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PAPER

Evaluation of Pass-Through Effect of the Exchange Rate to Inflation

Lida A. Mnatsakanyan

Abstract Monetary policy has a significant impact on economic growth. Exchange rate changes have a strong effect on relative prices of goods and services. The importance of the influence of the exchange rate on inflation can't be overstated and that is causes the monetary authorities to monitor the behavior of both nominal and real exchange rates to take an active interest in determining the behavior of the exchange rate. One of the key dilemmas of modern monetary policy is the issue of currency regulation. The performed analysis will show whether there is a correlation between exchange rate and inflation and will also identify the extent of this dependence in both developed and developing countries.

Keywords Monetary policy– Inflation- Exchange rate – Central banks

JEL classification E31 - E52

The choice of the exchange rate regime has a significant impact on the trade of goods and services, capital flows, inflation, balance of payments and other macroeconomic indicators. That is why the choice of the appropriate exchange rate regime is the main instrument of monetary policy in maintaining economic growth and stability. However, there is no consensus on how to choose a suitable exchange rate regime, and there is no single regime that would fit all countries. The characteristics of a particular country, the preferences of national governments, the institutional environment and trust can have influence on the choice of the exchange rate regime. The most important factors are the size and openness of countries to trade and financial flows, the degree of economic and financial development, trade and production structure.

Exchange-rate regimes can be roughly divided into three categories: fixed, flexible and intermediate. Until the 1970s, most countries adhered to a fixed exchange rate regime known as Bretton Woods system. Due to this system, countries used to fix their exchange rates against the US dollar, and the dollar was fixed against gold. All participating currencies were implicitly tied to gold. This system has existed for 25 years (1946-1971), but it still remains the preferred mode in many countries. The basic motivation for keeping exchange rates is the

Lida A. Mnatsakanyan (✉)
Russian-Armenian University, Yerevan, Armenia
e-mail: mnatsakanyan.lida@gmail.com

belief that a stable exchange rate can facilitate trade and investment flows between countries by reducing fluctuations in relative prices and by reducing uncertainty. Since 1971 the economy of many countries is moving towards flexible exchange rate regimes where the currency value is determined by market.

Taking into account the influence of exchange rate regimes on economic activity, the selection of the appropriate mode should be based on the pros and cons of each option regimes and basic economic fundamentals. Each of these modes has advantages and disadvantages. Floating regimes are more appropriate for developed countries, while intermediate regimes are the best options for developing countries with open economies and a developed financial sector. In the case of less integrated countries in the world economy and the lack of monetary independence, the soft modes of binding are preferable. Hard modes of binding, as a rule, is an option for countries with high inflation and a low confidence level.

In international practice, countries use either fixed or floating exchange rates. Until 1973 almost 75% of all countries used fixed exchange rates, since 1973. – floating exchange rates.
The fixed exchange rate is established by the government or the Central Bank of the country. The course is governed by the instruments of currency regulation, however, the ratio of market fluctuations between the national currency and the foreign currency does not change. Basically small countries with open economies that depend on exports, pass to the fixed exchange rate. Thus, they provide a stability of export and import prices, which makes the development of foreign trade more predictable. A fixed rate is preferable for those countries which are at the same level of development and implement trade among themselves. This system was popular until the Bretton Woods monetary system. It promotes commerce and stimulates the inflow of capital increases the financial credibility of monetary policy.
Despite the advantages, a fixed exchange rate has the following disadvantages:

- due to the fact that the policy is strongly related to monetary interventions, the Central Bank should either buy the domestic currency to lock exchange rates, which will reduce the lending of commercial banks, and leads to economic decline as a result, or to buy foreign currency, thereby increase the need to issue the national currency, which, in its turn, leads to a growth of the inflation rate and economic recession.
- if the export market has suffered losses, and the country has gold reserves in sufficient quantity to maintain a fixed exchange rate, it won`t be able to withstand economic shocks. In this case, domestic prices fall, production stops and the number of unemployed people increases;
- the government practically does not manipulate the exchange rate (the possibility of manipulation reduces);
- "the risk of exchange rate in trade reduces, since transactions conducted in one currency is favorable for a large trade partner;
- the fluctuation of one currency determines the fluctuation of domestic currency against all functional"[1] .

The floating exchange rate is formed on the basis of supply and demand, and only in the case when it is necessary, is corrected by the state. This mode is effectively used, if the production country is not in high correlation with the outside world. A floating exchange rate reduces inflation by the accurate prediction of money demand, which should exceed or be equal to the proposal from the Central Bank. But as many factors are unforeseeable and unpredictable, it is rarely possible to predict demand accurately. A floating exchange rate supports the competitiveness and adapts to external economic shocks. If the foreign exchange market works effectively, then speculators

1 Madiyarova D. M. (1999), «Strategy of foreign economic activity», Almaty

won`t be able to capitalize on the profits of the Central Bank.
The disadvantages of a floating exchange rate include the following cases:

- "if the foreign exchange market is characterized by low capacity, a few large transactions can undermine the existing situation;
- conditions of uncertainty reduce the attractiveness of the market to foreign investors and trading partners by the conditions of uncertainty under the current regime;
- the threat of government manipulation undermines the confidence of market participants.
- in the presence of large speculative capital flows, the exchange rate largely constrains monetary independence."

The transition to a floating rate regime can be effective in the presence of a developed financial market, its integration with the world system, the interchangeability of domestic and foreign monetary assets and development degree of financial intermediation. Despite these requirements, many underdeveloped countries have switched to this system. The consequence was that the appearance of a mixed exchange rate, which has combined elements of fixed and floating exchange rates. It is possible to include all the pros and cons of floating and fixed exchange rates that will occur with less force and it is easier to handle.

Examples of mixed exchange rate are:

- Creeping binding. A corridor for the exchange rate is set and when you change certain parameters (the difference between the growth rate of the national economy and partner countries inflation, the difference between expected and actual inflation rates in partner countries) is adjusted. The containment of the exchange rate within a certain corridor restricts currency regulation.
- A fixed exchange rate with horizontal binding. The exchange rate may fluctuate within ±1% from a fixed exchange rate
- A fixed exchange rate with creeping the horizon. The rate fluctuates within ±1% from a fixed exchange rate with periodic adjustments of the exchange rate. The difference between the minimum and maximum exchange rate should not exceed 2%. The value of the fixed exchange rate is adjusted periodically, depending on changes to the pre-defined indicators. Sloping corridor may have trailing or leading character as possible in the event of creeping of the anchor. Commitment of maintaining the exchange rate within the band imposes constraints on monetary policy. Exchange rate flexibility depends on the width of the currency band. The oscillations range can be symmetrical relative to the Central parity or gradually widen from time".
- Managed floating exchange rate with no pre-established horizon of the exchange rate. No corridors are established. Monetary authorities try to control the fluctuations of the exchange rate near long-term trend. To adjust the exchange rate, such factors as balance of payments, foreign exchange reserves, the level of development of neighboring countries are used.

The exchange rate allows you to calculate the volume of international investments in the national currency and the price of foreign trade. It also improves the competitiveness of countries and reflects the direction of change of the balance of payments of the country. However, taking into account the fact that the exchange rate is the monetary measure, first of all it informs the market about the existing measures of monetary policy.

Regarding the choice of exchange rate regime over the past 40 years economists have developed various theories. In early literature, based on the work on optimal currency areas by Mundell (1961), McKinnon (1963), and Kenen (1969), the foundations associated with abilities to cope with the shocks of demand and the effectiveness of monetary policy to manage aggregate

demand are emphasized. Subsequent authors, according to William Poole (1970) wrote about the analysis of monetary policy instruments aimed at the type and source of the dominant shocks faced by the economy. Drawing on the work of Barro and Gordon's (1983) reliability of monetary policy, the 1980s has developed the idea that the binding of the exchange rate can contribute to the credibility of a policy of low inflation, foreign Central Bank (Francesco Giavazzi&Giovannini Alberto (1989) Fratianni and von Hagen (1991)). More recent literature, finally, notes that the currency crises of the 1990s (Mexico, Southeast Asia, Russia, Brazil and Argentina) include the combination of some forms of fixed exchange rates with high capital mobility. This suggests that countries that are in contact with large flows of capital, must avoid unstable exchange rate regimes and for this there are two solutions: a very rigid binding of currencies (such as currency Board or dollarization) or a flexible mode[2] .

The collapse of the Bretton Woods system in the early 1970s paved the way for a more diversified choice of exchange rate regimes and facilitated the analysis of the necessity of choosing one or another mode in the empirical literature. Early empirical literature also considers the foundations and approaches then gives some recommendations regarding the choice of modes (Heller (1978) and Dreyer (1978)). More recent studies introduced considerations of optimal macroeconomic stabilization, adding power to various types of shocks (Melvin (1985) and Savvide (1990, 1993)). These authors consider that the presence of fixed nominal shocks increases the likelihood that the anchor currency, while real shocks reduce it. Empirical studies of the 1990s considering the impact of political and institutional variables on the choice of mode and coming to the conclusion that political instability increases the likelihood of the introduction of flexible exchange rate regimes (Edwards (1996) and Berger and others (2000)).

Member countries of the International Monetary Fund (IMF) report their exchange-rate regimes which in turn annually publishes these data. Until 1999 these countries have announced one of three possible modes: hard binding (pegged arrangements), flexible binding (flexible arrangements), and freely floating regime (free float). This rough classification was refined in 1999, responding to an observation about a significant degree of variation in the official descriptions of policies, classified as “bound” or “more flexible”. Regarding the classification of exchange rate regimes, the IMF (1999) allows to divide them into eight different categories ranging from the adoption of foreign currency as legal tender and ending the regime of free floating.

There are three groups of factors influencing the choice of exchange rate regime of a country: economic base, variables related to macroeconomic stabilization and the variables associated with the risk of currency crises. The work of Mundell (1961), McKinnon (1963) indicates the degree of economic openness as important fundamentals. They argue that small and open economies are more likely to adopt fixed exchange-rate regimes than large and relatively closed economy[3]. In addition, the country is likely to adopt a fixed exchange rate regime if its trade is heavily concentrated in a particular currency area. Furthermore, Kenen (1969) shows that countries with very concentrated production structures are more likely to adopt flexible exchange rates than countries with highly diversified production, as exchange rate fluctuations,

2 Eichengreen, Barry, (1994), International Monetary Arrangements for the 21st Century(Washington DC: Brookings Institution); Obstfeld, Maurice, and Kenneth Rogoff, (1995), „The Mirage of Fixed Exchange Rates, “Journal of Economic Perspectives, Vol. 9, No. 4, pp.73.; and Fischer, Stanley, (2001), „Exchange Rate Regimes: Is the Bipolar View Correct?“ IMF.

3 McKinnon, Ronald (1963), „Optimum Currency Areas,“ American Economic Review 53 (September): 717-725; Mundell, Robert, (1961), „A Theory of Optimal Currency Areas,“ American EconomicReview51 (September): 657-665.

practically equivalent to the change in relative product prices, and therefore more useful to combat demand shocks[4]. The last consideration is the development of the financial sector of the country. Countries with relatively underdeveloped financial sector often choose the regimes of fixed exchange rate, as they lack the market instruments to conduct domestic open market operations and they need to protect their fledgling banking industry in the presence of significant fluctuations in the exchange rate. Thus, low financial development increases the probability of adopting fixed exchange rate regimes. Henderson (1979), McKinnon (1981), and Boyer (1978) argue that fixed exchange rates work best from the point of view of the absence of stability, that is, the presence of monetary shocks occurring in the economy, while flexible rates perform better in the presence of real shocks[5]. After Barro and Gordon (1983), many authors have argued that countries whose monetary authorities suffer from low credibility of the Central Bank, can increase Central Bank credibility by adopting a fixed exchange rate regime with a more stable currency (Fratianni and Von Hagen (1992), Francesco Giavazzi&Giovannini Alberto (1989), and Daniel &Melitz)[6]. This opinion is important in the transition from a socialist economy to a market economy, when price liberalization and the elimination of the monetary overhang leads to high inflation.

Originally for macroeconomic stabilization, a fixed exchange rate can provide a nominal anchor for domestic prices in a situation where there are no reliable monetary policy institutions. Even for transition countries that started transition with more moderate inflation, "Washington consensus" in the early 1990s decided that the exchange rate is the appropriate nominal anchor provided that fiscal policy is sustainable (Begg (1998) and Bruno (1991, 1993))[7].

In recent years the General trend full or large capital mobility has shifted attention on the implications of capital movements on the basis of the choice of exchange rate regimes. The regimes of fixed exchange rate combined with a high degree of capital mobility is exposed to speculative attacks as a result of policy inconsistencies (Krugman (1979), Salant and Henderson (1978)), or lead to expectations that arise in the context of multiple equilibria (Obstfeld (1996))[8]. The point is that countries should avoid unstable combinations of capital mobility and rigidity of exchange rates. Important factors that reduce the risk of speculative attacks are the availability of foreign exchange reserves to protect a fixed exchange rate, and the coherence of macroeconomic policies. The sustainability of public finances is a key factor in this regard.

There are many factors that affect the exchange rate of the country and which can have both positive and negative impacts on economic growth of the country.

4 Kenen, Peter B.(1969), „The Theory of Optimum Currency Areas: An Eclectic View," in Robert Mundell and Alexander Swoboda, eds., Monetary Problems of the International Economy (Chicago: University of Chicago Press).

5 Boyer R., (1978), „Optimal Foreign Exchange Market Intervention," Journal of Political Economy: 1045; Henderson D., (1979), „Financial Policies in Open Economies," American Economic Review 69(2); McKinnon, R., (1981), „The Exchange Rate and Macroeconomic Policy: Changing Postwar Perceptions," Journal of Economic Literature 19(2): 531.

6 Melitz, Jacques, (1988), „Monetary Discipline and Cooperation in the ERM: A Synthesis," in F. Giavazzi, S. Micossi, and M. Miller eds., The European Monetary System (Cambridge: Cambridge University Press).

7 Begg, David, 1998, „Disinflation in Central and Eastern Europe: The Experience to Date," in Carlo Cottarelli and GyörgySzapary eds., Moderate Inflation: The Experience of the Transition Economies (Washington DC: IMF).

8 Obstfeld, Maurice, 1996, „Models of Currency Crises with Self-fulfilling Features,"European Economic Review 40 (April): 1037

The main ones should be noted:

- the inflation rate.
- the payments balance.
- the difference in interest rates on the attracted capital in different countries.
- the degree of trust to the country in the global society.
- competitive product.
- national income of the country.
- higher domestic prices.
- increase interest rates to attract foreign capital.
- the degree of development of the securities market.

Pass-Through Effect of the Exchange Rate

Traditional Economics considers that the purpose of devaluation is to make imports more expensive and exports cheaper, and that if the devaluation was effective, domestic prices should remain unchanged. The situation, when the devaluation of the national currency affects the domestic prices and relations with any other country, such a measure will undoubtedly be compounded, as each subsequent devaluation will not create your own price spiral, while the initial effect is neutralized. However, in this case, the domestic production does not increase sufficiently to meet the additional demand caused by the devaluation.

Oyejide said that the devaluation of the exchange rate often leads to increased costs in local currency of imported inputs (raw materials and intermediate goods capital use) and end-products through cost inflation. He noted that non-traded goods cannot be imported, because the excess demand will increase prices in the domestic market in the short term[9].

Omotor considered the impact of the price change exchange rate in Nigeria using annual data in the period 1970-2003. The evidence suggests that exchange rate policy plays a significant role in determining inflation in Nigeria[10]. Other studies that have similar findings - Odedokun, Odusola and Akinlo, Nnanna, and Zhang Lu. Having considered the available evidence, we were able to install the main impact of exchange rate on inflation in the country, although there are other variables such as money supply, government expenditure and others.

It is important that prior to adaptation mechanisms of the market system, the main objective of monetary policy impact on exchange rates, which could affect real economic variables in the economy and reduce inflation. Consequently, the policy of progressive appreciation was conducted for the period of the oil boom that occurred in the same period. The sudden transition to a market economy provoked the practice of using the floating exchange rate, especially among Western countries[11]. The international Monetary Fund approved the selection of a floating exchange rate regime. Therefore it was made part of the policy of restructuring the external debt[12]. In addition, Japan, the USA and other countries of Western Europe used it to solve the problem of overcapacity and to achieve equilibrium of the balance of payments[13].

9 Oyejide T.A.,(1989). Thoughts on Stability of Nigeria's Exchange Rate. The Nigerian Banker, September –December.

10 OmotorG.D., (2008). Exchange Rate Reform and its Inflationary Consequences: The Case of Nigeria. EconomskiPregled, 59 (11): 688-716

11 Bannerjee A.D., Mestre R, (1998). Error Correction Mechanism Tests for Co integration in Single Equation Framework. Journal of Time Series Analysis, 19: 207–283

12 Canetti E., Greene J., (1991). Monetary Growth and Exchange Rate Depreciations as Causes of Inflation in African Countries: An Empirical Analysis. Mimeo, IMF, Washington.

