

## SOCIAL INDICES IN RISKS ESTIMATIONS OF FINANCIAL CRISIS: CASE OF TRANSITION ECONOMIES

## WSKAŹNIKI SOCJALNE W OCENIE RYZYK KRYZYSU FINANSOWEGO: PRZYPADEK GOSPODAREK PRZEJŚCIOWYCH

Osinkina Olena <sup>1</sup>, Podvysotskaya Tamara<sup>2</sup>,

(1) Analytical Centre “Bureau of Economic and Social Technologies”,  
01025, Kyiv, Ukraine

(2) National University of “Kyiv-Mohyla Academy”, Department of Finance,  
04070, Kyiv, Ukraine

e-mails: (1) [osinkina@gmail.com](mailto:osinkina@gmail.com) , (2) [tpodvysotskaya@gmail.com](mailto:tpodvysotskaya@gmail.com)

**Abstract.** *The main purpose of our research is to investigate the empirical evidence of global financial crises influence on social sector development. A specific question guiding the research was to find the most vulnerable aspects of social sector in transition economies countries and construct a complex social indicator which would allow to estimate the dynamics of social sector development in pre-crisis period and determine the appropriate policy measures to minimize the negative consequences in period of after-crisis recovering.*

*As we do not have an extended data for the period after crises, for now we are not able to do any credible conclusions for the post-crisis development of different aspects of social sector, but we can do cross-country comparison.*

**Keywords:** *social indices, global financial crises*

**Streszczenie:** *Głównym celem naszego studium jest zbadanie empirycznych dowodów wpływu globalnego kryzysu finansowego na rozwój sektora socjalnego. Specyficznym problemem, który kierował naszymi badaniami, było znalezienie najbardziej wrażliwych aspektów sektora socjalnego w krajach o gospodarce przejściowej i sformułowanie socjalnego wskaźnika, który pozwoliłby ocenić dynamikę rozwoju sektora socjalnego w okresie przedkryzysowym i określić odpowiednie środki polityczne dla zminimalizowania negatywnych konsekwencji w okresie pokryzysowego uzdrowienia sytuacji.*

*Ponieważ nie dysponujemy szerokimi danymi dla okresu po kryzysie, w chwili obecnej nie jesteśmy w stanie wyciągnąć żadnych wiarygodnych wniosków co do pokryzysowego rozwoju różnych aspektów sektora socjalnego; możemy natomiast dokonać porównań między krajami.*

**Słowa kluczowe:** *wskaźniki socjalne, światowy kryzys finansowy*

## **Introduction**

Experience of previous crises evidences that they have a strong negative effects on social indicators that on average are greater than the gains obtained during equivalent periods of economic growth (WB APEC, 2001).

During recent crises in Asia (1997–99), Latin America (1994–95, 1999) countries have experienced significant increases in the proportion of people in extreme poverty, deterioration of quality of life, loss of jobs and real income decrease, as well as deterioration of quality and the access to basic healthcare and education. These conditions tend to aggravate chronic social problems such as poverty, income inequality, deterioration of human capital, which even in the medium-run undermine the ability of a country for sustained economic growth (Cerda, 2009).

The main purpose of this research is to investigate the empirical evidence of global financial crises influence on social sector development. A specific question guiding the research is to find the most vulnerable aspects of social sector in transition economies countries and construct a complex social indicator which would allow to estimate the dynamics of social sector development in pre-crisis period and determine the appropriate policy measures to minimize the negative consequences in period of after-crisis recovering.

In our research paper based on the concept, proposed by Edstrom (1999) we assume that households were affected by the crises mostly by 4 sources (via financial market, product market, labour market and government services).

## **Data**

The data employed to analyze the state of social sector before and first stages after global financial crises is taken from World Development Indicators Database (WDI 2009). The data available allows to provide analysis only for the first stages of global financial crises and at that moment we won't be able to provide the extended analysis for the social sector development in after-crisis period.

For conducting an empirical estimation we constructed a panel of Ukraine and 22 more lower middle income and upper middle income European countries according to the World Bank classification, from which 15 are former CIS countries (Belarus, Moldova, Russia, Ukraine, Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan, Estonia, Latvia and Lithuania) and other 9 countries which

belonged to the socialist camp (Czech Republic, Slovakia, Poland, Hungary, Slovenia, Croatia, Albania, Bulgaria, Romania) for the period 2000-2009. Specifically for Ukraine Derzhkomstat (State Committee of Statistics) and the Ministry of Labour and Social Policy statistical yearbooks are very helpful source of information, and in spite of their reliability for some series is a bit questionable they can serve as a benchmark for double-checking.

### **Methodology**

Constructing of social index could lead to the multicollinearity problem and as a result future inconsistent OLS estimators. To control for this problem we applied Principle Component Analysis (PCA), that allows concurrently considering for different factors that proxy for four different aspects of social sector development and avoiding possible multicollinearity problem.

PCA is a non-parametric method of extracting relevant information from confusing datasets. In most cases it provides a roadmap for how to reduce a complex data set to a lower dimension one. The other advantage of the method is that it reduces the dimensionality of a data set while retaining maximum possible information. For calculating the Principle Components we applied the algorithm proposed by the statistical package STATA. 8.0.

### **Empirical estimated results**

Based on the PCA we constructed four social indices that could proxy for four factors that influence social sector during crises in different transition economies. Based on four previously estimated indexes we construct a complex social index. To make the estimated results more comprehensive the estimated output is scaled to the percentage equivalent, so that it would be possible to receive relative estimates.

