficking between Indian States.

In contrast to many who argue that internal factors, such as poverty, war, and cultural factors, are the major drivers of human trafficking in Africa, Njoh and Ayuk-Etang believe that external factors, such as the replacement of indigenous culture by foreign culture, are the real problem (Njoh and Ayuk-Etang 2012). Using data on forty seven African countries, they run regressions of Cho, Dreher, and Neumayer's overall anti-trafficking policy index and its three sub-indexes of prevention, prosecution, and protection on the percentage of Christians, the percentage of Moslems, the percentage of African Religion, and literacy rates. Their results show that while greater literacy rates, which they interpret as a marker of greater western influence, has, in line with their beliefs, a statistically significant negative influence on anti-trafficking policy, the percentage of the population with African Religion, contrary to their expectations, also has a statistically significant negative influence.

Hernandez and Rudolph use a gravity style model to try to explain the number of human trafficking victims per year for each of one hundred and twenty source countries to thirteen European host countries for the years 1998 to 2009 (Hernandez and Rudolph 2011). Among their findings are, first, that income differentials between source and host country, the total population of source and destination countries, the amount of origin country migrants in the destination country, and the number of origin country refugees in the destination country are all significantly positively related to trafficking from a source country to a destination country; second, that both geographic distance between origin and source country, and the extent of law and order in the host country are significantly negatively related to human trafficking from a source country to a destination country; and, finally, third, that neither prostitution regulation in the host country, the extent of women's rights in the source country, the homicide rate in the host country, or the homicide rate in the source country are significant drivers of trafficking from a source country to a destination country.

### 3. Simple Anti-Human Trafficking Policy Model

The theoretical model of anti-human trafficking policy consists of a single equation with an accompanying partial derivative. The equation with its associated partial derivative is as follows.

$$A = f(M, C) \quad \delta A / \delta M > 0$$

In the model's equation, *A* stands for the extent of national anti-trafficking policy, *M* represents the level of national morality, and *C* is a set of control variables. The model's lone partial derivative between national anti-trafficking policy and the level of morality is positive. As a whole, the model suggests that national anti-trafficking policy depends on national morality and on a set of control variables, and that, after adjusting for other relevant variables, the relationship between anti-trafficking policy and national morality is positive.

If morality means anything, then at a minimum it provides some constraint on individual undertaking of undesirable behavior. The whole notion of morality is to get people to behave in an ethically appropriate manner, and to avoid behaving in an ethically inappropriate manner. Morality develops and molds individual conscience, which becomes a force in individual decision making. It makes it more costly for an individual to engage in abhorrent behavior because of guilt, and because of perceived or actual negative views of others, and because of potential consequences from the judgment of others.

Besides national morality, three control variables are also considered as possible determinants of anti-trafficking policy.

The first is the extent of democratic government. Greater democracy is expected to have a positive effect on anti-trafficking policy. The reason is that, because democracy gives some political power to the common man, democracy has more concern for the common man, and it allows all groups, even highly marginalized groups, to have some impact on the government and on government policy. That is to say, as a general rule, a more democratic government is more sensitive and more responsive to the people.

The second control variable is the share of the private sector in the economy. It is anticipated that a bigger private sector share in the economy leads to better anti-trafficking policy. Culturally, societies can range all the way from an individualistic orientation, with individuals as individuals being important in and of themselves, to a more collective orientation, in which it is the nation that matters, and individuals are seen solely from the perspective of the nation as a whole. To say it a little differently, at the one extreme, there is no real society and society is simply a collection of individual human beings, and, at the other extreme, only the collective such as the nation matters, with individual identity completely subsumed in the collective identity. Thus, the more privatized an economy, the more capitalistic the economy, the more people define themselves as individuals, and as a consequence, the greater will be the tendency of the society to place emphasis on the individual and on individual rights.