13 Shanks M., (1973)."The Quest for Growth. London & Basingstoke: The Macmillan Press Ltd.

To link the exchange rate and price dynamics serve as other indicators. These are the so-called real exchange rate, real effective exchange rate and exchange rate on purchasing power parity (PPP). The real exchange rate characterizes a change in the price level in one country compared with the price level of another, measured using the nominal exchange rate. Inflation is objectively one of the fatal characteristics of a capitalist economy. It can be more or less, take the form of a depressed or open, but it is present in the economy of all countries for many decades.

Over the past twenty years there has been a decline in the number of countries using fixed exchange rate as a formal anchor for monetary policy. In 1979, 68% of member countries of the IMF have used a fixed exchange rate policy, while the number in 1997 had dropped to 36%. Including in countries with limited floating exchange rate, the corresponding figures dropped from 76% to 44% (IMF, 1999). However, the official regimes only tell part of the story. The actual conduct of monetary policy is subject to change without reflect changes in the organization of monetary policy. Taken into account the number of countries de facto applying the fixed exchange rate as an anchor for its monetary policy, it appears that fixed exchange rates in one form or another remained an important anchor of monetary policy of countries in the world.

Almost 60% of countries have adopted a fixed regime policy, while fixed exchange rate is used as the formal objectives of monetary policy in only 45% of them[14]. However, the number of countries using a fixed exchange rate, fell. In 1991, 76% had a fixed exchange rate as their main instrument of monetary policy, but the figure had fallen to 60 per cent (IMF, 1999 and International Financial Statistics, August 1999).

According to Goldberg and Knetter (1997) the effect of the exchange rate is defined as "the degree of sensitivity of the price of import goods on a one per cent change in national exchange rate is called the effect of exchange rate transfer to prices".

However, the change in the price of imported goods to some extent also influences production and consumer prices. For this reason, in this work the influence of carry-over effect of the exchange rate is considered in a broader sense, as the changes in consumer prices can be linked to previous changes in the nominal exchange rate.

Inflation and Pass-through Effect of the Exchange Rate

To assess the impact of the devaluation on domestic prices, we use the technique of VAR analysis, proposed by McCarthy in 2000. Existing studies usually use a single equation in the evaluation of the effect of the exchange rate to explain the reaction of the index of domestic prices to exchange rate changes (for example, Olivei (2002); Campa and Goldberg (2005); Campa, Goldberg and González-Mínguez (2005); and Otani, Shiratsuka and Shirota (2005)). The effect of the exchange rate implies a causal direction from exchange rate to domestic variables, which may be most pronounced in the period of the currency crisis. However, the inverse causal relationship of domestic prices to the exchange rate cannot be ignored. For example, as suggested by a standard monetary model, an increase in domestic prices most likely leads to the depreciation of the exchange rate.

It is more appropriate to use a model in which the exchange rate and domestic price inflation are treated as endogenous variables. In addition, domestic macroeconomic variables are likely to affect the exchange rate, especially in the floating exchange rate regime. The VAR approach is useful to ensure the endogenous interactions between the exchange rate and other macroeconomic variables, including domestic prices. McCarthy (2000), Hahn (2003) and Faruqee (2006) used a vector autoregression (VAR) to evaluate the effect of the exchange rate in developed countries,

14 Thórarinn G. Pétursson(2000)"Exchange rate or inflation targeting in monetary policy", Monetary Bulletin

especially in the Eurozone. Ito and Sato (2006) also applied the VAR analysis to evaluate the effect of exchange rate in East Asian countries, while Belaish (2003) used a VAR for Brazil, Leigh and Rossi (2002) for Turkey.

Following the methodology of Ito and Sato (2006), we use the VAR model with 7 variables

$$X_t=(\Delta oil_t, \Delta gap_t,\Delta m_t,\Delta neer_t,\Delta imp_t,\Delta ppi_t,\Delta cpi_t)'$$

where

oil$_t$- the natural logarithm of oil prices,
gap$_t$- the gap between actual and potential output,
m$_t$ - the natural logarithm of the money supply (monetary base or M1)
neer$_t$– the nominal effective exchange rate,
imp$_t$–the import price index,
ppi$_t$–the producer price index,
cpi$_t$–the consumer price index
Δ –the operator of first difference

World oil price is an average of the three indices of spot prices: Texas, Brent and Dubai Crude expressed in US dollars. The gap between actual and potential output, is calculated by applying the HP filter to estimate a strong trend in the index of industrial production. All data except the nominal effective exchange rate, are calculated from the seasonally adjusted using the method CensusX-12. The main objective of this study is to assess the impact of the exchange rate and other macroeconomic shocks on domestic prices, as well as other possible interactions between them. To generate the structural shocks, we use the decomposition of Kholetskova matrix Ω, the variance-covariance matrix with the VAR remains. The relation between the residues of VAR (u_t) and structural deviations (ε_t) can be written as follows:

$$\begin{pmatrix} u_t^{oil} \\ u_t^{gap} \\ u_t^{m} \\ u_t^{neer} \\ u_t^{imp} \\ u_t^{ppi} \\ u_t^{cpi} \end{pmatrix} = \begin{pmatrix} S_{11} & 0 & 0 & 0 & 0 & 0 & 0 \\ S_{21} & S_{22} & 0 & 0 & 0 & 0 & 0 \\ S_{31} & S_{32} & S_{33} & 0 & 0 & 0 & 0 \\ S_{41} & S_{42} & S_{43} & S_{44} & 0 & 0 & 0 \\ S_{51} & S_{52} & S_{53} & S_{54} & S_{55} & 0 & 0 \\ S_{61} & S_{62} & S_{63} & S_{64} & S_{65} & S_{66} & 0 \\ S_{71} & S_{72} & S_{73} & S_{74} & S_{75} & S_{76} & S_{77} \end{pmatrix} \begin{pmatrix} \varepsilon_t^{oil} \\ \varepsilon_t^{gap} \\ \varepsilon_t^{m} \\ \varepsilon_t^{neer} \\ \varepsilon_t^{imp} \\ \varepsilon_t^{ppi} \\ \varepsilon_t^{cpi} \end{pmatrix}$$

εt^{oil}-shock in oil prices (supply shocks);
εt^{gap} - the shock to the GDP gap (the demand shock);
εt^{m} – the monetary shock;
εt^{neer} - the shock of the nominal effective exchange rate;
εt^{cpi} ,εt^{imp} , εt^{ppi} – price shocks.

The structural model is identified because the k* (k -1) / 2 restrictions on the matrix S as zero restrictions where k denotes the number of endogenous variables. The result is a lower triangular matrix S implies that some structural shocks do not have a simultaneous effect on some endogenous variables.

Some features of the model and assessment methodology

- First, the order of endogenous variables must be defined carefully to identify structural shocks. The change in oil prices is included to identify the supply shock and is at the beginning of the VAR model. In the remains of the prices for oil it is hardly affected simultaneously by any other shocks except the supply shock (oil prices), while the supply shock is likely to affect all the other variables in the system simultaneously. The shock of the production gap ranks second in the ordering of the VAR model. The shocks of supply and demand that affect the production gap is expected, mostly predefined. There are lags from the exchange rate, monetary policy and price changes in discontinuities of GDP. Thus, it seems reasonable that the gap in production simultaneously is affected only by the oil price shock and the production gap.
- Money supply, i.e. monetary base or M1, included in the VAR to account for the influence of monetary policy in response to large scale or rate of devaluation. Money supply is ranked third in the ordering of the VAR model before NEER and price variables have the following sequence: the price index for imported goods, because they are the first affected by shocks; followed by the producer price index, which are the second point of impact; and in the end the impact of shocks is displayed on the applicants of the consumer price index.

The literature that studies the effect of the transfer of course, usually raises domestic prices in the lower part of the VAR, so that the variable "price" at the same time is influenced by all other shocks while the price shock has simultaneous impacts on other variables. However, it is not clear whether it would be appropriate to put the money indicator before the indicator of the nominal effective exchange rate. Kim and Roubini (2000), Kim and Ying (2007) propose to place the course in the lower part of the VAR. Indeed, while the exchange rate is considered as a promising asset, it is reasonable to assume that the exchange rate tends to respond pretty quickly and simultaneously to macroeconomic shocks.

As noted above, however, in most studies investigating the effect of the exchange rate, domestic prices are the last in the VAR model. Accordingly, the money supply stands in front of NEER according to Kim and Roubini (2000), but internal prices, in contrast of course, are in the lower part in accordance with the literature that studies the effect of the transfer of course.

Empirical results and conclusions

Obtained as a result of the analysis based on the selected and the above methodology are presented in Annex 1. This shows the infusion of several key macroeconomic indicators in the selected price indexes. In addition, it also considers the mutual influence among the main indicators of price changes.

For determining the levels of dependency and importance in the table are presented the values of the influence coefficients, the values of the probability (to establish the significance of the indicator), and also the separate values of R square for each regression equation are presented to show how this equation is correct the relationship of the selected regressors and the dependent variable.

For all used time series test was performed Dickey-fuller test for unit root to check the stationary of time series and their integration.

As a result of analysis we obtained the following results:

- The model describes the influence of the macroeconomic indicators used in the formation of prices in the more developed countries where market factors dominate pricing. This

result is clearly visible, if we consider the values R^2: for example, in the USA, the UK, Switzerland, Germany, etc. the indicator R^2 ≥ 0.70. With regard to developing countries, such as Brazil, Russia, China, India, etc., this ratio varies from 0.5 to 0.7. However, in the countries in transition the value of R^2 ranges from 0.01 to 0.04 (0.06 in some cases). The lowest result for this indicator was registered in Armenia, which is the basis for the assumption that the formation of prices in the country occurs under the influence of non-market mechanisms.

- Checking the reliability of our model for each country under consideration, let us consider the following two indicators which are worth paying attention to, there are the influence coefficient of each of the chosen indicators on dependent variables and the probability values to establish the significance of the obtained coefficients. Examining the data from the table we can conclude that in developed countries the level of consumer prices affect oil prices or import prices or prices, which in its turn also depend on oil prices (USA, UK, Canada, Singapore, Switzerland, etc.). In developing countries a more significant impact is the index of the nominal effective exchange rate, and in countries which are oil exporters the factor of world prices for oil also affects (Russia, Turkey, Mexico, etc.). Finally, in the case of countries with economies in transition (despite the low indicator R^2) the indicators of money supply has major influence (M1) and to some extent nominal real exchange rate (Armenia, Georgia, Moldova, etc.).

Taking into account the results obtained by us after conducting regression analysis of VAR, we can draw conclusions about the extent to which the relationship between exchange rate changes and inflation in countries applying a specific exchange rate regime. In countries with economies in transition, including Armenia (in spite of the low rate R^2) indicators of money supply provide a great influence on the formation of prices (M1), and, to some extent, the nominal and real exchange rates. In particular, it should be noted that this situation is typical for countries inclined to use fixed exchange rate.

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APPENDIX 1 – The relationship of the exchange rate and inflation

		Oil price	Output gap	M1 (Money base)	NEER	Import price	PPI	CPI	R^2
Armenia									
2007Q2-2015Q4	Import price	0.094387 (0.4078)	0.119853 (0.3502)	– 0.178803 (0.5314)	– 0.235142 (0.3951)	1	0.211209 (0.3971)	– 0.180184 (0.8392)	0.040707
	PPI	0.042514 (0.3553)	0.0570720 (0.3553)	–0.208056 (0.0863)	– 0.393463 (0.0006)	0.038636 (0.3971)	1	0.258591 (0.4955)	0.165213
	CPI	– 0.008912 (0.5164)	0.008912 (0.7479)	0.04975 (0.0462)	0.067868 (0.4630)	– 0.000261 (0.8392)	– 0.020479 (0.4955)	1	0.063204
Australia									
2004Q2-2015Q4	Import price	– 0.061292 (0.0063)	0.003145 (0.9938)	– 0.303642 (0.0664)	– 0.22188 (0.4822)	1	4.064.614 (0.0000)	– 0.944914 (0.3030)	0.767551
	PPI	0.002241 (0.6196)	0.050146 (0.5159)	0.056467 (0.0747)	0.00363 (0.9522)	0.148744 (0.0000)	1	0.558154 (0.0006)	0.77636
	CPI	0.011642 (0.0041)	– 0.06806 (0.3514)	– 0.05533 (0.8572)	0.041122 (0.4731)	– 0.031158 (0.3030)	– 0.031158 (0.0006)	1	0.57705
Canada									
2005Q3-2015Q4	Import price	0.214758 (0.0002)	0.121795 (0.7191)	– 0.143205 (0.7929)	0.139942 (0.6679)	1	1.104.063 (0.2790)	212.856 (0.2434)	0.802164
	PPI	0.000242 (0.9828)	0.023894 (0.6882)	0.040017 (0.6762)	– 0.267648 (0.0000)	0.034139 (0.2790)	1	1.125.404 (0.0001)	0.850104
	CPI	0.00451 (0.4699)	0.026826 (0.4175)	– 0.023549 (0.6596)	0.084658 (0.0049)	0.020498 (0.2434)	0.350483 (0.0001)	1	0.775172

		Oil price	Output gap	M1 (Money base)	NEER	Import price	PPI	CPI	R^2
Georgia									
2008Q2-2015Q4	Import price	0.133412 (0.2490)	0.143991 (0.7383)	0.695491 (0.0470)	0.643268 (0.2052)	1	0.053975 (0.9459)	1.247.926 (0.1750)	0.6518
	PPI	0.050109 (0.1230)	0.354911 (0.0009)	– 0.102841 (0.3198)	0.110514 (0.3198)	0.004368 (0.9459)	1	0.483461 (0.0591)	0.659245
	CPI	0.019046 (0.4983)	– 0.07079 (0.4923)	– 0.087796 (0.3147)	0.018124 (0.8843)	0.072091 (0.1750)	0.345138 (0.0591)	1	0.456128
Germany									
2004Q2-2015Q4	Import price	0.010363 (0.5200)	0.021281 (0.7768)	0.016911 (0.8376)	– 0.151301 (0.0176)	1	109.922 (0.0000)	– 0.120104 (0.8617)	0.911149
	PPI	0.025653 (0.0189)	0.085459 (0.0990)	– 0.04902 (0.3957)	– 0.015055 (0.7464)	0.960859 (0.4548)	1	0.542981 (0.0000)	0.934743
	CPI	0.0959 (0.0107)	0.069779 (0.0000)	0.007771 (0.6985)	– 0.012273 (0.4449)	0.043265 (0.8617)	– 0.07113 (0.8617)	1	0.772763
Japan									
2004Q2-2015Q4	Import price	0.252877 (0.0002)	121.048 (0.0084)	1.276.511 (0.3202)	0.535754 (0.0218)	1	2.734.149 (0.0715)	–2.798104 (0.1152)	0.582621
	PPI	0.009733 (0.2277)	0.029946 (0.5646)	– 0.061443 (0.6599)	– 0.104707 (0.0000)	0.031966 (0.0715)	1	0.434499 (0.0210)	0.720418
	CPI	0.006077 (0.3827)	0.006876 (0.0293)	0.883807 (0.3635)	0.034019 (0.1241)	– 0.024122 (0.1152)	0.32038 (0.0210)	1	0.346055
Russia									
2004Q2-2015Q4	Import price	– 0.015496 (0.8884)	– 0.060153 -8518	– 0.344395 -0,1233	– 0.605666 (0.1060)	1	10.323.525 (0.2136)	1.240.243 (0.0097)	0.343487
	PPI	0.082905 (0.0000)	– 0.055022 (0.3906)	– 0.012182 (0.7886)	– 0.250727 (0.0003)	0.041303 (0.2136)	1	1.728.336 (0.0790)	0.640201
	CPI	– 0.04393 (0.2286)	0.018636 (0.0765)	0.009666 (0.1974)	– 0.019273 (0.1241)	0.013828 (0.0097)	0.048166 (0.0790)	1	0.518845
Singapore									
2004Q2-2015Q4	Import price	0.264300 (0.0161)	0.478075 (0.1315)	– 0.136606 (0.6215)	1.448.164 (0.1135)	1	0.104115 (0.3765)	0.083371 (0.0430)	0.716429
	PPI	0.254147 (0.0000)	– 0.262566 (0.1841)	– 0.053164 (0.7572)	– 0. 816062 (0.1525)	0.104115 (0.3756)	1	1.658.494 (0.0430)	0.763368
	CPI	– 0.021584 (0.1729)	0.152321 (0.0001)	0.023212 (0.5462)	0.193792 (0.1288)	– 0.019831 (0.4526)	0.083371 (0.0430)	1	0.521697