On the basis of WDI database, to proxy first aspect – *financial market* we used such variables as adjusted net national savings (% of GNI), domestic credit provided by banking sector (% of GDP), legal rights of borrowers and lenders index (0= less credit access to 10 = more access), to construct a proxy for second aspect *product market factor* we used food imports (% of merchandise imports), travel services (% of commercial service imports), fuel imports (% of merchandise imports) and Internet users (per 1000 people). To model the proxy for the third aspect of social sector – *labour market factor* - we used the variables of long-term unemployment (% of total unemployment), unemployment with tertiary education (% of total unemployment), migration. The fourth aspect of social sector development –

*government services* was proxied by following variables: public spending on education (% of GDP), public health expenditures (% of GDP), out-of-pocket health expenditures (% of private expenditures). Combining these variables multi-factor complex index of social sector development was constructed. Applying the PCA method in STATA 8.0 finally we got the following linear combination of 4 different aspects that could characterize the state of social sector before and after global financial crises.

$$Social\_index = 0.572 i\_FM + 0.624PM + 0.352LMF - 0.721GS \quad (1)$$

where:

*FM* – estimation of constructed proxy for financial market influence on social sector development;

*PM* – estimation of constructed proxy for product market factor influence on social sector development;

*LMF* – estimation of constructed proxy for labor market factor influence on social sector development;

*GS* – estimation of constructed proxy for government sector influence on social sector development.

As constructed complex social index is quite difficult for economic interpretation, we turned it into the percentage scale, using the formula presented below.

$$Social\_index(\%) = \frac{Social\_index_{it} - \min(Social\_index)}{\max(Social\_index) - \min(Social\_index)} \quad (2)$$

Following the approach the higher social index the stronger is the stronger is the effect of four constructed proxies on social sector development.

As we do not have an extended data for the period after crises, for now we are not able to do any credible conclusions for the post-crisis development of different aspects of social sector, but we can do cross-country comparison.

Obtained estimated results do not demonstrate much difference in social consequences of crises in lower middle income and upper middle income transition economies of European region, which at that stage of research can be explained by the fact that social consequences demand for a longer time-lag to become more apparent. Such obtained results give the intuition on better understanding of instruments that influence different social aspects across different post-communist countries.

Construction of complex social index and quantitative estimation of the crises influence on social sector in transition economies is a novelty in the

methodology proposed by Edstorm (1999) for social consequences estimation and analysis.

The procedure applied does not allow us to make any conclusions concerning the model estimation. Still, we can see the intuition behind the idea of relationship between different aspects of social sector development.

### **Conclusion and policy implication**

The limits of the paper do not allow to convey the complexity of knowledge on the issues researched and can only provide a roadmap for policy and operational decisions.

Based on the results obtained we aim to contribute to placing the social agenda at a more central place in the work of governments of transition countries in European region. It is necessary for the governments to consider for the social sector as one of the policy priorities while crises, so that the determined policies leading to increased expenditures for social protection, education and health care will be in the long-run effective drivers for faster economic recovering. Another important issue is that social policies do not stand in isolation, in many aspects they are interrelated with economic policies. It is evident, that even good social policies are not able to prevent economic shocks, neither sound macroeconomic conditions nor economic growth can't be sustainable in the absence of sound social conditions. This fact becomes more evident in times of crises. As it was previously mentioned social factor has a multifaceted nature and itself can be influenced by different factors. This suggest a need for a complex approach from different policies based on structural reforms which at first step of implementation could be very unpopular among the majority of population, but could be implemented during crises. In case of transition countries further delay with structural reforming of inherited social sector can have a destructive effect not-only on the speed of post-crisis recovering but also on further productivity growth.

### **References**

1. Rose, Andrew K. and Spiegel Mark M. (2009) "*Cross-Country Causes And Consequences Of The 2008 Crisis:International Linkages And American Exposure*", NBER, WP 15358, 2009  
[http://www.nber.org/papers/w15358.pdf?new\\_window=1](http://www.nber.org/papers/w15358.pdf?new_window=1)
2. Edstrom, Judith et al. (1999) "*Managing the Social Consequences of Economic Crises*", WP prepared by World Bank Staff for the IMF-World

- Bank Annual Meetings. The full paper is available at <http://www.worldbank.org/poverty/library/index.htm>
3. Social Safety Nets in Response to Crises (2001), WB Working paper in collaboration with APEC member countries.  
<http://www.iadb.org/sds/doc/apecreport.pdf>
  4. Cerdo. Rodrigo (2003) “*Social Security Financial Crises*”, IDEAS,  
<http://ideas.repec.org/p/ioe/doctra/252.html>
  5. *Impact of the global crisis on neighboring countries of the EU (2009)* – Occasional papers, # 48, European Commission Directorate-General for Economic and Financial Affairs Publications, Brussels, Belgium,  
<http://www.odi.org.uk/resources/download/2462.pdf>



**Olena Osinkina** Analytical Centre “Bureau of Economic and Social Technologies” PhD (Candidate of Economic Sciences), Professor, Senior Economist

Address: Desyatynna 3-a, Kyiv, 01025, Ukraine

E-mail: [osinkina@gmail.com](mailto:osinkina@gmail.com)



**Tamara Podvysotskaya** National University "Kyiv-Mohyla Academy" (NaUKMA) PhD Candidate of Economic Sciences

Address: Voloska 10, office 410, 04070 Kyiv, Ukraine

E-mail: [tkonoreva@eerc.kiev.ua](mailto:tkonoreva@eerc.kiev.ua), [tpodvysotskaya@gmail.com](mailto:tpodvysotskaya@gmail.com)