Given the continuing integration of the world economy, the final control variable included is the extent of globalization. The expected sign on this variable is ambiguous. On the one hand, greater integration of a country with the world economy is likely to make a country more sensitive to world pressure, including world pressure in terms of improved human rights. This suggests a positive relationship between anti-trafficking policy and globalization. On the other hand, globalization increases the channels for movement of goods and services, including the trafficking of human beings, between nations. This latter suggests a negative relationship between anti-trafficking policy and globalization

#### 4. Data Sources for Variables

The measure of the strength of anti-trafficking policy is the anti-trafficking policy index developed by Cho, Breher, and Neumayer (Cho, Dreher, and Neumayer 2011). The data is downloaded from the Human Trafficking website (human Trafficking 2014). The index ranges from a low value of three to a high value of fifteen with higher values representing better anti-trafficking policy. It is constructed by rating three component of anti-trafficking policy the prosecution of traffickers, the prevention of trafficking, and the protection of victims, from one to five, and adding the results.

National morality is quantified by using Crabtree's measure of national morality for the first, and, at present, the only year for which it is available, 2013 (Crabtree 2013). Crabtree's national morality measure is fairly comprehensive as it considers a wide variety of factors in its construction. For 2013, the Crabtree index ranges from 27.4 to 90.7. Higher values of the Crabtree index indicate greater national morality.

The measure of democracy is the 2010 democracy index of the economist intelligence unit of economist magazine (The Economist 2010). The democracy index can range from one to ten with higher values signifying greater levels of democracy.

The share of the private sector in the economy in 2010 is computed simply by subtracting the percentage of government spending to GDP for the year 2010 from one hundred percent. The numbers for the percentage of government spending to GDP for 2010 come from the World Bank (World Bank 2014).

Globalization is captured by utilizing the percentage of trade to GDP for the year 2010 with trade defined as exports plus imports. The data for the percentage of trade to GDP also comes from the World Bank.

#### 5. Empirical Results

Table I shows the results of cross country regressions of the Human anti-trafficking policy index on national morality and on other variables.

**Table 1.** Cross Country Regressions of Anti-Trafficking Policy Index on National Morality and Other Variables

	(1)	(2)	(3)	(4)
CONSTANT	3.612 (4.46) *	4.500 (6.02) *	-.0888 (-.047)	.0745 (.034)
MORALITY	.1071 (8.04) *	.0425 (2.27) **	.0431 (2.41) **	.0572 (3.06) *
DEMOCRACY		.5817 (4.75) *	.5878 (4.74) *	.5319 (4.26) *
PERPRIVATETO GDP			.0566 (2.91) *	.0556 (2.95) *
PERTRADETO GDP				-.0075 (-2.35) **
RSQ	.275	.411	.435	.459
N	173	159	144	143

The table consists of four different regression equations. The first is a simple regression using national morality as the sole explanatory variable. The next three equations cumulatively add a control variable as an additional explanatory variable, first starting with democracy in the second equation, followed by the percentage of the private sector to GDP in equation three, and, finally adding the percentage of trade to GDP in fourth equation.

The construction of the table is as follows. The first row numbers the regressions, the second to last row provides the r-squared values for the regressions, and the last row shows the number of countries (sample observations) for the regressions. The first column provides the potential explanatory variables. Each of the remaining columns shows the results of a single regression. For any variable that enters an equation the estimated coefficient is provided with its individual t-statistic underneath in parenthesis. Variables significant at the one percent level of significance or better in an equation are marked with a single asterisk under their individual t-statistic, while those significant at the five percent level or better are given two asterisks.

The results lend real support to paper's central hypothesis that higher levels of national morality positively influence anti-trafficking policy. National morality, as measured by Crabtree's morality index, is positive in all of the four regressions equations in table I. It is significant at the one percent level of significance or better in two of the four equations, equations one and four, and significant at the five percent level in the other two equations, equations two and three. When used on its own in the first equation, national morality explains over twenty seven percent of the cross country variation in the anti-trafficking index in a sample consisting of one hundred and seventy three countries.

The three control variables, democracy, the percentage share of the private sector in the GDP, and the percentage share of trade to GDP also appear to be relevant for anti-trafficking policy.

In line with theoretical expectations and the findings of past studies, the estimated coefficient on democracy is positive in the three equations that it enters, equations, two, three, and four. In every one of these equations democracy is significant at the one percent level of significance or better.

The percentage share of the private sector in the total economy is positive and significant at the one percent level of significance or better in both equations in which it appears, equations three and four, suggesting, as anticipated, that a more privatized economy with its greater focus on the importance of the individual is more conducive to better anti-trafficking policy.