		Oil price	Output gap	M1 (Money base)	NEER	Import price	PPI	CPI	R^2
Switzerland									
2004Q2-2015Q4	Import price	0.009858 (0.2572)	– 0.102693 (0.2850)	– 0.137267 (0.0002)	– 0.008805 (0.8331)	1	1.101.765 (0.0001)	0.557096 (0.2066)	0.856221
	PPI	– 0.005607 (0.2256)	0.116354 (0.0190)	0.019881 (0.3552)	– 0.010395 (0.6399)	0.312301 (0.0001)	1	0.412392 (0.0651)	0.786648
	CPI	0.009357 (0.0038)	0.038825 (0.3006)	0.009882 (0.5320)	0.003164 (0.8461)	0.081804 (0.2066)	0.221589 (0.0651)	1	0.713689
UK									
2004Q2-2015Q4	Import price	0.105029 (0.0000)	0.137182 (0.2103)	0.125022 (0.1525)	– 0.133343 (0.2489)	1	0.956865 (0.1061)	0.328678 (0.0000)	0.889047
	PPI	0.006837 (0.5950)	0.094760 (0.0964)	0.028107 (0.5447)	– 0.092557 (0.1245)	0.263511 (0.0013)	1	– 1.135113 (0.1061)	0.885066
	CPI	– 0.000895 (0.8765)	– 0.024786 (0.3368)	– 0.041877 (0.0380)	– 0.006757 (0.8050)	– 0.062451 (0.1061)	0.328678 (0.0000)	1	0.711736
USA									
2004Q2-2015Q4	Import price	0.072408 (0.0063)	– 0.370187 (0.2465)	– 0.087599 (0.2455)	– 0.129173 (0.1820)	1	1.093.825 (0.0017)	0.765970 (0.2765)	0.956663
	PPI	– 0.001940 (0.8773)	– 0.060865 (0.6747)	0.045896 (0.1752)	0.042771 (0.3293)	0.221850 (0.0017)	1	1.188.928 (0.0000)	0.946278
	CPI	0.002921 -6576	0.193711 (0.0076)	– 0.011806 (0.5108)	0.010628 (0.6460)	0.042828 (0.2765)	0.327764 (0.0000)	1	0.930571
Lithuania									
2006Q2-2015Q4	Import price	0.338733 (0.0036)	1.667.310 (0.0355)	0.118862 (0.6728)	10.043.236 (0.4165)	1	1.022.114 (0.3099)	– 1.343953 (0.3984)	0.771365
	PPI	– 0.066181 (0.0022)	0.400996 (0.0055)	0.036381 (0.4897)	– 0.230652 (0.3186)	0.035989 (0.3099)	1	1.175.669 (0.0000)	0.869004
	CPI	– 0.025043 (0.0847)	– 0.196067 (0.0379)	0.005702 (0.8650)	0.202083 (0.1647)	– 0.019040 (0.3984)	0.473045 (0.0000)	1	0.596615
Turkey									
2007Q2-2015Q4	Import price	0.299404 (0.0006)	0.710988 (0.0310)	1.050.835 (0.0068)	0.892763 (0.0023)	1	0.916326 (0.2551)	– 1.131532 (0.2299)	0.817664
	PPI	0.033878 (0.1278)	0.067859 (0.3958)	– 0.079255 (0.4114)	– 0.222662 (0.0010)	0.050196 (0.2551)	1	0.809091 (0.0012)	0.69029
	CPI	0.01456 (0.9266)	–0.08483 (0.8795)	– 0.024316 (0.7184)	0.055225 (0.2815)	– 0.029981 (0.3299)	0.391345 (0.0012)	1	0.396625

		Oil price	Output gap	M1 (Money base)	NEER	Import price	PPI	CPI	R^2
Slovenia									
2007Q2-2015Q4	Import price	0.396103 (0.0000)	– 0.127117 (0.7003)	0.281583 (0.5477)	1.437.817 (0.1613)	1	3.656.458 (0.0037)	– 2.665408 (0.1180	0.825802
	PPI	– 0.030024 (0.0321)	0.081426 (0.0310)	0.009768 (0.8899)	– 0.259480 (0.1035)	0.082397 (0.0037)	1	0.673717 (0.0054)	0.604386
	CPI	0.030221 (0.0044)	– 0.025765 (0.5067)	– 0.105365 (0.0476)	– 0.027911 (0.8282)	– 0.037044 (0.1180)	0.415511 (0.0054)	1	0.61841
Slovak Republic									
2007Q2-2015Q4	Import price	0.342503 (0.0000)	– 0.107558 (0.7285)	– 0.293560 (0.2780)	0.362943 (0.5940)	1	1.921.197 (0.0434)	– 4.003157 (0.1769)	0.763306
	PPI	– 0.024523 (0.1724)	0.081223 (0.1998)	0.246645 (0.0000)	0.024614 (0t.8622)	0.024614 (0.0434)(	1	2.248.896 (0.0000)	0.94468
	CPI	0.009713 (0.0967)	0.027466 (0.1864)	– 0.067590 (0.0000)	– 0.054647 (0.2340)	– 0.018647 (0.1769)	0.242663 (0.0000)	1	0.791281
Moldova									
2007Q2-2015Q4	Import price	0.268212 (0.1674)	– 0.889986 (0.3634)	1.087.721 (0.19134)	1.889.870 (0.1732)	1	2.554.816 (0.1175)	– 0.167677 (0.9252)	0.627904
	PPI	– 0.03466 (0.7536)	0.036483 (0.8241)	0.043261 (0.7615)	– 0.313703 (0.1704)	0.069595 (0.1175)	1	0.654732 (0.0122)	0.784372
	CPI	– 0.015335 (0.6160)	0.131465 (0.3973)	0.064737 (0.6348)	– 0.013993 (0.9510)	– 0.04201 (0.9252)	0.602103 (0.0122)	1	0.653298
Mexico									
2004Q2-2015Q4	Import price	0.024433 (0.0417)	0.154188 (0.0177)	– 0.199304 (0.0920)	0.150097 (0.0012)	1	0.815033 (0.0000)	– 0.758311 (0.0365)	0.793107
	PPI	0.005162 (0.6196)	– 0.015076 (0.7796)	0.200545 (0.0425)	– 0.157005 (0.0000)	0.579570 (0.0000)	1	0.879679 (0.0030)	0.681878
	CPI	– 0.007523 (0.1691)	– 0.000139 (0.9361)	– 0.130062 (0.0121)	0.040739 (0.0624)	– 0.152748 (0.0365)	0.249185 (0.0030)	1	0.334906
Latvia									
2005Q2-2015Q4	Import price	– 0.001779 (0.9073)	0.206196 (0.1637)	0.036638 (0.5883)	– 0.808440 (0.0049)	1	0.280106 (0.1917)	0.318433 (0.2020)	0.665265
	PPI	– 0.006288 (0.6378)	0.149629 (0.2507)	0.103256 (0.0735)	– 0.431213 (0.1014)	0.214482 (0.1917)	1	0.734319 (0.0002)	0.737664
	CPI	0.008217 (0.4729)	– 0.058718 (0.6038)	– 0.110530 (0.0235)	0.598436 (0.0058)	0.180488 (0.2020)	0.543560 (0.0002)	1	0.613743

		Oil price	Output gap	M1 (Money base)	NEER	Import price	PPI	CPI	R^2
Kazakhstan									
2004Q2-2015Q4	Import price	0.062182 (0.0084)	– 0.045297 (0.5990)	– 0.011296 (0.5454)	– 0.115876 (0.1202)	1	– 0.092317 (0.0547)	0.172881 (0.1269)	0.428576
	PPI	0.377257 (0.0000)	– 0.383714 (0.2668)	0.003639 (0.9618)	– 0.608648 (0.0402)	– 1.514697 (0.0547)	1	0.670918 (0.1444)	0.745016
	CPI	0.024682 (0.5740)	0.107710 (0.4718)	0.033823 (0.2950)	0.184033 (0.1584)	0.524580 (0.1269)	0.124084 (0.1444)	1	0.236699
India									
2007Q3-2015Q4	Import price	0.145050 (0.2011)	1.919.140 (0.0668)	– 0.726146 (0.4296)	0.817419 (0.0784)	1	2.449.073 (0.1658)	0.734855 (0.6285)	0.622122
	PPI	0.027653 (0.0310)	0.171561 (0.1671)	– 0.079164 (0.4613)	– 0.131848 (0.0118)	0.033389 (0.1658)	1	0.513023 (0.0034)	0.745802
	CPI	– 0.08270 (0.5745)	– 0.358867 (0.0049)	0.042719 (0.7180)	0.039350 (0.5203)	0.013016 (0.6285)	0.616202 (0.0034)	1	0.51812
Finland									
2004Q2-2015Q4	Import price	0.370306 (0.0000)	– 0.370547 (0.4581)	– 1.062738 (0.0635)	0.0837012 (0.1720)	1	– 1.570192 (0.2033)	4.342.985 (0.1126)	0.734894
	PPI	0.004865 (0.6544)	0.063278 (0.3448)	0.0485898 (0.5396)	– 0.041593 (0.6177)	– 0.028382 (0.2033)	1	0.645068 (0.0784)	0.321601
	CPI	0.001589 (0.7444)	0.063278 (0.0000)	0.005467 (0.8779)	– 0.045390 (0.2201)	0.015761 (0.1126)	0.129510 (0.0784)	1	0.695456
China									
2004Q2-2015Q4	Import price	0.008856 (0.2685)	0.017893 (0.8063)	– 0.081635 (0.0235)	0.063237 (0.1457)	1	0.013846 (0.6997)	0.555628 (0.0008)	0.581551
	PPI	0.066708 (0.0702)	0.573423 (0.0860)	0.087269 (0.6164)	– 0.007282 (0.9718)	0.302019 (0.6997)	1	0.261841 (0.7536)	0.422184
	CPI	0.011222 (0.1325)	0.184509 (0.0044)	0.045045 (0.1938)	– 0.015305 (0.7115)	0.489730 (0.0008)	0.010582 (0.7536)	1	0.692488
Chile									
2006Q2-2015Q4	Import price	0.284967 (0.0002)	0.871590 (0.1341)	1.387.600 (0.0046)	0.651668 (0.0489)	1	1.040.848 (0.0231)	1.523.382 (0.2795)	0.781109
	PPI	– 0.017844 (0.5975)	– 0.130087 (0.5804)	– 0.100873 (0.6289)	– 0.393281 (0.0016)	0.1264348 (0.0231)	1	1.027.277 (0.0609)	0.692523
	CPI	– 0.004205 (0.7124)	0.141448 (0.0668)	– 0.022647 (0.7478)	– 0.057533 (0.2034)	0.027329 (0.2795)	0.116714 (0.0609)	1	0.638534

		Oil price	Output gap	M1 (Money base)	NEER	Import price	PPI	CPI	R^2
Brazil									
2008Q2-2015Q4	Import price	0.140916 (0.3591)	1.592.166 (0.2680)	0.584938 (0.4944)	0.140847 (0.6990)	1	1.653.798 (0.2140)	3.598.997 (0.5610)	0.720737
	PPI	0.002926 (0.4234)	0.672386 (0.0019)	0.071605 (0.6170)	– 0.047909 (0.4276)	0.046008 (0.2140)	1	– 2.999505 (0.0009)	0.609943
	CPI	0.002926 (0.6037)	0.152825 (0.0010)	– 0.020946 (0.5017)	– 0.000572 (0.9657)	0.004773 (0.5610)	– 0.143000 (0.0009)	1	0.606603

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PAPER

Does Armenian Higher Education System Enjoy Academic and Institutional Autonomy Required by the Bologna Process?

Marta Sandoyan

Abstract The purpose of this working paper is to look at the higher education system of Armenia and find if it is institutionally autonomous thus academically free from the Bologna Process perspective. The paper shows that principles and norms on institutional autonomy are neither enforced by law nor implemented in practice. The study comes to this conclusion through careful review and examination of domestic legislation and policy on higher education in Armenia and by comparing them to the standards of the European Higher Education Area.

Keywords: Education, Higher Education, Postgraduate Education, Doctoral Education, Research Institutions, Higher Education Institutions, University, Institutional Autonomy Academic Autonomy, Academic Freedom, Education Expenditures, Education Finance, Tuition, Governance of Education, Management of Education, Higher Education System, Armenia, Bologna Process, European Higher Education Area

JEL Classification: I22, I23, I28, H52, H75, I2

This research seeks to assess the level of institutional autonomy of the higher education system in Armenia and review to what extent it is consistent with the standards of the European Higher Education Area (EHEA). Notwithstanding the number of important principles of the Bologna Process that are assigned by law in Armenian domestic legislation on higher education, many norms of the EHEA prescribed on paper are not followed and implemented in practice. Furthermore, many fundamental provisions of the Bologna Process are not yet enforced in domestic legal acts and there is an urgent necessity for further regulatory reforms in the sphere of higher education. Institutional autonomy and academic freedom are cornerstones of the Bologna Process of which Armenia is a member[1]. Academic autonomy is defined as freedom in knowledge creation, learning and teaching with no state intervention. Higher education

1 Institutional and academic autonomy of the universities is defined by the following documents of the Bologna Process: Convention on the Recognition of Qualifications Concerning Higher Education in the European Region (Lisbon Recognition Convention) 1997; Joint Declaration of the European Ministers of Education (Bologna Declaration) 1999; Budapest-Vienna Declaration on the European Higher Education Area 2010; Berlin Communiqué 2003; Bergen Communiqué 2005; London Communiqué 2007; Leuven and Louvain-la-Neuve Communiqué 2009; Bucharest Communiqué 2012, Yerevan Communiqué 2015

Marta Sandoyan (✉)
Senior lecturer at the RAU Institute of Economics and Business
PhD student at the Russian-Armenian University, Yerevan, Armenia
e-mail: martasandoyan@gmail.com

institutions are institutionally (as such also academically) autonomous when their academic and administrative power is free from state control and interference[2]. The role of the government is seen solely as a quality control, monitoring and supervising body. Academic freedom and institutional autonomy are inseparable indicators of a democracy. Academic freedom cannot exist without institutional autonomy of the higher education institutions[3].

Being inherited from the Soviet era the Armenian system of higher education is highly centralised. My central argument is that no tangible reforms in liberalisation and decentralisation of the higher education system have been implemented so far in Armenia. This undermines democratic principles in governance of higher education, directly violates basic requirements of the Bologna Process, and strongly hinders the process of integration into the EHEA.

A research gap exists in the studies and analysis of higher education reforms in post-communist countries, including Armenia, from the perspective of the Bologna Process and in the context of institutional and academic autonomy. Various national and international reports, studies and policy papers on the Bologna Process implementation provide data on the introduction of the European Credit Transfer and Accumulation System in the EHEA, promotion of students and academic mobility, recognition of qualifications, transfer to a three-cycle qualifications system, equality policy, and social dimension[4]. However, no or very little research data and analysis are available on academic autonomy in those countries, while these issues need urgent analysis for future regulators and policy makers. For this essay I employed qualitative research methods, more specifically - content analysis, as I was interested in focusing on the particular categories needed for this topic analysis. I employed the case-study approach focusing on Armenia. My literature survey consisted of the Armenian and Bologna Process and the EHEA documentation, legislation, treaties, reports, and policies.[5] I carefully reviewed regulations, policy papers, recent

2 Robin Middlehurst and Pedro Nuno Teixeira (2012), Governance Within the EHEA: Dynamic Trends, Common Challenges, and National Particularities, in European Higher Education at the Crossroads: Between the Bologna Process and National Reforms ed. by Adrian Curaj, Peter Scott, Lazăr Vlasceanu, Lesley Wilson, Part 1, Chapter 29, p.527, Springer.

3 Adrian Curaj, Peter Scott, Lazăr Vlasceanu, Lesley Wilson (2012), *European Higher Education at the Crossroads: Between the Bologna Process and National Reforms,* Part 1, Springer.

4 Sargsyan Y. L. and Budaghyan A. S.(2008), *Bologna Process in Armenia: A Guide*, National Centre for Strategic Studies in Higher Education, Publisher: Antares, Yerevan (Language: Armenian); Sargsyan Y. L. and Budaghyan A. S. (2007), *Reshaping a Postgraduate Education Sector in Armenia in the Context of the Bologna Process: A Strategic Outline for The Reforms Agenda* , Open Society Foundations – Yerevan Branch, National Centre for Strategic Studies in Higher Education, Yerevan (Language: Armenian).

5 Principles, conventions, declarations, communiqués, action plans, memorandums, national and international implementation reports of the EHEA on the Bologna Process are available at http://www.ehea.info/article-details.aspx?ArticleId=73; The Law of the Republic of Armenia on Education (14 April, 1999, N HO – 297); The Law of the Republic of Armenia on Higher and Postgraduate Professional Education (14 December, 2004, N HO-62-N); The Law of the Republic of Armenia on Scientific and Engineering Activities (5 December, 2000, N HO-119); The Law of the Republic of Armenia on Military Service (16 September, 1998, N HO-250); The Decree of the Minister of Education and Science of the Republic of Armenia N 740-N on "Admissions Procedures to Postgraduate Study Programmes (Aspirantura) in the Republic of Armenia" (15 September, 2006, N 740-N); Government Resolution of 8 August 1997 N 327 on "Procedures of Awarding Scientific Degrees in the Republic of Armenia"; Government Resolution of 31 March 2011 N332-N on "National Education Qualifications Framework of the Republic of Armenia", Government Resolution of 26 December 2002 N 2140-N on "Adoption of the Procedure on the Conscription to a Compulsory Military Service of those Individuals, Who Had Defended their Dissertations, but Have Not Yet Got an Approval from the Higher Attestation Commission of the Republic of Armenia at the Ministry of Education and Science of the Republic of Armenia and Students Who Have Completed their Postgraduate Programmes (*Aspirantura*) and Have Got Appointed the Date of the Dissertation Defence";

and proposed reforms in higher education in Armenia in the context of the Bologna Process. As said above, institutional autonomy and academic freedom are in the heart of a high quality education system. The system of higher education in Armenia, I argue, undermines democratic principles of its governance. It violates the basic requirements and principles of the Bologna process and is inconsistent with the EHEA standards.