Finally, in the single equation, equation four, that the measure of globalization, the percentage of trade to GDP, is employed, it is negative and significant at the five percent level of significance or better. This suggests that the negative channel enlargement effect on anti-trafficking policy due to globalization overwhelms any potential positive effect on anti-trafficking policy such as a country becoming more globally sensitive or globally influenced. Thus, while, perhaps, globalization may be favorable for economic development and economic growth, there appears to be a potential negative externality from globalization due to its negative effect on anti-trafficking policy that needs to be taken into consideration when a country considers greater globalization.

## 6. Conclusion

The cross country analysis of the paper provides support for the notion that greater country morality leads to better national anti-trafficking policy. Whether national morality is used alone in regressions to explain anti-trafficking policy or adjusting for various control variables, national morality proves to be a statistically significant positive determinant of anti-trafficking policy. In addition, the findings of the paper suggest that greater democracy and increased privatization of the economy are favorable for anti-trafficking policy, while greater globalization appears to be detrimental for anti-trafficking policy. Thus, in order to improve national anti-human trafficking policy it would be advisable for a country to work to improve national morality, to try to extend the scope of democracy and democratic institutions, and, culturally, to steer the country away from collective identity and more towards individual identity.

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# Polish Teachers' Salaries in 1990-2015

Antoni Józef JEŻOWSKI\*

*The earnings of the largest professional group financed with public resources, which participates in the realization and financing of the most common and the most expensive public service is the cause of industrial disputes on one hand, and pay aspirations on the other. At the same time the analysis of this phenomenon from the perspective of the public budget as the payer and the scientist-researcher as an analyst often leads to surprising conclusions concerning both the allocation of public means in time and social justice.*

**Keywords:** teacher, school, salary, public finance

**JEL Classification:** J31, I22

## 1. Introduction

The earnings of Polish teachers and school principals have rarely been the subject of scientific work over the past 70 years. Among the outstanding papers, we should mention one by Grażyna Michalak from 2002, covering the period of 1944-1992. It is a very educational publication, analyzing many elements of teachers' earnings, in various periods in history, especially as we realize the meanders of the Polish education system. Readers interested in this issue are strongly recommended to read the above book.

The system changes implemented at the turn of the 1980s and 1990s also affected education. Teachers constitute a large professional group working on a sensitive section covering education and upbringing, but also dealing with ideology, outlook on life, social issues and the whole spectrum of other issues. The changes also covered economic transformations, resulting from history and doctrine processes, attempting to locate again school in the structure of the state, pedagogy as science with obvious practical applications, and the teacher, whose position in the new solutions was far from obvious, though still unquestionable.

School at that time was of state nature, with centralized system of employing teachers, rewarding them and providing them with numerous covers, including social ones, whose goal was to hide the mediocrity of earnings and a low social status of pedagogues. The economic crisis of the 1980s was also reflected in the status of the profession and people performing it, whereas the end of the 1980s, with skyrocketing inflation, demonstrated that – just like the whole society – teachers acutely experienced the lack of stability of remuneration for their work.

It should also be pointed out that since 1982 the same Teachers' Chart has been valid, causing social repercussions, concerning for example common perception of various provisions included in it, which do not link the quality or the effectiveness of the teachers' work to the related remuneration.

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## 2. The System of Remuneration

The discussed period can be divided into two stages:

- the first, covering the first decade of transformation, that is 1990-1999, when, in accordance with the regulation of the Minister of National Education, teachers were automatically promoted every two years, depending on six levels of their education, until they reached 30 years of service;
- the second, after 2000, when the introduction of the professional promotion grades for teachers changed the pay scale, covering now four promotion grades and four education levels.

These different organizational solutions accounted for the situation in which in the first stage the teacher's pay rise was only determined by their length of service, while in the second stage it is the teacher who must take care of their promotion and indirectly, though not necessarily with their quality or effectiveness of work, "determine" the level of their remuneration, bearing in mind that the table is centrally generated by the state organ, namely the minister.

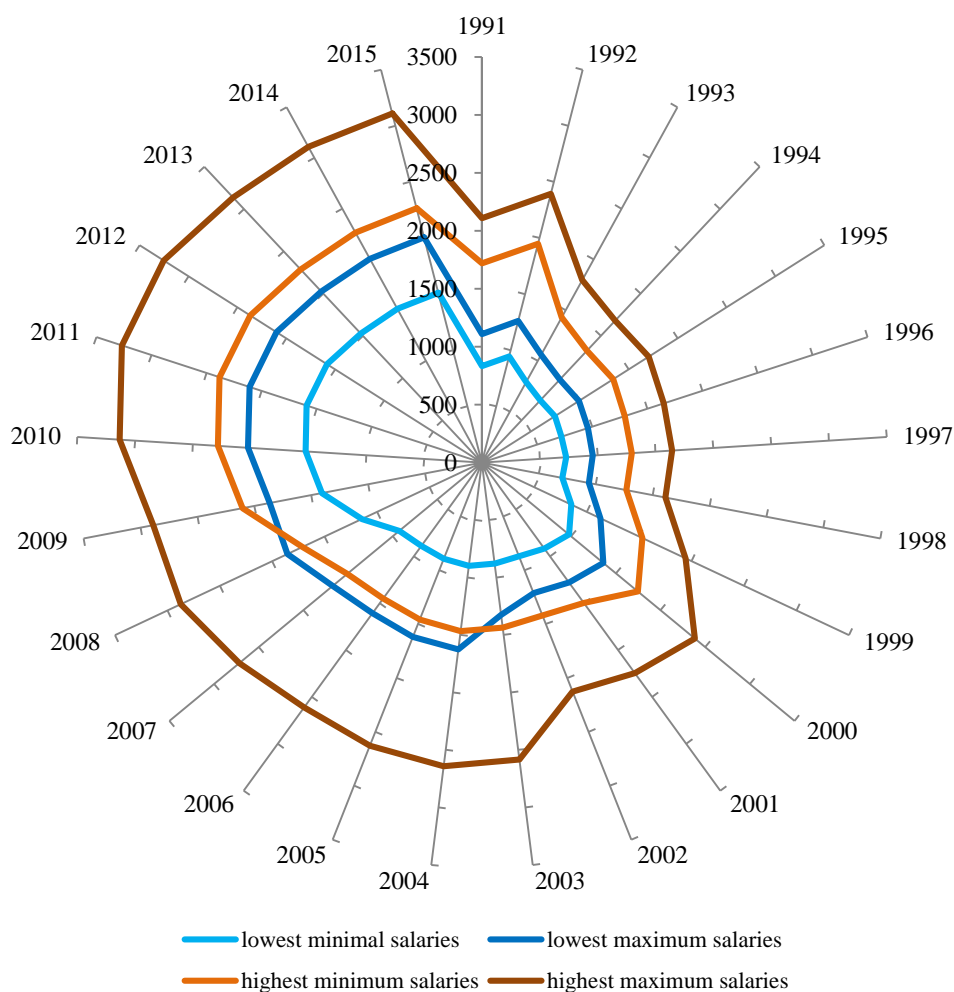
Thus in the first period the teacher could have the following types of education: 1) a scientific degree of PhD, 2) master's degree education with teaching preparation, 3) master's degree education without teaching preparation or master's vocational degree with teaching preparation, 4) master's vocational degree without teaching preparation or teaching college education, 5) secondary school, pedagogical education 6) secondary and other education.

The second stage offered only four levels of education: 1) scientific degree of PhD or associate professor, professional master's degree with teaching preparation, 2) professional master's degree without teaching preparation, professional bachelor's degree (engineer) with pedagogical preparation, 3) professional bachelor's degree (engineer) without pedagogical preparation, a diploma of completing education at teaching college, teaching college of foreign languages and 4) other qualifications.

The number of columns in the remuneration table was reduced from 15 to 4, while the number of rows was also limited from 6 (since 1993 – 5) to 4, which greatly simplified the system, but also polarized the teaching community. Not many teachers remember that in 1990 the salary of a teacher with other secondary education started with 371 thousand zloty and reached 456 thousand, while in the best-paid group of PhD degree holders, the remuneration ranged from 767 thousand zloty to 966 thousand. The zloty denomination conducted on 01<sup>st</sup> January 1994 made the above amounts (re-assessed each year) respectively PLN 1670 and PLN 2230 and PLN 3010 and PLN 3810.