Below there is a short summary of those provisions in Armenian higher education system that create serious obstacles in the process of integration into the EHEA and democratisation of the system in general.

- The Government, having its top officials as heads of public universities' and other higher education institutions' councils directly influences the election of universities top management, strategy of universities development and building of academic and scientific policies. Members of the councils include officials from the government and parliament representing the ruling political party. As a result, the system of universities' governance is extremely politicised, and universities are used as an effective tool in various political processes.
- The National Centre for Professional Education Quality Assurance (ANQA) is a foundation responsible for institutional and programme accreditation and audit of public and private higher education institutions. Head and members of the ANQA's council are also governmental officials. Such a system undermines institutional independence of the ANQA and may be used as a manipulative tool against the universities' decision-making process.
- The funding system at the higher education institutions is another obstacle for institutional autonomy. Student funding at public universities operates under a centralised system of state order. Every year the government gives out funding to public universities with a certain amount of student sits where prospective students will be admitted free of charge. Students do not receive a state scholarship as individuals, but get a state order placement instead. Therefore, the universities compete to receive more state order placements from the government that is another strong technique to subordinate the universities and hinder their academic and institutional freedom.
- Important regulatory inconsistencies with the norms of the Bologna Process exist at a post-graduate education level. Higher education institutions are not entitled to award postgraduate degrees. They do not possess a mandate to form doctoral dissertation examination and assessment commissions. Doctoral degrees are awarded and academic titles of Professor and Associate Professor are conferred by the Supreme Certifying Commission (SCC) of the Republic of Armenia (also known as the Higher Attestation Commission or VAK) that is a division under the Ministry of Education and Science. Another of SCC's mandates is to establish and coordinate a commission for doctoral dissertations defence inside the universities. Furthermore, the Ministry's subdivision has a total control over the structuring of a postgraduate teaching process. Hence, higher education institutions do not possess the freedom to construct doctoral programmes independently. All the above mentioned strongly undermines creativity and academic

Government Resolution of 26 April 2007 N 581-N on "Adoption of the Procedure on the Standard Contract Pattern with Postgraduate Students (A*spirants*) and on the Procedure of Employment at Educational or Scientific Institutions Running Higher and Postgraduate Education Programmes for those Specialists Who Have Studied at and Completed a Postgraduate Programme (*Aspirantura*) under a State Order Scheme"; Government Resolution of 9 July 2001 N615 on "Adoption of the Procedures on Conferring the Titles of Professor and Associate Professor in the Republic of Armenia", and others.

freedom of the Armenian postgraduate education[6].

Recommendations

A Preamble to the Lisbon Recognition Convention attaches: "… great importance to the principle of institutional autonomy, and conscious of the need to uphold and protect this principle..." In the meantime, Leuven/Louvain-la-Neuve Communiqué states: "The necessary ongoing reform of higher education systems and policies will continue to be firmly embedded in the European values of institutional autonomy, academic freedom and social equity and will require full participation of students and staff.[7]" Yerevan Communiqué says: "Together we are engaged in a process of voluntary convergence and coordinated reform of our higher education systems. This is based on public responsibility for higher education, academic freedom, institutional autonomy, and commitment to integrity.[8] We will support and protect students and staff in exercising their right to academic freedom and ensure their representation as full partners in the governance of autonomous higher education institutions[9]." According to the Salzburg II Recommendations: "Institutions need autonomy to be able to establish, and be accountable for, diverse structures with different research strategies and strengths.[10]"

Based on the given analysis the following reforms should be carried out in the system of higher education in Armenia:

- The centralised system of state order must be abolished. Instead, a state merit based system of fundings and shcolarships, based on such criteria as exceptional talent, financial incapabilities, and other should be implemented. The scholarships/fundings must be awarded to the students in person, not to the higher education institutions. This will secure the impartiality and independence of the universities from the government.
- The councils of universities and accreditation agencies should consist of independent members having no professional relation to the governmental institutions.
- The awarding bodies of doctoral degrees and academic titles should be the higher education institutions possessing an accreditation to run doctoral programmes. They must have their own, internal academic councils to run and assess the doctoral students examinations, presentations, defence and other procedures. These councils should be independent, and formed by the universities with no state interference.

My research concludes that the function of the state with regard to higher education institutions should fall in the framework of supervision and monitoring. The State should create criteria for higher education management, teaching, research, science and other branches of activity and operation. It must monitor how these higher education institutions follow the criteria and take away their license or accreditation in case of non compliance. The rest should fall within the power of the higher education institutions, with no state intervention into their academic and managerial affairs. In other words, a strong quality control system must exist rather than an activity control and intervention system with strict naming and shaming outcomes. There is a counter-argument to such a strategy claiming that a decrease in quality of the entire educational

6 A principle of the higher education institutions' autonomy is also stated in the *Salzburg II Recommendations*, that define the central principles of a postgraduate education from the Bologna Process perspective: European University Association, *Salzburg II Recommendations: European Universities' Achievements Since 2005 in Implementing the Salzburg Principles,* Brussels, 2010, available at <http://www.eua.be/Libraries/Publications_homepage_list/Salzburg_II_Recommendations.sflb.ashx>

7 Leuven/Louvain-la-Neuve Communiqué, p.1

8 Yerevan Communiqué, p.1

9 Yerevan Communiqué, p.2

10 European University Association, *Salzburg II Recommendations: European Universities' Achievements Since 2005 in Implementing the Salzburg Principles,*Brussels, 2010, available at <http://www.eua.be/Libraries/Publications_homepage_list/Salzburg_II_Recommendations.sflb.ashx>

process may occur if giving the higher education institutions an absolute autonomy with no state control. However, such argument can be easily defeated by the unwritten rules of a labour and academic market where potential employers would assess the graduates according to the reputation of the universities they graduated from rather than pure transcript of grades. The better the educational process of a university the better would be opportunities and brand of this institution. Citing the Salzburg II Recommendations: "Embedding in institutional strategies and policies: universities as institutions need to assume responsibility for ensuring that the doctoral programmes and research training they offer are designed to meet new challenges and include appropriate professional career development opportunities". Finally, making the last reference to the Salzburg II Recommendations: "The crucial role of supervision and assessment: in respect of individual doctoral candidates, arrangements for supervision and assessment should be based on a transparent contractual framework of shared responsibilities between doctoral candidates, supervisors and the institution (and where appropriate including other partners).[11]"

Impact on the Higher Education System after the proposed Reforms

The best universities of the world are located in countries where the system of higher education is highly decentralised, liberal and open-minded[12]. In the host countries of top universities higher education institutions enjoy the highest degree of academic and institutional autonomy what stimulates open-minded approach and creativity in the process of education, science and research. By strengthening institutional autonomy the higher education system of Armenia will, first of all, comply with the standards and fulfill the requirements of the Bologna Process. As an outcome, universities and their direct stakeholders (academics and students) will better integrate into the European Higher Education Area. The consequences would be higher education institutions becoming more competitive on international academic arena and gaining more recources for further development and progress.

Conclusion

It is of crucial importance for the government of the Republic of Armenia to urgently reform its system of higher education, decentralise it and make it consistent with the best European Higher Education Area standards and norms. To achieve this, Armenian higher education institutions must obtain institutional autonomy and academic freedom to become capable of working, creating, and educating without direct state interference.

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12 For top university rankings see, for example, QS World University Rankings, U.S. News and World Report University Rankings, Times Higher Education World University Rankings, The Academic Ranking of World Universities -ARWU (Center for World-Class Universities of Shanghai Jiao Tong University) and other sources. For the data on institutional and academic autonomy see the National Reports on the EHEA countries, available at < http://www.ehea.info/article-details.aspx?ArticleId=86

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PAPER

Health Care and Compulsory Medical Insurance in Armenia: Problems and Prospects

Okhikyan Lilit

Abstract Armenia is a developing country with a lower-middle-income economy. Economic growth of the country depends by more than 50% on human capital. Human capital is a fundamental factor for the progressive economic development. Health care and education are the most important components influencing human capital.

This article is focused on health care in Armenia, on problems and prospects of the implementation of the system of compulsory medical insurance in Armenia. It analyzes and shows the optimal way to implement the compulsory medical insurance, in such a lower-middle-income economy as Armenia.

Keywords Medical insurance - Compulsory medical insurance - Health care

JEL Classification I13

Introduction

Despite incredible improvements in health since 1920 and modern medical technology in the 21st century millions die from easily preventable diseases, there are millions of sick people who cannot be cured, because they have no resources for that or do not do general medical examination. A lot of people lack access to health care systems. 56 million people died worldwide in 2012[1], 36 million deaths are caused by non communicable diseases, such as cardiovascular disease (17 million deaths), cancer (7.6 million deaths), chronic lung diseases (4.2 million deaths) and diabetes (1.3 million deaths). This is almost two-thirds of the total estimated number of deaths worldwide. A quarter of these take place before the age of 60. Over 7.5 million children under the age of 5 die from malnutrition and mostly preventable diseases each year. Tuberculosis kills 1.3 million people each year[2] with 9.4 million new cases a year. 1.6 million people still die from pneumococcal diseases every year (more than a half of the victims are children). Malaria causes some 225 million acute illnesses and over 780,000 deaths annually.[3] The urgency of the mentioned problem cannot be refuted. The quantity of deaths per 1000 people in 2014 in Armenia[4] increased by 15% as compared with the year 2000, 65% of them died from easily preventable diseases. Life expectancy at birth in Armenia for women was

1 http://www.who.int - World Health Organization
2 "Tuberculosis" WHO Global Tuberculosis Report 2013
3 http://www.globalissues.org
4 http://armstat.am - National Statistical Service of RA (http://www.armstat.am/file/doc/99493598.pdf)

Okhikyan Lilit (✉)
Russian-Armenian (Slavonic) University
e-mail: okhikyan.lilit@gmail.com

75 years in 2012, one year higher than in 2000, and for men it was 67 years, one year lower than in 2000 according to the World Health Organization. According to the World Bank assessment of the economies of 192 countries, economic growth depends on human capital in amount of 64%, natural capital in amount of 20%, physical capital in amount of 16%. Having a healthy and productive population, especially for such low-middle income country like Armenia with low natural capital, human capital is fundamental factor for the progressive economic development. Health care and education are the most important components influencing human capital.

This article will focus on health care in Armenia, on problems and prospects of the implementation of the system of compulsory medical insurance in Armenia. The main aim is to show the optimal way to implement the compulsory medical insurance in such a lower-middle-income economy as Armenia.

Implementation of the System of Compulsory Medical Insurance in RA.

According to the Constitution of the Republic of Armenia it is ***a sovereign, democratic, social state governed by rule of law.***[5] The main mission of the social state is the achievement of public progress based on the principles of social equality consolidated by the right, general solidarity and cross liability. The social state is urged to help the weak part of its population, to influence distribution of economic goods proceeding from the concept of justice to provide everyone with aworthy existence. Human capital is a fundamental factor for the progressive economic development of Armenia which can be increased by investing in health care, education and job training. The number f deaths in 2014 in Armenia[6] increased by 15% as compared with the year 2000[7], 65% of them died from easily preventable diseases which show the weakness of our health sector. The leading causes of deaths are listed below (Table 1).

Table 1 The leading causes of death in Armenia in 2014

	January-December 2014 (pers.)
Number of deaths including deaths of:	27 700
Cardiovascular Disease	13 329
Accidents, unintentional Poisoning and Injuries	1 296
Malignancies	5 700
Respiratory System Diseases	1 724
Diseases of the Digestive System	1 200
Infectious and Parasitic Disease Deaths	300
other Diseases	4 151

Registered health care visits increased by 34% in 2014 compared with the year 2013. 66% of them are children up to 14 years.

Main cases:

- Influenza 93% (63% are 0-14 years old children)
- Gastrointestinal diseases 5% (4% of 0-14 years old)
- Syphilis is about 1% of adults

Here are negative trends of socio-demographic and health indicators in Armenia in terms of socio-political change: birth rate and natural growth rate decline, life expectancy at birth remained the same (71 years, both sexes) compared with the year 2000, a steady increase in the

5 The Republic of Armenia is a sovereign, democratic, social state governed by rule of law.

6 http://armstat.am - National Statistical Service of RA

7 http://www.armstat.am/file/doc/650.pdf

overall mortality rate due to the increase of socially significant causes of death, in particular, the number of cardiovascular diseases, malignancies, diabetes, respiratory system diseases, diseases of the digestive system, etc., increased the number of the registered diseases with the diagnosis set for the first time (increased by 113% in 2012 since 2001 per 100,000 population, particularly the number of sick people with all the types of diseases increased).

Steps of development of the health system in Armenian

- the collapse of the Soviet health system, providing the population with affordable and free medical care;
- The rapid commercialization of the health care system in the Armenian market conditions and a growing number of private clinics, which increases the share of private funding in the health care system (Number of medical institutions rendering out-patient and dispensary aid to population increased by 12% comparing to 2001, Number of antenatal clinics, children's polyclinics and number of institutions with antenatal clinics and children's policlinics increased by 7% compared to 1997 and decreased by 4 compared to 2001, the number of hospitals decreased by 29% comparing to 1997,
- Provision of health services on a fee basis by many government clinics.
- Inequalities in access to health services;
- Change true stratification of the population, based on today is not the social background, and income level;

Reasons for not receiving the necessary treatment in Armenia

- Unavailability;
- Lack of information;
- Mistrust in relation to providers of medical services;
- Mentality, "A peasant needs thunder to cross himself and wonder."

The process of the healthcare system reform in the newly formed states, including the Republic of Armenia, began after the collapse of the USSR. The most important document and basis for changes was "The development and reform Program of health care in Armenia" (approved by the Government in 1997), the main directions of which became: a) implementation of compulsory medical insurance of citizens of the republic; b) development of primary medico-public assistance; c) improvement of quality of the provided medical services; d) development of various patterns of ownership in health sector. In 1997-1999 attempts were made to implement the compulsory medical insurance of citizens, but they did not find sufficient support in the Parliament due to concerns that the government does not have sufficient funds to maintain health insurance.

Instead, some reforms were made, caused mainly by changes in governance mechanisms and sector financing: decentralization of management, unitsipalizatsiya (and further privatization) the main part of medical institutions, the introduction of multi-channel and multi-structured financial system management, implementation of targeted programs for financing. Some structural changes were also carried out: the creation of regional health authorities, a number of changes in medical education (introduction of a new system of postgraduate training of health care managers, physicians and nurses).

Eventually the following reforms were carried out:

- Financing of maternal healthcare services, of treatment and prevention of diseases for children up to 7 years, of the treatment of certain diseases (infectious diseases, cancer, and others.), A number of urgent treatment of diseases and conditions within the framework of the so-called "state order";
- The Government finances certain social groups (persons with disabilities, persons with high score insecurity receive poverty benefits, etc.)

- Free primary health care in Armenia since January 1, 2006.
- Implementation of the principle of a co-payment for the persons which do not enter the above national groups since February 1, 2011 which means that the part of the expenses on treatment cares the patient himself.

Reform Results:

- Increase of system work productivity;
- Reducing a shadow health care (in form of the gratitude money);
- Some increase in availability of medical care;
- They do not promote reducing of direct expenses of the population therefore decrease the level of financial security of the population.

Real development of voluntary health insurance started in 2005. Insurance companies sign contracts with corporate clients mostly. 1.3% of the population (some with family members) had voluntary health insurance with different coverage, most of which was financed by employers in 2013. 90% of them were insured against accidents in 2013. 63% of that insurance premium was paid as insurance indemnity. There are some nuances in that market. Insurance companies do not trust the insured persons because they know the mentality of the population of Armenia who does not have a culture of care of their health. Furthermore the population does not have extra money to spend on "some promise about help". Poverty according to official statistics is 32% with the calculation of the minimum wage and about 60% with the calculation of the consumer basket.[8]

The analysis of health system reforms in different countries, including the countries of Central and Eastern Europe and CIS countries, suggests the possibility of selecting one of the two alternatives of health care reform: the first is to improve the existing model, the second is to switch to a fundamentally different model.

We partially understand the existing health system model in Armenia. Private health expenses are higher than public expenses. There is voluntary health insurance, but this service is suitable for corporate clients but not for individuals. The prices for healthcare services increase annually. The incomes of the population decrease or remain unchanged. A lot of people do not do general medical examination because they do not have money for expensive medical services and there is a lack of trust to cheap and free medical services. As we saw the causes of deaths are preventable diseases mostly, which could be cured if a person made general medical examination every year and started the treatment in time. So, where is the solution of the problem? How to make people trust the health system and how to acculturate caring of your health, how to make most services available for the majority of people? Worldwide there are the following forms of medical care, sometimes complementing each other:

- Private medicine;
- Voluntary health insurance;
- Compulsory health insurance;
- (National) Public health system.

For choosing the required form for Armenia, we have to understand advantages and disadvantages of each, which are listed below (Table 2).

The effective healthcare is formed with a combination of compulsory and voluntary medical insurance.

8 Sandoyan, E. M. and Avetisyan, A. G. The problem of poverty reduction in the context of the formation of long-term financial resources in Armenia (p. 187-188). VIII International Conference Kondratievskaya "Cyclical global processes, Kondratieff cycles and long-term vision of development of Russian and world peace", International Fund for ND Kondrateva.- M: IFC, 2012. ISBN978-5-8211-0605-6.