In 1993 teachers with PhD degree were included in the group of teachers with master's degree education and teaching preparation, while the teachers' earnings in 1993 ranged from PLN 1 330 thousand (the lowest group and the shortest length of service in profession) to PLN 3020 thousand, thus officially teachers were millionaires (not counting other remuneration elements).

The teachers' remuneration, including the base pay, is subject to all economic and social processes, therefore it is sometimes difficult to compare particular years. To make such comparisons possible, we may apply at least three methods: measure the purchasing power of teachers' salaries, comparing them to the so-called basket of basic goods, convert current prices into the so-called fixed prices by selecting a base year, or relate the average remuneration to the average remuneration in Poland in particular years. In our considerations we will adopt the second method at first, with the base year – 2015, while the base pay of teachers from previous years (the lowest and the highest in the table resulting from the order and since 1997 – the regulation of the Minister, presented as minimum and maximum salaries), reflecting inflation, were converted into the level of this year's prices. The remunerations for 1991-1993 were 'denominated', dividing their nominal value by 10 000, as it was formally done on 1<sup>st</sup> January 1994. The graph below presents the results.



*Fixed prices = January 2015*

**Graph 1.** Real remuneration of teachers in 1991-2015 according to rates determined in the (order) regulation of the Minister, reflecting inflation and Polish currency denomination

It is worth noticing that after a period of relative salary growth in 1991 and 1992, the period of 1993-1998 brought their noticeable real decrease and they were maintained at quite a low level for five years. During that period inflation was suppressed from the rate of 70% in 1991 to 12% in 1998. This means that teachers' salaries increased at that period allowed them to avoid experiencing a dramatic worsening of their material status, but nevertheless, in 1998 they reached the lowest level over the period of eight years. Since 1999 the value of teachers' base pay was gradually increasing (until 2011), with base pay 'frozen' and inflation 'eating into' teachers' salaries.

Thus we can say that teachers still have a long way before stabilizing their salary growth, though it should be admitted that in the period from 1998 and 2011 their salaries grew on average by 107%, that is they doubled.

### 3. Teachers' Salaries

Salary is only part of teachers' remuneration. We could analyze the issue thoroughly, though probably our paper would turn into a long dissertation. For example: the pay regulation of the Minister of 1991 covered tens of various, more or less precisely determined additions for teachers. The most important groups covered: remuneration for overtime, functional additions, increased functional additions, as well as service and specialist additions, allowances for difficult and tiresome working conditions, for health hazards, working night shifts and remuneration for extra classes.

Together with the change of teachers' remuneration system in 2000, a clear distinction was made, dividing the teacher's revenue from employment into salary and social allowances. According to Article 30 section 1 of the Teachers' Chart, a teacher's remuneration is composed of the following elements: base pay (its amount depends on professional promotion degree, qualifications possessed and scope of obligatory clas-

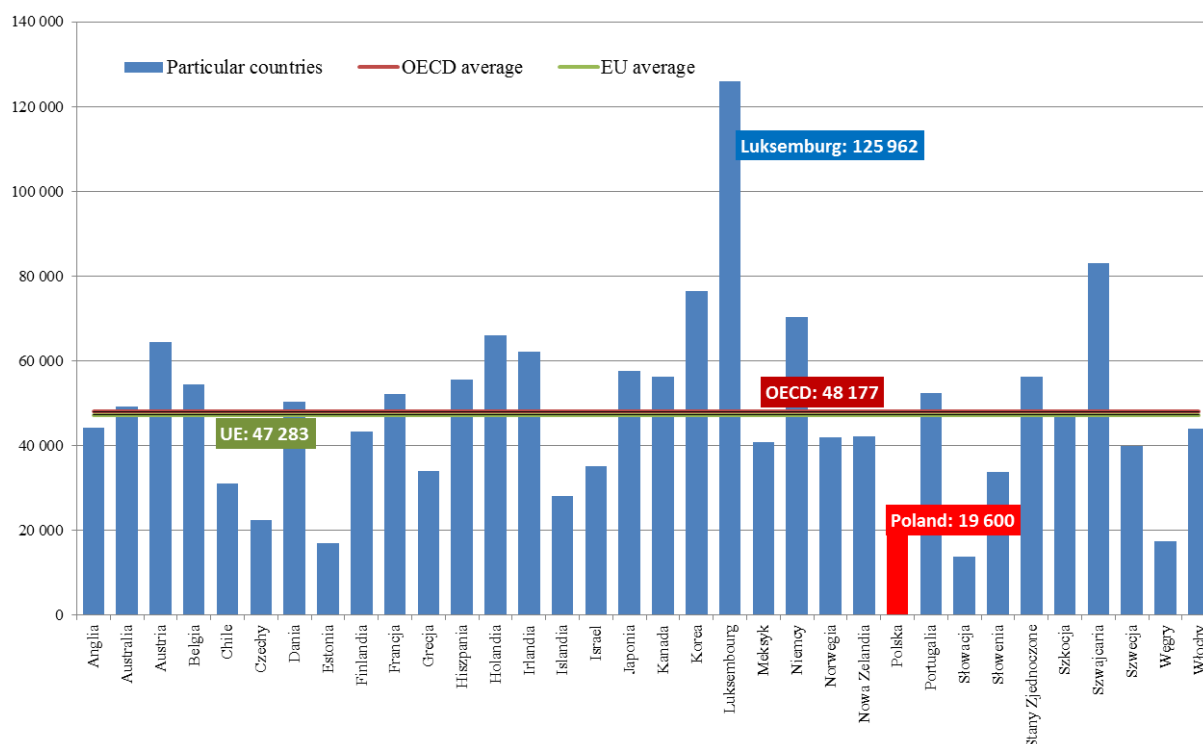
ses), additions (for years of service, motivational, functional, for working conditions), remuneration for overtime and substitutions and awards and other allowances resulting from employment, addition for tiresome work, additional remuneration for working night shifts, a jubilee award, additional annual remuneration, allowance for settling down, teacher's discharge money, awards from special award fund; in addition, a teacher who was granted an honorary title of Education Professor is entitled to receive a one-off financial award. The multitude of additions does not significantly affect (apart from the years of service addition) teachers' gross remuneration level.

While the minimum rates of base pay for teachers are determined by the Minister of Education in their regulation, the motivational, functional and working conditions allowances, including their amount and details of granting them, are determined in regulations implemented by local authorities being organs running schools. Local authorities also determine a detailed method of calculating remuneration for overtime classes.

The situation was further complicated when the Ministry of Education suggested that the provisions of the Teachers' Chart be made more precise by adopting Article 30a and 30b in December 2009. This time it was interpreted that the provisions of Article 30 section 3 of the Teachers' Chart, determining average salaries for teachers, were an unconditional privilege rather than an entitlement. Therefore a system of calculating and paying a one-off addition was introduced, the above addition being determined proportionally to the length of service and personal rate of base pay for a given teacher, allowing them to achieve average remuneration at particular stages of professional promotion in a given local government unit in a year for which the amount of the difference was calculated. This obligation is subject to supervision of regional accounting offices and must be reported, as stipulated by the regulation.

The above situation concerns annual settlements according to professional promotion degrees. We should also remember that according to Ministry of Education data, the average monthly remuneration of teachers was: in 2004 – PLN 2418, 2005 – PLN 2536, 2006 – PLN 2 658, 2007 – PLN 2 837, 2008 – PLN 3 142, 2009 – PLN 2 600, 2010 – PLN 2 750, 2011 – PLN 2942 and in 2012 – PLN 3 054.

The change of the remuneration system in 2000 and its adjustment in 2009 were only a continuation and adjustment to what was introduced into the teachers' room in 1982. However, on 01<sup>st</sup> May 2004, a global event, that is Poland's accession to the European Union structures made us perceive teachers' salaries from an international perspective. On one hand EU and OECD reports showed differences between the level of remunerating Polish teachers and their counterparts in other countries, on the other hand, frequent populist and demagogue approaches to the issue shown by some teaching communities led to a serious misunderstanding and inability to draw conclusions, for example concerning teachers' remunerations.



*Remuneration in USD, calculated into PPPs*

**Graph 2.** Annual maximum remunerations of teachers in lower secondary schools in 2011 in EU and OECD countries  
 Source: own elaboration on the basis of data from: *Education at a Glance 2013. OECD Indicators.*

The above graph (Graph 2) shows how much has to be done for Polish teachers so that they can catch up with their counterparts in more developed countries. The issue would look incredibly worrying if it was not for the understatement associated with the figures presented above. We need to remember that salaries in particular countries must be related to GDP in each country, but most of all, we need to take into account the purchasing power parity of the local currency (PPPs).