Table 2 Advantages and disadvantages of different types of Medicare system

	Advantages	Disadvantages
Public health system	Full coverage of the population Control of the prices of medical services Guarantee of free provision of the minimum amount of medical services	The monopolization of health care Ability to ignore the rights of patients Lack of opportunities to choose a doctor and hospital
Insurance Medicine	Possibility to choose a doctor Possibility to choose a medical institution Optimal distribution of financial resources Availability to have insurance policies through participation of employers or funds of social security Possibility of free granting medicine	Medical services depends on conditions of the policy Existence of exceptions on insurance coverage Possibility of financial frauds
Private medicine	Rationing of medical expenses Possibility to choose a doctor and a medical institution	Commercialization of health care Lack of professional control over the volume and quality of services

However, taking into consideration the population social status, the already high taxation of medium business, I consider necessary to offer the following changes in health system:

1) Financing

The main source of financing of the health system in Armenia is the private sector. Total expenditure on health in 2012 was 4.4% of GDP where 2.6% is private expenditure and 1.8% public expenditure, less than in European countries. However, for the proper functioning of Medicine WHO recommends the minimum required value of the public health expenditures by 6.8% of GDP for developed countries and not less than 5% of GDP for developing countries. Thereby preliminary it is offered to raise public health expenditures to 4-5% of GDP.

2) Payment mechanism

That means a mechanism of paying to doctors and medical organizations for the provided medical care. The suggested scheme is introduced in Structure 1. It needed to open an autonomous body in an insurance company to practice medical insurance, to involve specialists (physicians) that supervise the volume and quality of provided services.

In this case everybody would have a Compulsory Medical Insurance policy which would cover:

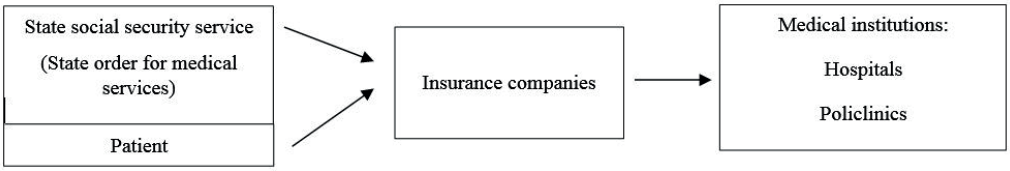
- Annual general medical examination
- Ambulance and emergency medical service
- Stationary medical care
- Medicines
- Pregnancy

The process would be the following: if the insured has health problems he calls the insurance company, the company starts the treatment process organization and supervision. After providing medical services to patients the hospital gives the bill for payment to the insurance company, and if it is a state order or a voluntary health insurance, the insurance company pays for the patient and takes money from the relevant authority. Medical institutions are interested in granting qualitative medical services, however this is not realistic in case the state or the patient pays to medical institutions directly as they have no opportunity to trace and supervise the process, volume and quality of the provided services. As a result of this the medical institutions which are much more qualified receive much more financial flows and thus the health care develops and improves, the newest medical equipments are received, and the quality of medical services get

better, the wellbeing of the population increases.

After healthcare acculturating, people may have voluntary medical insurance and the structure will develop better.

Figure 1 Treatment payment mechanism



Conclusion

The effective healthcare is formed with a combination of compulsory and voluntary medical insurance. We can see the following outcomes of that reform.

Positive results are:

- Full coverage of the population
- Increase of annual general medical examination visits
- Discovery and treatment of preventable diseases in time
- Optimal distribution of financial resources
- Professional control over the volume and quality of provided medical services
- Fixed price list of medical services
- Financial flows in a high qualified medical institutions
- Medicine development + new equipment, etc.
- Quality growth of medical services
- Reducing a shadow health care (in form of the gratitude money)
- Possibility to choose a medical institution
- Clear access to medical services
- Health care culture

Negative Results:

- Medical services depend on conditions of the policy
- A limited list of covered diseases
- Exceptions in the voluntary insurance policy
- Giving privilege to several medical institutions from the side of insurance companies
- The risk of making a business on this structure (e.g. both the insurance company and the medical institution belong to the same person)

Implementation problems:

- Absence of cooperation practice between governmental authorities and the private sector
- Absence of trust towards the financial and medical institutions
- Lack of insurance culture and health care culture
- Lack of money to get an insure policy voluntarily.

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PAPER

Tax Policy Impact Analysis. The Armenian Case

Simonyan Vardan M.

Abstract Optimal management of a state budget is one of the cornerstones for every country on their path of prosperity. For most countries the major element of state income are taxes. The taxation allows redistributing income flows between different economic subjects within the country. Taxation models may differ from country to country. It depends on the particular economic structure of the particular state. For instance, some countries apply lower tax rates which allow them to have higher incomes for economics subjects, including firms and households. As a result, the government expenditures in the form of subsidies and direct transfer may decrease. The result may be a higher variance for income distribution between the populations. Another model, more socialistic one, looks totally different – higher taxes applied in the country result in higher social assistance from the government, which may cause equal social-economic structure. Thus, it is an object of analysis for every country what tax policy to apply. In addition, in long term, this policy may face some modifications. Therefore, it is very important to analyze how changes in that policy will affect the economy.

Keywords Taxation - Tax policy - Microeconomics - General equilibrium model - Social Accounting Matrix

JEL Classification D57

When applying a certain policy, governments often not only need to estimate its influence on large aggregated segments of the economy, but also have to disaggregate some of them into smaller groups. Otherwise the results of the analysis cannot be significant and the policy may lead to unpredicted and unwanted effects. When we consider tax reforms, regardless of how they are applied, households will necessarily be affected. In this case, the presence of inequality in social welfare raises the question of behavioral diversity among different groups of households.

The most convenient and effective method to solve this problem is the construction of a general equilibrium model. This approach is based on neoclassical concepts of rationality, market clearing and rational expectations.[1] Economists such as Ysidro Edgeworth, Leon Walras and Vilfredo Pareto had decisive impact on defining the concept of general equilibrium. Later, Kenneth Arrow and Gerard Debreu appeared to be the first who formalized the theory of general equilibrium into economic-mathematical model called Computable General Equilibrium (CGE) model.[2]

1 Andreu Mas-Colell- "Microeconomic Theory"
2 John Geanakoplos - "Arrow-Debreu Model of General Equilibrium"

Simonyan Vardan M. (✉)
Russian-Armenian (Slavonic) University, Yerevan, Armenia
Email: varsim@gmail.com

The model comprehensively analyzes the influence of economic changes on the economic segments that are included (e.g. households, industries). Each subject in the model is rational and is aimed to solve its own optimization problem. For firms it will be profit maximization, for households – utility maximization. This brings the whole economy to the equilibrium point – no excess demand for a good. When an economic reform is carried out, it will naturally affect the optimization process of all segments of the economy. Consequently, this will change solutions of their optimization problems and a new equilibrium point will be established. Thus, making a simulation and analyzing the shift of the equilibrium point will allow to conclude how the reforms affect the economy.

CGE is widely used by such organizations as International Monetary Fund (IMF), World Bank (WB), OECD and others. In this paper, we will apply the model to the Armenian case. The Republic of Armenia (RA), being a member of the Eurasian Tax Union (ETU), must increase its import tariff ratios in a defined way for the third party countries that are not included in the Union.[3] Now let us try to estimate how this change will affect the inner social-economic situation of Armenia.

Because the official tariff change data is given in the Harmonized System (HS) classification, and the CGE model uses NACE classification of goods, we first classify all the imported goods of Armenia by NACE1. There are 5 major sectors of NACE which include all the imported flows: Sector A - agriculture and fishing, Sector C – Mining, Sector D – manufacturing, Sector E – Utilities (incl. natural gas, water supply, electrical energy) and Sector "Others". Thus, having the tariff change data in HS classification and the values of imports of Armenia in HS[4], we can calculate the increase of imported goods prices in NACE 1 classification. For that, we calculate the weighted average increase in price of each of the given five major NACE sectors (A, C, D, E and "Other").

Table 1

Name	Description	Import Price Index
SectorA	Agriculture and fishing	5,7%
Sector C	Mining	10%
Sector D	Manufacturing	6,3%
Sector E	Utilities (incl. natural gas, water supply, electrical energy)	2,6%
Other		0,06%

Now, when we have the actual import price changes of NACE 1 sectors, we are able to run the proper simulation in the CGE model. The model uses the algorithm of so-called Mixed Complementarity Problem (MCP), which considers the standard economy of Arrow-Debrew with **n** goods, **m** sectors and **h** institutions with its equilibrium conditions. [1]

As a result, the problem of MCP looks as the following:
Given: $f: Rn \rightarrow Rn$
Get: $z \epsilon Rn$
Such that: $f(z) \geq 0, z \geq 0, zT * f(z) = 0.$

3 http://www.eurasiancommission.org/ru/act/trade/catr/ett/Pages/default.aspx
4 http://www.intracen.org/itc/market-info- tools/trade-statistics/

The solution of the problem $z = [y, p, M]$ and $f(z) = [\Pi_j(p),\xi_i,(\Sigma_h p_i b_{ih}-\Sigma_h p_i d_{ih})]$ is the equilibrium point we are looking for. [4]

Our CGE model is based on Social Accounting Matrix (SAM), constructed from the input-output table of RA of 2006 year (the latest possible year). Therefore, the output of this model may most probably be deviated from an output of a model with an updated SAM. Below the results of the simulation, featuring the increase of the import goods tariffs (as shown in the table 1), are presented. In each row, we can see sectors listed in terms of NACE 1[5] and their representative outputs of the model.

Table 2

NACE 1 Sectors	Perc, used as production (%)	Changein prod (%)	Change in prod (abs. v.)
SectorA	14.9	-0.9	-8940.33
SectorB	14.9	-1.3	-372.46
Sector C	45.2	-2.3	-4443.15
Sector D	48.2	-2.8	-23648.6
Sector E	50.5	-0.3	-751.146
Sector F	15.8	-0.1	-433.209
Sector G	4	0.9	21625.39
Sector H	48.5	-10	-8172.17
Sector I	11.5	-1.9	-7689.42
Sector J	4	-0.8	-2101.57
Sector K	2.2	-0.8	-1233.2
Sector L	0.3	22.5	38696.23
Sector M	17.4	4.4	1975.974
Sector N	0	1.8	794.4534
Sector O	0	1	198.583
Sector P	0	-0.9	-18

As we can see from the Table 2, the impact is heavily negative. This happens because a certain amount of the imported goods that are more costly for the Armenian domestic market, are used not only by households as a final consumption, but also by producers as intermediate consumption. As a result in the sectors with the highest amount of usage of the imported goods, the decrease in production has the highest values. This is caused by the highly increased producer's cost and, consequently, the final prices for the goods.

To conclude, we can state that Armenia is highly sensitive to an increase in import tariffs. It is explained by the fact, that Armenian import is 30.6% of the country's GDP. Therefore, such a strict reform of the tariff regime may cause a shock therapy to the Republic's social-economic situation. Surely, the results are not the perfect representation of what will happen; because the model has its assumption, restrictions, and the data itself is not perfect (input-output table has not

5 http://ec.europa.eu/eurostat/documents/1965800/1978839/NACEREV.2INTRODUCTORYGUIDELINESEN.pdf/f48c8a50-feb1-4227-8fe0-935b58a0a332

been updated since 2006 and in the model the outdated structure is used). However, the results of the simulation clearly worn us of the incoming risks, and additional treaties, such as bilateral agreements and temporal exceptionsfor some goods' tariff rates, may become helpful.

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PAPER

Conceptual Approaches for Development of Mono Cities in Armenia

Avagyan Harutyun

Introduction September 21, 2016 marked the 25th anniversary since Armenians voted for Independence from Soviet rule and re-established the Republic of Armenia. The new Republic had many challenges to face from its first day of the re-establishment: the 1988 devastating earthquake, ongoing war with Azerbaijan and total collapse of the industry sector. Now looking back many problems have been solved in favor of Armenia: the nation achieved victory in the battle and years later even gained the status of The Caucasian Tiger Economy. But the country still is not able to regain its industrial power it once had. After the collapse of the USSR the industry sector of Armenia deteriorated and this caused a high unemployment rate in the small industrial cities of Armenia. This led to high emigration which is a well-known economic problem which destabilized the situation of Armenia. Each year thousands of Armenians leave the country for a better future seeking financial stability. The main reason is unemployment and low economic growth as well as the huge economic disparity between the regions of the country. Since the establishment of the local government system in Armenia (1995), one of the essential issues is the administrative structure, more specifically its high level of fragmentation. The harmonious territorial development strategy in Armenia is not yet fully developed and is predominantly fragmentary in nature. Although certain official documents, such as the Main Resettlement Project of the RA, National Security Strategy of the RA, Stable Development Strategy of the RA, 2012-2016 Plan of Action concerning the Implementation of the State Migration Regulatory Strategy Concept, 2010 – 2012 Rural and Agricultural Stable Development Strategy of the RA, Regional Development Concept of the RA, Community Enlargement and Concept for the Creation of Inter-community Unions and other documents include the vital aspects necessary for implementing an efficient harmonious territorial development strategy and are surely useful for creating a general strategy, they do not envelop the entirety of the issues and certain vital challenges have been left out. Among them is the issue of the comprehensive development of small cities, which is not yet analyzed as a separate issue in the general context of the country's administrative improvements and harmonious territorial development. This paper tries to fill this gap and to provide some policy advises on future development of the small cities in Armenia. In the first part of the paper we analyze the small city (monotown) concept and problems associated with it. In the second part we test the hypothesis of the connection between migration and small city effect. We use the Ministry of Territorial Administration database for 2014 which is the latest and the most accurate data available in Armenia. Our findings conclude that there is a positive dependence

Avagyan Harutyun (✉)
American University of Armenia
e-mail: avagyan.harutyun@gmail.com

between migration and the effect of being a monotown. In the third part we provide some innovative ideas on how the situation can be improved using the impact generating methods.

Keywords Mono cities - Small cities - Armenia - Migration - Urban development

JEL classification O18

Monotown

The notion of "City" is different for every country. In general cities are classified according to size (size of the population), geographical location and functions; more specifically, according to the size of the population cities are classified as small (less than 50 thousand), medium (50-100 thousand), large (100 thousand – 1 million) and extremely large (more than 1 million). However, in some countries (Denmark, Sweden, Finland), for a settlement to be considered a city, it must have a population of over 200 or over 1000 (Canada, Australia) or over 2000 (France, Cuba) and so on. The contemporary city usually carries out several functions: administrative – political, industrial, commercial, transportation, cultural, academic, health (although there are also cities that carry out only one function: Oxford, Cambridge, Vatican, Jerusalem and others).

Historically small cities in Armenia were established as administrative, social – cultural or industrial centers and were characterized by small volume production development. In the outcome of the administrative division, small cities were mostly established in the Soviet times as city-like settlements. Previously there were 63 urban localities, including 27 cities, 24 of which under central, 3 under regional administration and 36 city-like settlements.

After gaining independence, 17 of the city-like localities and 3 of the urban localities that were considered Soviet administrative units, gained a city status according to the 1995 Administrative Division Law of the RA. After the fall of the Soviet economic system some cities under regional administration fell into a state of crisis. The new economic model eliminated the existing urban development objects rendering the residents unemployed, emigration rose, the demographics gradually changed.

According to the Administrative Division Law of the RA, the territory of the RA is divided into 10 regions and 915 communities, of which 19 are urban and 866 rural. As of 1st January 2014, 1914.1 thousand residents live in urban localities (including 1068.3 in Yerevan) and 1103.0 thousand residents live in rural localities.

Table 1 Classification of the cities of the RA according to the size of the population

Name of the region	Number of cities	Including cities according to the size of the population (in 1000 residents)					
		Micro cities, less than 5 000	Small 5-20 000	Medium 20-50 000	Large 50-100 000	Macro 100-500 000	Super Large, more than 500 000
Aragatsotn	3	-	2	1	-	-	-
Ararat	4	-	1	3	-	-	-
Armavir	3	-	1	1	1	-	-
Gegharkounik	5	-	3	2		-	-

Name of the region	Number of cities	Including cities according to the size of the population (in 1000 residents)					
		Micro cities, less than 5 000	Small 5-20 000	Medium 20-50 000	Large 50-100 000	Macro 100-500 000	Super Large, more than 500 000
Lori	8	3	4		-	1	-
Kotayk	7	1	3	2	1	-	-
Shirak	3	-	2		-	1	-
Syunik	7	3	2	2		-	-
Vayots Dzor	3	-	3	-	-	-	-
Tavoush	5	1	3	1	-	-	-
Yerevan	1	-	-	-	-	-	1
	49	8	24	12	2	2	1

One of the bequests of the planned economy in Armenia is the existence of mono profile localities, which were established based on the principle of developing territorial – industrial complexes, where production cycles (production components) were irreversibly tied to the social responsibility that the given enterprise had within the society. With the implementation of a new economic model, socio-economic challenges came about which stemmed from years –worth of objective reasons.

Currently a universal definition of mono cities is not found in Armenia's official documents or academic literature, nor are there universal criteria and indicators that define mono cities. According to the best practices of different countries, mono cities are comprised of 10 – 200 000 residents, which are characterized by the integration of at least 20% of the workforce in mono profile urban development enterprises in the territory. According to the above definition, 20 out of 49 towns can be considered as a monotown. This number is reached by dividing the number of people working in one industry by the total number of employed people. It is worth noting that in 5 towns more than 20% of population work in one company. With narrow economic bases, large-scale layoffs, and few short-term opportunities for alternative employment, mono cities took the brunt of the crisis. So, the current administrative – territorial division of the RA dictates a new and unique approach to the classification of mono cities.

The monotown effect as reason for migration

We now pass to our hypothesis testing: Is being a city a monotown effected by a higher rate of migration? The main idea is that the Soviet mono cities were not sustainable and lacked of diversification which resulted to a higher unemployment and eventually a higher migration rate after its collapse.

Poverty and emigration remain among most important issues in Armenia. Poverty has its negative effect on migration. By the definition of World Bank "poverty is the inability to ensure an acceptable minimum of certain living conditions." According to recent studies, poverty in Armenia remains high. In 2008-2013 the poverty growth rate was more rapid in urban than in rural regions; furthermore poverty in urban regions (except Yerevan) is higher than the national

average (32.0%), constituting 39.3%. It is worth noting that the urban population, 63.8%, makes up the majority of the poor, and 70.1% of the extremely poor population (Gagik Gevorgyan 2014). While the unemployed faced the highest poverty risk (38.1%) among the economically active population, from the standpoint of urban/ rural distinction it appeared that in 2014 poverty rate among the unemployed living in other urban communities was 1.3 times higher (46.9%) than that among the unemployed living in Yerevan.

This high level of poverty results in a higher rate of migration. Economic migration is defined as a choice to move to improve the standard of living by gaining a better paid job. According to Household's Integrated Living Conditions Survey (ILCS) 2014 findings, some 8.9% of households were involved in external and internal migration processes over the period of 2011-2014. According to the Caucasus Research Resource Center 2012 survey of potential migrants, 36% of people between 18 and 50 years of age in Armenia are seriously considering leaving the country to live or work abroad. At that, most of respondents with household members having migrated to/returned from the Russian Federation or other countries specified the need to work, search for work, or seasonal work as the main reason for migration.

So with this analysis I chose unemployment rate and the monotown condition as determinants of migration. I also include company per capita ratio (registered business companies in the city) which we will use for policy recommendations. Considering all mentioned above the increase in unemployment rate and the monotown condition should increase the level of migration. The vice versa should exist in case of number of companies per capita.

Table 2 Expected signs of the coefficients

Monotown	Positive (+)
Unemployment	Positive (+)
Company per Capita	Negative (-)

The cross sectional data is taken from the Ministry of Territorial Administration for the year 2014 and is the most accurate and precise data available for this project. The number of observations is 48 which is actually the number of cities in Armenia (not including Yerevan).

Table 3 Descriptive Statistics

	Observations	Mean	Standard Deviation	Min	Max
Migration	48	0.0755957	0.0822677	0.18339	0.31074
Unemployment	48	0.4831739	0.2494692	0.32628	0.88793
Company per Capita	48	0.0023648	0.0021829	0.03168	0.10876

The following regression model is used to test the relationship between the level of migration, monotown, companies per capita and unemployment.

$$Migration = \beta_0 + Unemployment\ \beta_1 + CompanyPerCapia\ \beta_3 + e$$

- Migration is the number of people who migrated from the city as percentage of total city population.
- Unemployment is the ratio between the number of unemployed people and total available workforce (people aged 18-63).
- Monotown is a dummy variable. We used our methodology developed in the previous section: more than 20% of employed people should work in the same sector of economy. The calculation were done by the author.
- Company Per Capita shows the ratio between the number of registered companies and total population.
-

Before considering the models we checked on multicollinearity and heteroskedasticity problems. Our test showed that we do not have a multicollinearity and heteroskedasticity problem, as well as the Jarque-Bera test revealed that our data is normally distributed.

Table 3. Regression Results*

	(1)	(2)
Unemployment	0.173*** (0.037)	
Monotown	0.042* (0.017)	0.055** (0.018)
Company per capita	-9.691* (3.945)	
Log unemployment		0.045** (0.013)
Log Company per capita		-0.029* (0.009)
Number of observations	48	48
Adjusted R2	0.556	0.515
Akaike (AIC)	-138.758	-134.523
Schwartz (BIC)	-131.273	-127.038

**Standard errors are in parenthesis. *** p<0.01, ** p<0.05, * p<0.1*

We are considering two models. (1) represents a regression where no variables are transformed. (2) presents a regression where the natural logs of all independent variables except the dummy variable are taken. It is done because we consider that the impact of the variables on migration should become less significant after a specific point. We see from the table that the adjusted R squared is greater and AIC and BIC are smaller for the first model. So we choose the first model as it is the better.

From the results we can conclude that our hypothesis was right and we got the results we expected. The unemployment rate and monotown condition increase the migration rate respectively by 0.17 and 0.04 unit each of them, while the number of opened companies per capita strongly decreases the number of migration by 9.6 unit. This is an interesting finding: it shows that business development is a major factor and can negatively effect on migration.

Policy Recommendations

In general, taking into account the international best practices the ways in which the state can support the development of mono cities can be the optimization of mono cities based on the production capacities of stable functioning enterprises, diversification of the economy and development of small and medium sized enterprises to ensure the optimal structure of the population's employment, development of social and engineering logistics based on the optimal number of the population.

Besides all the above mentioned suggestions, we would like to emphasize the importance of the agricultural development in Armenia. The rural communities included in the urban communities are left out of the agricultural development programs. The production, building and logistical capacities of the former city-like settlements that make up today's mono cities can be integrated with the existing agricultural resources to support the development of the city as a whole throughout the entire value creation chain.

The promotion of agricultural development and the processing of agricultural goods, as well as the creation of a new approach toward utilizing the manufacturing resources will promote the general development of small cities, which in turn will directly impact revenue growth and reduction of poverty and emigration. It is necessary to analyse the small cities that were established during the planned economy on a production – city basis, where the urban development enterprises are currently either partially or completely not functioning. It is advisable to analyse the creation of such mono cities through an integrative approach by integrating the primary agricultural production with the logistical capacities of the urban localities and develop the entire value chain of agricultural production by supporting the creation of agricultural refinement of small and medium sized enterprises. More specifically production and value chain development confirm that by working in multi-settlement small urban communities, great results can be obtained by utilising the resources of the rural localities in the process of primary production and the urban logistics in the process of refinement and marketing, thus promoting the development of small and medium enterprises.

Conclusion

The small cities of Armenia have a huge economic potential if the right decision will be made regarding its development. At first, the problem should be defined: we need a new classification for the RA mono cities. In our paper we defined mono cities as having more than 20% of the workforce employed in one sector of the economy. We showed that being a mono cities increases the migration rate as well as the poverty rate which is logical from economic logic. The enterprise per capita level high ceases the migration level: 1% increase reduces migration by 9.6%. Finally we discussed the agricultural sector development in RA cities. We think that there is a lot of potential in the agricultural sector of Armenia. And this problem can be solved by utilizing the cities industrial power by creating the agricultural refinement enterprises in cities. The full agricultural value chain creation will boost the small cities development.

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PAPER

Issues on Private Foreign Remittances Influence on the Economy

Irina B. Petrosyan

Abstract For the most of developing countries foreign private remittances are not only the most important sources of disposable income forming but also in some cases form more strong channel of foreign currency inflows than participation in the international trade, foreign aid and foreign private investments. Remittances are the form of resource movement from developed countries to developing, significance of which increases every day. They potentially could become a pillar for the development of the financial sector in the recipient country, partly transforming into savings and entering on the financial market through formal credit channels. The study focuses on the main effects created by the foreign remittances and makes an attempt to analyze the short-term and long-term influence on the recipient countries economies.

Keywords Remittances - International migration - Exchange rate – Dutch disease

JEL classification F24

International economic integration is traditionally associated with the growing openness of the goods and services trade as well as with the unprecedented growth of capital flows volume. The integration processes, which take place in the 21st century, are often opposed to the globalization wave, but both of these processes are accompanied with large flows of international migration. It is necessary to mention that the strengthening of international migration flows is the main characteristics of the current globalization stage and the labor movement affects the international economy strongly. As an illustration of this fact we can mention the strong growth of foreign remittances flows to the most of developing countries, which are the main source countries of migrants' flows. The first decade of the 21st century is marked by the increasing role of private remittances in the total international capital flow. For most of the developing countries private remittances represent a significant part of international capital flows, exceeding even incomes from exports, FDI and foreign aid in absolute terms and in a percentage to GDP as well.

Private remittances flows to developing countries have been growing constantly in the recent thirty years and today their volume exceeds 325 billion dollars. As a comparison, in 1975 their volume was 2.9 billion, and in 2003 – about 100 billion. The volume of officially recorded remittances that are directed to the developing countries was larger than the volume

Irina B. Petrosyan (✉)
Department of Economic Theory and the Issues of Transition Period Economies,
Institute of Economics and Business, Russian-Armenian University, Yerevan, Armenia
e-mail: petrosyan.irina@gmail.com

of ODA and was about two thirds of FDI volume. Besides, according to the 2009 data private remittances are about of 2% of the developing countries total GDP.

Foreign remittances are a multifaceted and extensive phenomenon because of their effects on a wide range of macroeconomic indicators. It is interesting that their influence on the recipient country is ambiguous and predetermined by such factors as the poverty level in the recipient country, its' migration policy, monetary policy regime, currency regime, the level of trade relations liberalization and others.

Private remittances have both negative and positive impact on the recipient country economy. Beyond the positive characteristics we can mention first of all, that remittances affect positively population income in the short-run through the increase of the disposable income of the recipient country households. These benefits extend to the whole economy through the multiplier effect, because at least part of remittances are spent on the goods and services produced in the country[1]. According to the assessments that were made during the researches of the countries that are the biggest recipients of foreign remittances, the value of multiplier in these countries varies from 1.24 (research of Bangladesh by Stahl and Habib[2]) to 3.2 (research of Mexico by Adelman and Taylor[3]).

A cross-country analysis also confirms the fact of positive influence of remittances on poverty level lowering. Adams and Page[4] found out that 10% growth of population results in a 1.9% decrease of the population share that live on less than 1 dollar a day. Also they have discovered that 10% growth of remittances per capita leads to a poverty level lowering to 3.5% due to a multiplier effect on the GDP growth[5].

In contrast to other capital flows private remittances are less volatile and cyclical and demonstrate counter-cyclical behavior in the periods of slump. In the periods of world crises their volumes decrease less than volumes of other capital flows and the processes of recovery after crisis are much shorter.

Remittances lead quite easy to an increase of tax incomes of the state budget, increase of reserves in foreign exchange and to short-run economic growth as well.

But, in spite of all the abovementioned positive characteristics, private remittances have a significant negative influence on the recipient country.

First, they decrease recipients' motivation to increase a labor supply. Individual labor supply decreases because of additional income arising from the remittances. Decreasing labor supply leads to an increase of nominal costs of all the firms. In addition, growth of the aggregate demand, rising from the remittances flows, partly goes to non-tradable goods and services consumption, that, in its turn, creates an inflation pressure on the economy. An increased supply of foreign currency as a result of remittances inflow leads to a nominal exchange rate appreciation. Thus, remittances lead to a real exchange rate appreciation, which, in its turn, affects quite negatively competitiveness of exports and results in a Dutch disease of the economy. The Dutch disease impacts all the spheres of economy, leads to distortions both in a real and money sectors, affects negatively the external competitiveness of the country, decreases the economic growth rates.

1 Chami, Ralph, Connel Fullenkamp, and Samir Jahjah. 2003. "Are Immigrant Remittance Flows a Source of Capital for Development?" IMF Working Paper WP/03/189.

2 Stahl, Charles W., and Ahsanul Habib. 1989. "The Impact of Overseas Workers' Remittances on Indigenous Industries: Evidence from Bangladesh." The Developing Economies, Vol. 27. pp. 269–85.

3 Adelman, Irma, and J. Edward Taylor. 1992. "Is structural adjustment with a human face possible? The case of Mexico." Journal of Development Studies, 26. pp. 387-407.

4 Page, John and Adams, Richard H. 2003. "International Migration, Remittances, and Poverty in Developing Countries". World Bank Policy Research Working Paper №.3179.

5 See ref. 4.

Besides, from the point of view of a of number researchers, the Dutch disease arising from the foreign remittances is the most difficult to manage and overcome as initially it is difficult to manage and govern its cause – foreign remittances.

The issue of the long-run influence of remittances of the recipient country still remains open. Long-run impact of private remittances consists of a mixed set of negative (competitiveness losses as a result of the real exchange rate appreciation and increased labor cost, decrease of the human capital stock because of the "brain drain", postponed structural reforms, increase in the external dependency) and positive effects (raised savings, investment in a real and human capital).

Taking into account all the above mentioned, we can conclude that recipient countries faced an important objective of effective management of remittances flows to maximize the benefits from the positive effects and neutralize and minimize negative ones. It means running such economic policy that will stimulate private savings and investment and facilitate the effectiveness of remittances use. It means that individuals who receive remittances should have stimulus to use them to run new businesses, renew human capital by the increasing expenses on public health and education and making savings through the formal financial institutions.

But it will be possible only in the presence of the corresponding investment climate. And as the investment climate includes tax system, labor market regulation, corruption level, economy monopolization level, property rights and contract enforcement, we suppose that the solutions of problems that arise from migration and remittances requires a complex set of activities that will cover all the above mentioned components. Besides, recipient countries have to run an adequate monetary policy and also a policy in the sphere of production which will have an objective to compensate the exporters' competitiveness losses in a consequence of wages growth and real exchange rate appreciation.

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PAPER

Lake Sevan: Environmental Story

Elen Karayan

Abstract Lake Sevan is the largest freshwater lake in Armenia, the largest lake in Trans-Caucasus and one of the largest freshwater lakes in Eurasia. Only one river flows out from the lake, Hrazdan River, which flows toward the Ararat Valley (one of the important croplands in Armenia) and is one of the sources of irrigation for the cropland. But since 1930s, because of lack of energy in the country, Sevan-Hrazdan hydropower cascade was built which was used to generate energy and also was a source of irrigation for the Ararat Valley, which was located in a lower attitude than the lake. Because this water outflow from Lake Sevan had increased dramatically, it lead not only to environmental problems, but also to a loss of cultural value. The bad ecological condition of the lake had influence on the economy of Armenia. As a consequence several steps and policies were undertaken with a purpose to stabilize the environmental condition of Lake Sevan, and one of the steps was the construction of tge Arpa-Sevan tunnel in 1982, which increased the inflow of water into the lake.

Keywords Armenia - Aquaculture - Biodiversity - Ecology - Endangered species Environment - Environmental impact - Environmental regulation Eutrophication - Fishery - Irrigation - Lake Sevan - Natural resource Pollution - Water - Sewage

JEL Classification Q25 - Q22 - Q42 - Q51 - Q53 - Q57 - Q58

The purpose of this narrative essay is to give a brief overview on the environmental story of Lake Sevan, which is the largest lake in Trans-Caucasus and one of the largest freshwater lakes in Eurasia. Its surface was once 1416 km^2 but dropped by 13% and is now 1241 km^2.
Brief characteristics of Lake Sevan:

- Natural soil is mainly black loam,
- Sunshine hours per year are 2400-2800, and are comparable to Egypt
- Annual participation is 340-720 mm
- Length of the lake is 75 km,
- Mean width is 19.2 km
- Largest width is 32 km,
- In history iced once every 15-20 years, but since 1970s iced every year[1]

1 Temperature of Lake Sevan, available at http://www.fao.org/docrep/003/X2614E/x2614e13.htm

Elen Karayan (✉)
BA student in Business at American University of Armenia, Yerevan
e-mail: elen_karayan@edu.aua.am

Water flow into Lake Sevan and out from Lake Sevan:

- Overall 29 rivers and streams flow into Lake Sevan from watershed.
- The river Hrazdan is the only river that flows out from the lake, downstream of Yerevan and through the Ararat valley it flows into Araks River.
- The lake outflow has been regulated for irrigation.
- The Sevan-Hrazdan hydropower cascade is being used since 1930s.[2]

Biodiversity of Lake Sevan:

- 1600 plant species, 48 of which are in the Red Book[3],
- 6 fish species, 2 of which are in the Red Book,
- 210 bird species, 36 of which are in the Red Book,
- and other mammals, reptiles etc[4]

Lake Sevan is located higher attitude than the Ararat Valley (a fertile but at the same time arid cropland). Therefore, the water from the lake could be used for irrigation purposes in the Ararat Valley. Lake Sevan had a large surface. In Soviet times a large surface area meant wasteful evaporation. Thus, in order not to waste the valuable water of Lake Sevan it was decided to start the destruction process of the lake, as it would solve several problems such as irrigation of the Ararat Valley, and lack of power resources. Therefore, since 1933:

the outflow from the Lake Sevan increased for:

- power generation (56% of total national HP)
- irrigation (25% for region and 12% for Ararat Valley)
- 6 hydro-power plants (total capacity 556 MWt) were constructed

By 1960 the ecological condition of the lake was getting worse and worse. In 1964 eutrophication started. [5]

2 Morphometry of Lake Sevan, available at http://www.fao.org/docrep/003/X2614E/x2614e13.htm

3 Flora of Lake Sevan, available at http://enrin.grida.no/htmls/armenia/soe_armenia/english/sevan/sevan/flora.htm

4 Fauna of Lake Sevan, available at http://enrin.grida.no/htmls/armenia/soe_armenia/english/sevan/sevan/fauna.htm

5 Sevan Management Information System (SEMIS): Lake Sevan, available at https://www.uni-hohenheim.de/lake-sevan/sevan_problem.htm

The decrease in the level of Lake Sevan and also the decrease in the quality of its water brought with it several problems, such as

- Loss of irrigations resource
- Loss of hydro-power resource
- Ecosystem instability
- Loss in cultural values

Therefore several areas of the country were affected, such as ecology, tourism, cultural values and economic production.