Poland is a unitary country, though by no means a small one. It is spatially varied, not only geographically, but also economically. In 2012, GDP per capita was nearly PLN 42 thousand, with four provinces generating GDP above the country average (Mazowieckie by 59%, Dolny Śląsk by 13%, Wielkopolska and Śląsk by 6%), while other provinces generated lower GDP. At the same time this potential has affected the state of regional economy, including domestic trade.

Central Statistical Office regularly publishes the so-called prices of the basket of basic food products (24 items). Since they are of different value in particular regions, it is worth using this simple tool to measure the purchasing power of teachers' salaries. For our analysis we adopted two assumptions: we took into account prices in January 2004 and 2015 (lower influence of seasonal effect on prices), thus the former relates to the times before Poland's accession to the European Union (low foreign trade due to customs barriers), while the latter is from January this year. And the second condition: we took into account the lowest and the highest base pay of trainee teachers (those who begin their teaching career) and diploma teachers (those with the highest salaries).

The analysis of the data included in Graph 2 allows us to make a few significant observations. The prices of particular products all over the country vary considerably, with their extremes between particular provinces reaching the average level of around 30%, with particular products ranging from 10% to 60%. It should be noted that the biggest number of maximum prices were in the following provinces: Mazowieckie, Pomorskie, Dolny Śląsk, Świętokrzyskie and Lubuskie, while the lowest prices dominated in: Podlaskie, Podkarpackie, Świętokrzyskie (also!) and Opolskie. And the above is only the analysis of the food product basket. In this situation holding to the assumption that all teachers should earn the same salaries in the whole country results in differentiated economic treatment of these teachers. I invite Readers to analyze the data in Graph 2 for themselves.

#### 4. School Principals

School principals are a specific group of teachers, since they are most of all recommended by the Act on Education System to take up such posts and they are beneficiaries of this provision. In 1991, in line with the then valid regulation of the Minister of National Education of 21<sup>st</sup> July 1989 on Teachers' Remuneration, teachers who were entrusted with managerial positions at schools were entitled to receive a functional allowance in the amount determined in the relevant table (attached to the regulation). The amount of the functional allowance was arbitrarily established by the organ supervising the school, which took into account the size of the school, its organizational conditions, complexity of tasks associated with the managerial function, the number of managerial positions in the school and the results achieved by the school.

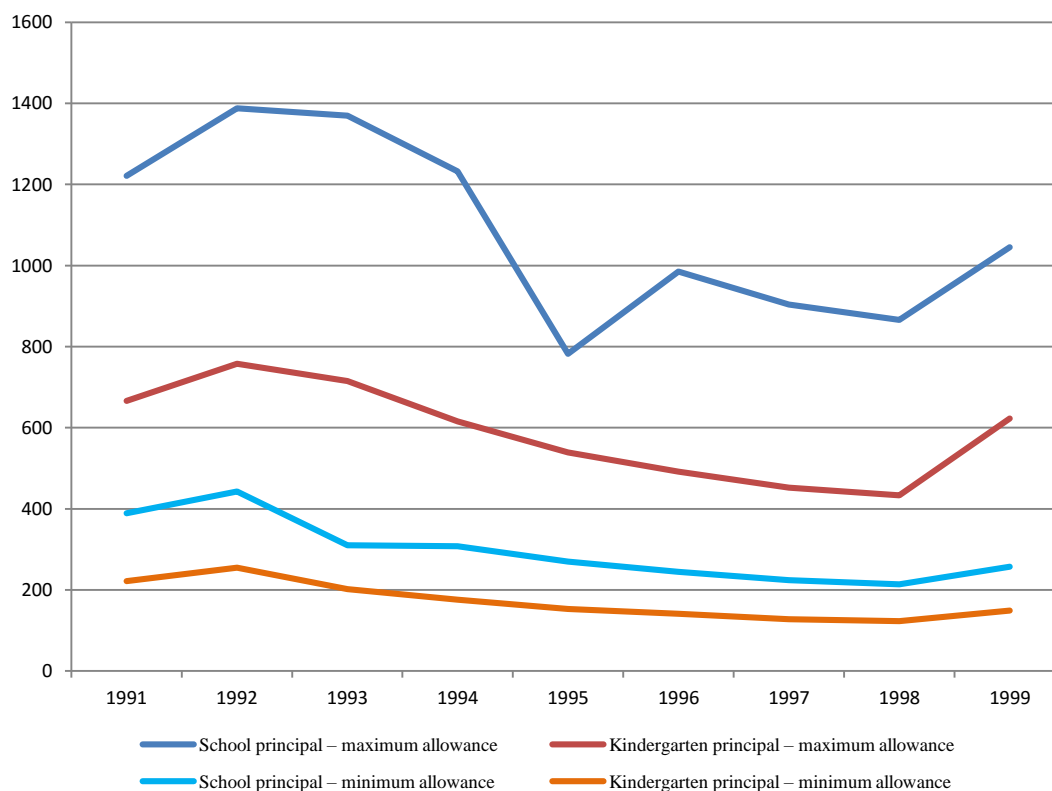
Allowances could be and were differentiated by a discretionary decision of a chief education officer, but they could also be – in line with the regulation – increased: from 15% for principals of boarding schools to 50% for principals managing two or more schools and heads of rehabilitation and diagnostic centers. It was also determined that in cases where there are several entitlements to increase the allowance, it could only be increased due to one entitlement.