After realizing the bad environmental condition of Lake Sevan attempts were made in order to recover the level of the lake. In 1982 the Apra-Sevan tunnel was completed which stabilized the level of the lake and brought on average 250 million m^3/year water from the Arpa River.[6] In 1992-1995 due to energy crisis again high level of water releases were made.[7] In 1995 the net inflow became positive. It was estimated that 512 million m^3/year can be taken from the lake still maintaining its level. Therefore, overall 370 million m^3/year was allowed to be taken from the lake (300 million m^3/year for irrigation and 70 million m^3/year for hydro power).

Even though the level of the lake was rising, the quality of the water still had some problems. 37% of phosphorus load and 10% of nitrogen load come from domestic waste, because approximately 210,000 people discharge domestic waste into the lake. Agriculture has its negative influence on the quality of the water as well, because 33% of phosphorus load and 70% of nitrogen load come from fertilizers.[8] Also, another problem was the broken sewer pipeline from Jermuk, as a result of which the sewage dropped into the river flowing into Lake Sevan.
In order to stabilize and improve the quality of water several policies were considered, such as:

- Bill of Principles of Environmental Protection
- United Nations Convention on Climate Change
- Convention on Wetlands of International Importance
- Convention on Biodiversity
- UN Convention to Combat Desertification
- Agreement of Cooperation in the Sphere of Ecology and Environmental Protection
- FAO International Code of Conduct in the Distribution and Use of Pesticides

Plus National regulation and Laws, such as:

- Formulating policy
- Drafting laws and planning their enforcement
- Establishing annual
- Fish catch
- Water release
- Three cutting quotas
- Establishing functional zones in National Park
- Adopting standards and service charges
- Managing state-owned lands
- Issuing water use permits and ecological passports
- Imposing pollution and extraction fees
- Maintaining water and land disasters

6 Sevan Management Information System (SEMIS): Lake Sevan, available at https://www.uni-hohenheim.de/lake-sevan/sevan_problem.htm

7 Lake Sevan: Experience and Lessons learned brief, Table 1. Lake Sevan water balance in different periods (million m^3/year), available at http://www.worldlakes.org/uploads/21_Lake_Sevan_27February2006.pdf

8 Sevan Management Information System (SEMIS): Lake Sevan, available at https://www.uni-hohenheim.de/lake-sevan/sevan_problem.htm

Another problem that still exists and affects biodiversity of Lake Sevan is related to fishing. Historically, Lake Sevan had 4 subspecies of trout, in Armenia mostly known as Ishkhan, (winter bakhtak, bodjak, summer bakhtak and gegharkhouni), 2 types of white-fish, in Armenia known as sig, 2 carp types and barbel.[9] Some of the problems associated with fishing are the following:

- Excessive fishing pressure
- Illegal fishing
- Loss of fish habitats

Of course several policies are enforced to order to meet this problems, but they as well have some issues, such as:

- Difficulty in enforcing licensing system
- Difficulty in controlling illegal fishing especially during a hard economic period

Of course, after all the policies and attempts to increase the level and the quality of water of Lake Sevan the level of the lake increased, which had its impact on the environment.

- In 2004 Vorotan-Arpa tunnel was completed, which brings with it 165 million m^3/year water into the lake[10]
- In 2010 the level of Lake Sevan was 1899m and 23cm[11]
- In 2012 the level of Lake Sevan was 1900m and 13cm

It was predicted that the lake will refill in 30 years, but with its current speed it can take only 15 years. The cleaning of surroundings of the lake was supposed to start in 2007, but because of the rapid growth in the level of the lake it started in 2005. For this reason cleaning efforts were inefficient.

It appears that the level of the lake would continue to rise and everything would be back to normal, but there are other environmental aspects that affect the environmental condition of the lake. Because of climate change the volume of the water inflow into the river is projected to reduce naturally. The projection of the water inflow, A2 the pessimistic scenario, into Lake Sevan by Third National Communication on Climate Change are provided in the table below.

Table 1 The projection of inflows in Arpi reservoir and Lake Sevan according to A2 scenario, milion m^3

Water body	1961-1990	2030	2070	2100
Arpi reservoir	60,15	56,12	51,43	45,47
Lake Sevan	787,00	734,00	673,00	595,00

In 2030 the inflow water into the Lake Sevan will decrease by about 50 million m^3 in comparison to baseline (787 million m^3). In 2070 the inflow water into the Lake Sevan will decrease by about 110 million m^3 and in 2100 by 190 million m^3. Therefore, the water level will decrease by 16 cm annually.

In conclusion, Lake Sevan is a very important part of Armenia. It is one of the cultural values of Armenia and also a source of water and a source of living for people, animals, birds and fishes. The Armenian government is working hard to refill the lake and solve all the problems that arise in a way.

9 Fish and Fisheries in Lake Sevan, Armenia, and in some other high altitude lakes of Caucasus, Fish Fauna of Lake Sevan, available at http://www.fao.org/docrep/003/X2614E/x2614e13.htm

10 Lake Sevan: experience and lessons learned brief, 5. Responses to threats, available at http://www.worldlakes.org/uploads/21_Lake_Sevan_27February2006.pdf

11 Case Lake Sevan- Integrated Environmental Assessment of Lake Sevan (ИНТЕГРАЛЬНАЯ ОЦЕНКА ЭКОЛОГИЧЕСКОГО СОСТОЯНИЯ ОЗЕРА СЕВАН) page 12, Table 4, available at http://www.grida.no/publications/lake-sevan/

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PAPER

The Progressive Tax System and Returns on Educational Investment: The Armenian Case

Avag Avanesyan

Abstract Over the years many researchers have time and again proven that higher taxes, although promoting equality to some extent, hamper economic growth. As to why this happens, there are many theories ranging from incentives to work to human capital depreciation.
Human capital has been put in the center of endogenous growth theories in the last decade. The returns on education were also largely discussed as a way to calculate the efficiency of the educational system in providing workers with higher value added. However, the effects of the tax system in use are usually omitted.

In this article we will discuss the effects of a progressive tax system on higher education. Precisely, on the decision making processes of individuals that are choosing their career path and the specialization.

In the first part we define the notion of human capital and explain the reasoning behind the choice of the private educational investment IRR as the target of study. We then provide the mathematical definition of the returns to education that we will be using to evaluate the said tax effects. Next we briefly review the international literature on the effects of taxation on economic growth. We then modify the optimization equations to reflect the effects of the tax system on the educational IRR. Finally, we discuss the Armenian case and calculate the before and after tax IRRs for the progressive and flat rate tax systems.

We conclude with the follow-up study propositions that arise from the current lack of data in the Armenian job and higher education markets.

Keywords Progressive taxation - Return to education – Investment – human capital

JEL Classification I26 - H24 - I28

Human capital

Capital is usually defined as Items purchased currently that produce benefits in the future. For reasons to be spelled out shortly, education produces monetary and, perhaps, nonmonetary benefits and qualifies as investment in human capital. As the phrase “human capital” suggests, individuals have certain capacities or skills of a cognitive, physical, social, or psychological nature with which they earn a living.

Avag Avanesyan (✉)
Russian-Armenian (Slavonic) University, Yerevan, Armenia
e-mail: a.v.avanesyan@gmail.com

The level of any one skill possessed by an individual is partly determined by genetic inheritances and is partly acquired in the family, from friends, from formal education, and so on. The type of education in which we are primarily interested increases inherited skill levels by developing a person's cognitive and/or affective attainment levels. For example, higher education is capable of teaching a person general facts, the use of specific These costs system and should due strictly to screening Higher education and earnings 26 tools, and general problem-solving techniques. In addition, it can influence a person's behavior by making him more tolerant of diversity, better able to stand stress, a better leader, and more disciplined mentally. All these aspects of cognitive and affective behavior could make a person a more productive and effective worker.[1]

Thus, human capital can be defined as the total of educational spending by the public and private sectors. It is much more important to study the role of the private sector investment and behavioral patterns of investors, as governments are always reluctant to either increase or decrease spending on education, as economic and social effects are taking a relatively long time to manifest. The private sector however does not have the issue of showing results right here and now to appease the general public and is only conserved with increasing returns, be that financial returns or utility returns.

The Human Capital index is based upon 4 main pillars[2]:

- The Education pillar contains indicators relating to quantitative and qualitative aspects of education across primary, secondary and tertiary levels and contains information on both the present workforce as well as the future workforce.
- The Health and Wellness pillar contains indicators relating to a population's physical and mental well– being, from childhood to adulthood.
- The Workforce and Employment pillar is designed to quantify the experience, talent, knowledge and training in a country's working–age population.
- The Enabling Environment pillar captures the legal framework, infrastructure and other factors that enable returns on human capital.

As we can see, only education does not ensure high levels of human capital. However the definitions of the pillars imply that the Education pillar is the only one that is fully dedicated to the creation of human capital. Indeed, we can treat the Health and Wellness pillar as capital maintenance costs. The Workforce Employment pillar does have a capital generation element in it, which is the experience, however the rest of the building blocks of the pillar are indicators of endowment of the country's workforce. Finally Enabling Environment could be called the public good which a firm needs to utilize in order to be able to use capital. For example, if spending on education is buying a truck, then Health and Wellness would be buying parts, fuel and paying for repairs of the truck. Workforce and Employment would be the situation in the market for truck services as well as the initial budget with which we buy the truck, finally Enabling Environment would be a road which a firm would have to use in order to utilize the truck.

Thus if a country wants to generate more human capital, education investment would be the logical way to go. The Solow model relies heavily on measures of human capital to calculate expected economic growth. This is supported by empirical evidence. Gemmell (1996) studying OECD data has found that 1% increase in initial tertiary human stock was associated with a 1.1% increase in per capita GDP. When these OECD results were compared to a wider sample of countries, it was found that primary human capital had the most impact in the poorest group of the less developed countries and secondary human capital was the most significant variable

1 Chapter Title: The Human-Capital Approach to Higher Education Chapter Author: Paul J. Taubman, Terence Wales, 1974

2 Human Capital Index, World Economic Forum 2013

for the intermediate group of less developed countries. Barro (1997), using modified data in panel format and applying more sophisticated estimating techniques, produces a similar set of findings to the earlier paper. An extra year of male upper-level schooling is associated with a 1.2 % increase in per capita GDP growth rate.

As it was already mentioned, currently we are more interested in the behavior of the private sector as regards investments in human capital. Thus we need to evaluate the role that taxation plays for the educational IRR as in turn this measure plays an important role for enrollment and the tertiary human stock. Furthermore, effects of diminishing returns to education might translate into a much higher downturn for economic growth and poverty than just loss of a larger part of income by population with higher education degrees.

Returns on education

The typical human capital theory (Becker, 1964) assumes that education, s, is chosen to maximise the expected present value of the stream of future incomes, up to retirement at date T, net of the costs of education, cs. So, at the optimum s, the PV of the s-th year of schooling just equals the costs of the s-th year of education:

$$\sum_{t=1}^{T-s} \frac{w_s - w_{s-1}}{(1+r_s)^t} = w_{s-1} + c_s$$

where r_s is called the internal rate of return. Optimal investment decision making would imply that one would invest in the s year of schooling if r_s>i, the market rate of interest. Thus we can call the r_s an IRR of education of a sort.

If T is sufficiently large, the equation takes on the following form:

$$\frac{w_s - w_{s-1}}{r_s} = w_{s-1} + c_s$$

In their review Willson and Briscoe (2004) assume that C is small in comparison to sum of wages, thus simplifying the abovementioned equation to a logarithmic one. However, in case of developing countries costs of education usually exceed the opportunity cost of missed wages by far, thus we will abstain from the last steps and use the high C assumption.

Taxation and education

Usually, the studies on returns to education neglect the role that taxes play in wage distribution, thus arriving at higher educational IRR. However, for the person making an educational investment the thing that matters most is the after tax returns, thus if we assume positive returns on education, then the progressive taxation, which is widely proposed as a solution to inequality, may start playing a role.

The progressive tax system usually takes form of a gradual/ladder tax, when different tax rates are applied to incomes that exceed certain level.

We assume that there are 2 steps, for simplicity. Then the optimization function will take the following form

$$\sum_{t=1}^{T-s} \frac{(1-k_2)w_s - (1-k_1)w_{s-1}}{(1+r_s)^t} = (1-k_1)w_{s-1} + c_s$$

Naturally, if T is sufficiently large, we can write

$$\frac{(1-k_2)w_s-(1-k_1)w_{s-1}}{r_s}=(1-k_1)w_{s-1}+c_s$$

Let us denote the initial added wage as and the wage after progressive tax as . It is clear, that under progressive tax assumption , the difference between the higher education wage and the initial wage is larger than in the initial scenario without tax consideration. Naturally, the more progressive the system, the smaller will be the difference.

Thus, we arrive at the following representation of the edu-IRR.

$$\frac{1}{r'_s}=\frac{(1-k_1)w_{s-1}+c_s}{\Delta W};$$

$$\frac{1}{r'_s}=\frac{(1-k_1)w_{s-1}+c_s}{\Delta w}$$

Where ΔW is the added income in case of flat rate tax and Δw is the added income in case of the progressive tax. No complicated computations are needed at this point. It is clear, that higher Δw means IRR, which is precisely what happens, when a progressive tax rate is introduce. Thus by manipulating the progressive and flat tax rates we can arrive at an equivalent of a flat rate tax which will have the same negative IRR effect as the progressive tax system implemented.

Returns to education in Armenia

Armenia has a very high undergraduate education enrollment and completion rates as well as homogenous schooling years' distribution: both in geographical and social terms. The difference comes in undergraduate and graduate schooling years. Even then, every year about 70% of the students choose to continue education in the higher education institution and most of them get accepted. This drives down the returns to education due to abundance of human stock with tertiary degrees.

According to the Armenian law on income tax, persons receiving wages that do not exceed 120 thousand AMD are subject to income tax of 24.4%, while persons receiving wages in the range from 120 to 2000 thousand AMD are subject to the income tax calculated as sum of 29,280 AMD and 26% of the sum exceeding 120 thousand AMD. Finally, persons with wages exceeding to 2000 thousand AMD will have to pay the sum of 518,080 AMD and 36% of the amount exceeding 2 mln AMD.

According to the NSS RA, in 2013 the average monthly income of persons with Complete secondary education amounted to 84,882 AMD per month, the average income of persons that have received higher education has amounted to 108,739 thousand AMD. Assuming, that the 100% of education is coming from wages, we calculate the before tax wage level for persons with higher education- around 144,350AMD, and for person with secondary education- 112,000 AMD. If we take into consideration the decision making process of the individual, that has just recently finished school, we can see that he will most likely be comparing current or last year wages to the expenses that he or she needs to undertake to get the higher education and a higher paying job. On the other hand, this person will be calculating opportunity cost of education as years of income lost. Maturity age in Armenia, is 18, the pension age for men is 65 years. School graduation usually occurs around 18 years old. Thus we assume that an individual will be working for 47 years. We next assume that an individual cannot work while receiving higher education.

According to NSS RA average price of tertiary education in Armenia amounted to about 346 thsd. AMD. In accordance with equation perceived investments in education will amount to 6,771,641 AMD, which is the sum of 4 years of missed wages. The delta W will be 384,000 AMD per year.

Table 1

Unit measure: AMD per year	Delta W	Investment in education	Wage for persons with secondary education
Before tax	384,867	6,771,641	1,347,333
Current system	274,409	5,224,902	960,648

Thus, the expected average IRR with zero taxes would amount to only 5.03%. This implies an extremely low IRR, thus the high rate of employment must be explained by the higher job opportunities for the graduate or extremely low workforce protection and market power. With the official rate of unemployment around 18% both of those explanations might be true.

The current progressive tax system lowers IRR to 4.49% which after we install the values in the abovementioned equation is equivalent to the effect from 28.7% flat rate tax.

It is noteworthy to mention, that the effective tax rate in Armenia is equal to 25.3%. Thus, the flat rate tax with zero educational effect would generate a significantly larger revenue while producing the same negative educational effect as the current progressive system.
Furthermore, it is safe to assume that the lower IRR will cause fewer students to achieve higher education, which will decrease the rate of human capital accumulation and subsequently, growth.

Conclusion and future research

In this article we have discussed the effects of a progressive tax rate on education. We have used the existing definition of internal rate of return on education as well as the definition of human capital for identifying and quantifying those effects. Finally, we used an example of a developing country to show the exact effects and the alternative to the tax system in use that would cause the exact same effect with higher public revenues.