What strikes us in legal acts of the first half of the 1990s is that according to the act on education system the school principal performed a function in this school. This changed when Polish law (including the Civil Code and the Penal Code) was revised and the term "function" was assigned to the activities performed at high levels of administration (public functionaries). Thus since 01<sup>st</sup> January 1996, Article 35 of the Teachers' Chart the term referring to principals who 'perform managerial functions' was replaced with a new term 'occupying managerial posts'. Since this amendment school principals left their functions for their posts, but ... the law-makers forgot to introduce relevant amendments to the Teachers' Chart, and so did the Minister in his pay regulations, therefore we still have the functional rather than the managerial allowance.

The graph presents only fragments of the tables related to functional allowances, showing only principals of kindergartens and schools within the minimum and maximum rates – the amount from 1991-1993 were calculated using the denomination ratio, whereas all amounts take into account inflation ratios, comparing them to the 2015 prices. A glance at the level of allowances from that decade shows that in real terms, the best level of functional allowances was achieved by kindergarten and school principals in 1992, with consecutive

years bringing some deterioration, and finally, just before passing the authority over allowances to local self-government, there was a slight improvement in rates.

As mentioned above, year 2000 saw a major adjustment of teachers' remuneration, which also included functional allowances. The new pay regulation contains a list of posts which entitle their holders to receive the functional allowance. Among the entitled people are teachers who were entrusted with the post of a principal or deputy principal of the school or another managerial post defined in the school statutes, class tutor or those who perform the function of a methodology advisor or a teacher-consultant and a trainee teacher's supervisor. Thus the functions returned to school, though in a different role.



*Fixed prices = January 2015*

**Graph 3.** Real functional allowances for school and kindergarten principals in 1991-2000, according to rates from the regulation of the Minister, taking into account inflation and Polish zloty denomination.

Source: own calculation based on "pay" orders and regulations of the Minister of National Education (and counterparts) in 1990-2000

Functional allowances after 2000 are not homogenous, as they depend on the decision of a running organ. As observed by Więśław (2012, pp. 49-60) „the average value (median) of the functional allowance received by the principal is PLN 800, while the first and the third quadriles are, respectively PLN 595 and PLN 1 119. An overwhelming majority of school principals receive this allowance in the amount between PLN 419 and PLN 1 500”. The above would mean that over the past 15 years functional allowances have not increased much, though territorial and environmental differentiation might be surprisingly varied.

## 5. Conclusion

The level of teachers' salaries and functional allowances have not turned this huge group of 43 thousand of employees (as of September 2014) into rich people. And although some local authorities (for example in capital city of Warsaw) show their appreciation of teachers' work by granting them special allowances, it seems that the problem lies elsewhere. Teachers' (and principals') remuneration should comprise a more significant element tying their salaries to the quality of performed work, since motivational allowance does not meet its objectives. The remuneration itself should reflect its local (or regional) purchasing power in order to be fair.

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