Thus we can conclude that the progressive tax system, although promoting equality and wealth redistribution, is harming the IRR on educational investment as a consequence decreasing the stock of those who desire to achieve higher education and lowering human capital growth rates. Furthermore, the same negative effect is achieved by instituting a flat rate tax that would (under equal conditions) generate much more government revenue that could late be used as for social support and public investments. As our main focus was on Armenia, it is noteworthy that the poverty rate among persons with tertiary education was at 17.6% in 2014 while the poverty rate for persons with secondary education was at 33.6% during the same year. This implies that diminishing returns to education brought by progressive tax system might nudge some of the populace into the decision of not taking higher education, thus pushing them into groups with higher poverty rates.

However, there is a third way to tax higher earning individuals which is considered superior to the income tax, and that is use of various forms of consumption taxation. This however, presents a problem for the evaluation method used in this article, as it implies the need for real wage evaluation and use in the IRR calculations. The problem arises from the fact that the various income groups have different consumer baskets which would imply different levels

of consumption taxation. Finally, we are using averaged data and not considering the job opportunities as a gain which is visible to the populace.

The further steps thus would include:

- Disaggregate the wages and educational investment in accordance with NACE 2 grouping, to arrive at more precise IRR evaluations for different sectors of economy.
- Research and evaluate the effects of consumption taxes on real and perceived educational IRR
- Evaluate the perceived IRR under current conditions, as it might widely differ from the real IRR

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PAPER

Income Distribution Measurement and Regulation in the Globalized World

Ani Avetisyan

Abstract Income inequality is one of the key issues of contemporary economic development in the majority of countries. Some scholars even add it to the list of the four major macroeconomic indicators. Current trends in world economic development indicate that inequality across countries is deepening. Statistics shows that distribution of both income and resources among countries is extremely unequal. However, so far no one has elaborated an optimal approach to the assessment of global inequality. Moreover, specialists have not agreed yet on what should be taken as indicators of income inequality: income, expenditures, resources or opportunities, in their broad sense.

Hence, the research is aimed to assess the level of income polarization on global scale through analysis of a series of relevant studies. In terms of methodology, the author applies to statistical analysis, as well as graphic and regression analyses. Based on results it has been concluded that capital does not move in the same direction as people do. It implies that world economic growth is not inclusive, meaning not all countries have access and opportunity to use economic resources. In this regard, the research findings show that the level of interstate polarization exceeds that within states, which leads to deeper social economic gap between groups of countries, thus gives less opportunities for ones and more opportunities for others. From theoretical perspective, ongoing tendencies of world economy development create challenges, namely the task to look for new ways of assessment and regulation of global income distribution.

Keywords Inequality - Globalization - Income distribution

JEL Classification F6 - Y

Introduction

In most countries income inequality is one of the major challenges for economic development. According to statistics both income and resource inequality in the world is too high and is deepening. Nevertheless, there is still no optimal approach to the assessment of global inequality. In addition, economists have not come to a compromise over what should be taken as indicators of income inequality: income, expenditures, resources or opportunities.

Difficulties with analysis of income distribution are also related to several methodological issues concerning the very understanding and way of calculation of inequality. For instance,

Ani Avetisyan (✉)
Department of Economic Theory and the Issues of Transition Period Economies,
Institute of Economics and Business, Russian-Armenian University, Yerevan, Armenia
e-mail: avetisian.ani@gmail.com

in some African and Asian countries the level of income inequality is calculated as ratio of household spending without taking into account that higher income may boost the saving rate, which means that consumption level remains the same.

In regard to indicators of income inequality, the most common one is household disposable income comprised of household members' salaries, capital income and remittances. Based on the statistics on the level of income, the following coefficients are calculated:

- GINI Coefficient
- Theil Index;
- Atkinson Index.

Apart from those, there are other measures of income distribution, namely quintiles and deciles. They count total income share distributed between the richest and the poorest 10% and 20% of population.

At first glance, it seems that the level of income distribution can be measured by comparison of countries' share of the world population with their share of the world GNI. Aggregate data on per capita income also helps calculate global income inequality. In this regard, average GDP per capita growth compared with that of previous years in some groups of countries gives valuable findings. Nevertheless, as the ways of global income distribution assessment are fraught with ambiguity, more detailed ways of calculation are needed. In the framework of this study the author analyzes the following concepts of inequality measurement:

- Interstate inequality measured based on GDP per capita, PPP.
- Weighted interstate inequality, based on the previous concept and taking into account population of countries.
- Global inequality measured through average per capita income.

As there is too little data required for the third way of management, this study applies to the first two measurements.

Given all shortcomings related to calculation and assessment of income inequality, this research is aimed to contribute to the field by analyzing a series of relevant studies to assess the level of global income polarization through statistical, graphic and regression analyses.

Theoretical approaches

In terms of theoretical framework of income inequality, for a long period of time the neoclassical distribution theory was the prevailing view, but starting from the world economic crisis 2007-2008 it has changed. The nature of the global income inequality has modified: it is already not only intrastate, but interstate as well. Although the number of poor countries has reduced, the income gap between rich and poor countries is increasing: the poor in rich countries are getting richer than the rich in poor countries.[1] According to Piketty, inequality is one of the principal elements of capitalism.[2] Actually, there cannot be income equality, as countries have different competitive advantages. Moreover, they differ in disposable income, which is conditioned by the number of households, income level, expenditure pattern, etc. For instance, Deaton states [3] that at the microeconomic level the difference between developing and developed countries is that the households in the former are much larger and poor. In addition, as different generations of such families traditionally live together, household members save not for old age, but to have income

1 Hrant Bagratyan, and Irina Kravchenko, *Introduction into Megaeconomics: Theory, Methodology, and Practice.* (UBD NBU 2012).

2 Thomas Piketty, *Capital in the Twenty-First Century* (Harvard University Press, 2014), https://www.google.com/books?hl=ru&lr=&id=T8zuAgAAQBAJ&oi=fnd&pg=PR5&dq=.+Capital+in+the+twenty-first+century.+&ots=ZiQCDlXzDl&sig=kVGQYrPnulBpptExtyJleyJe9Ic.

3 Angus Deaton, "Saving in Developing Countries: Theory and Review," *The World Bank Economic Review* 3, no. suppl 1 (1989): 61.

in the times of low productivity, or to distribute income among generations. Savings are given to the disabled members of a family, and properties are inherited. Being perceived as a moral duty, circulation of resources within a family guarantees survival in the cases of disability or illness. As the guarantee is quite strong, such households live long, which creates such a phenomenon as a "consumer dynasty." The majority of the households in developing countries are engaged in agriculture or relevant spheres, which makes it difficult to predict and calculate the flow of their future earnings. As a result, such households are risk-averse, which influences their consumer behavior, thus overall income distribution throughout time. Supporters of globalization claim that liberalization of trade relations and increasing economic openness of countries will equalize costs (including those of factors of production) throughout countries and will provide equal access to resources. It should be mentioned that during the last thirty years there was another pattern contradicting the neoclassical models of economic growth. In the long-run the capital-labor ratio is constant (the labor share of total output constitutes 2/3, and the capital share is 1/3 respectively; accordingly, salary fund and profit are distributed in the same way).[4] In contrast, since the 1980s statistics has revealed a tendency towards reduction in the wage share in total income, which has encouraged new research done by Atkinson, Guerrero, Gollin, etc.[5] Some authors argue that the tendency mentioned above is the consequence of technological progress that has induced capital income growth. Simultaneously, the share of wage is determined by the following factors:[6]

- geographical location that creates favorable conditions for equalization of labor income shares in neighboring countries;
- economic policy aimed at labor income convergence;
- international trade and world costs: labor income share is countercyclical, which is compatible with the theory of Kaldor and Goodwin;
- institutional framework.

However, globalization has modified the factors influencing labor income share: now reduction in labor income share is more often conditioned by increased mobility of labor force. Increase in labor supply due to migration flows in developed countries leads to reduction in labor costs.[7] On the other hand, reduction in labor income share implies increase in entrepreneurs' profit, which along with technological progress contributes to a higher productivity rate, thus larger labor income share. Overall, there are several questions concerning income inequality, which deserve more detailed study,[8] yet, there is little analysis of income inequality and inequality in access to education and healthcare.[9] The matter is that there are difficulties related to measurement and

4 United Nations Conference on Trade and Development, "Trade and Development Report, 2012" (United Nations, n.d.), 4; Anthony B. Atkinson, "Factor Shares: The Principal Problem of Political Economy?," *Oxford Review of Economic Policy* 25, no. 1 (2009): 46.

5 Atkinson, "Factor Shares"; Marta Guerriero, "The Labour Share of Income around the World. Evidence from a Panel Dataset," *Development Economics and Public Policy Working Paper* 32 (2012): 2012; Douglas Gollin, "Getting Income Shares Right," *Journal of Political Economy* 110, no. 2 (2002): 458–474.

6 Olivier Giovannoni, "Functional Distribution of Income, Inequality and the Incidence of Poverty: Stylized Facts and the Role of Macroeconomic Policy," *The University of Texas Inequality Project Working Paper*, no. 58 (2010): 17, http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.459.1842&rep=rep1&type=pdf.\\uc0\\u8221{} {\\i{}The University of Texas Inequality Project Working Paper}, no. 58 (2010

7 Joakim Ruist and Arne Bigsten, "Wage Effects of Labour Migration with International Capital Mobility," *The World Economy* 36, no. 1 (2013): 31–47; Philip L. Martin, *Migrants in the Global Labor Market* (Global Commission on International Migration, 2005), 13, http://www.iom.int/jahia/webdav/site/myjahiasite/shared/shared/mainsite/policy_and_research/gcim/tp/TP1.pdf.

8 Ani G. Avetisyan, "On Some Theoretical Approaches to Income Inequality." Humanities and Social Sciences/ RAU Herald , № 2(20). – Yerevan.: Ed. RAU, 2015: 81-88, 148.

9 Ms Era Dabla-Norris et al., *Causes and Consequences of Income Inequality: A Global Perspective*

assessment of inequality, which one faces already at intrastate level. For instance, labor share is calculated as ratio of total labor costs and total income and includes not only salary, but all the types of rewards, bonuses, etc., paid by employers to their employees. Yet, the indicator does not count income of the self-employed, whereas it constitutes quite a large share in developing countries. As income of self-employed may be ascribed to capital and labor income, use of such an income inequality measurement and assessment tool may give inaccurate results. Measurement of labor share requires precise calculation of total income, from which the number of output and import, as well as indirect taxes should be extracted. Thus, the most popular way of calculation of labor share in income distribution is ratio of total labor costs and total value added without indirect taxes and price of consumption of fixed capital. The other way of calculation is based on the same ratio along with income of self-employed.[10] It is worth mentioning that difficulties with analysis of income distribution are conditioned by several methodological issues concerning the very definition of "inequality." For example, in several countries in Africa and Southeast Asia the level of income inequality is calculated as ratio of household spending without taking into account that higher income may be accompanied by higher saving rate, which means that consumption level remains intact.[11] In addition, household size varies according to the levels of economic development of countries, which influences expenditure pattern: under scale effect per capita utility expenditure decreases.

The common indicator used in income distribution measurement is household disposable income comprised of household members' salaries, capital income and remittances (excluding taxes). Based on the statistics on the level of income, the following well-known coefficients describing the level of polarization are usually calculated:

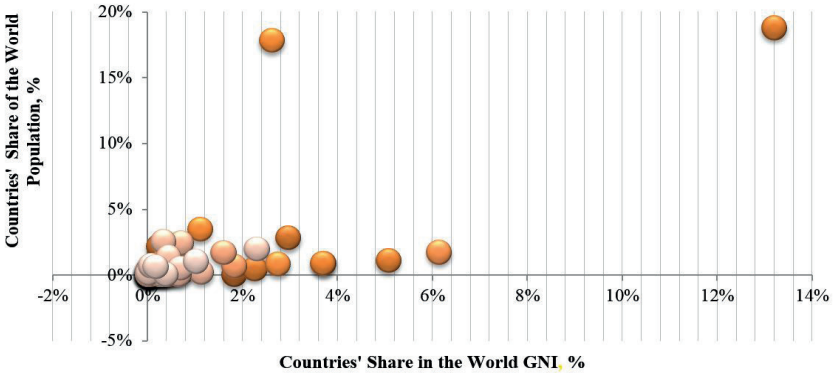
- GINI Coefficient
- Theil Index;
- Atkinson Index.

Apart from those, there are other measures of income distribution, namely quintiles and deciles. They count total income share distributed between the richest and the poorest 10% and 20% of population.

Income Distribution in the Globalized World: Findings and Data Analysis

At first glance, it seems that the level of income distribution can be measured by comparison of countries' share of the world population with their share of the world GNI (see Figure 1).

Figure 1 Countries' GNI and Population Share in the World, % (including India and China)



Source: Calculated using data from World Bank, *http://data.worldbank.org/*

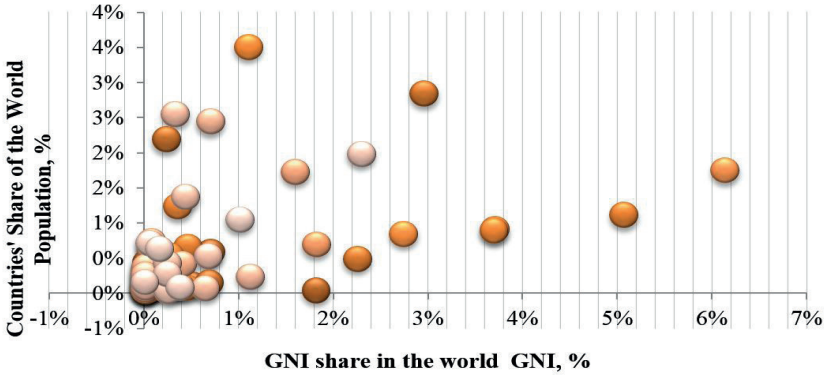
(International Monetary Fund, 2015).

10 Guerriero, "The Labour Share of Income around the World. Evidence from a Panel Dataset," 8.

11 United Nations Conference on Trade and Development, "Trade and Development Report, 2012," 45.

Though the fact that data on India and China is also observed distorts the overall pattern of income distribution in the world because of their large population, their examples illustrate inequality best. These two countries have almost the same size of population, but different shares in the world income: given its GNI, China is five times richer than India; meanwhile, in terms of GDP per capita based on purchasing power parity (PPP), China's indicator is only a little more than twice as high as that of India. The gap is explained by involvement of the economies in value creation, i.e. by factor productivity. Having omitted these two countries from analysis (see Figure 2), it turns out that income distribution among the majority of states is also unequal: countries with larger population (accordingly, larger labor force) have access to smaller share of the world gross income.

Figure 2. Countries' GNI and their share of the world population, % (except for India and China)



Source: Calculated using data from World Bank, *http://data.worldbank.org/*

Aggregate data on per capita income also witnesses global income inequality. In this regard, average GDP per capita growth compared with that of previous years in some groups of countries gives valuable findings.[12] Dynamics of the indicator shows unequal per capita income growth in several regions, and growth is higher in Asia and in the post-Soviet countries (including India and China). Low but constantly positive growth has been revealed in Western countries, as Maddison has classified them (in US, Canada, New Zealand and Australia, and Western Europe). In accordance with this statistics, growth of world economy does not have the same speed throughout countries, which implies unequal distribution of the outcomes of economic activities, which, according to many authors, brings about unequal access to opportunities.

Nevertheless, as the ways of global income distribution assessment are fraught with ambiguity, more detailed ways of calculation are needed.

In the framework of this research the following concepts of inequality measurement are analyzed:[13]

- Interstate inequality measured based on GDP per capita, PPP. In this case countries are considered as measurement units, like individuals in the case of intrastate inequality.
- Weighted interstate inequality, based on the previous concept and taking into account population of countries.

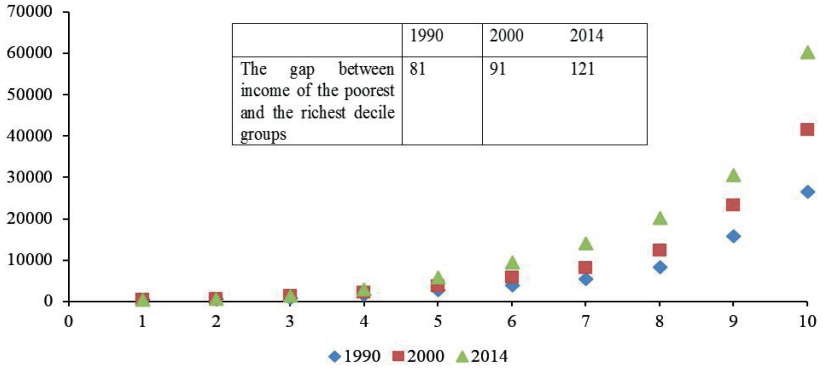
12 See *data from the Maddison Project Database, http://www.ggdc.net/maddison/maddison-project/data.htm*

13 Thomas Goda, "Changes in Income Inequality from a Global Perspective: An Overview," *Post Keynesian Economics Study Group Working Paper* 1303 (2013): 3, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2486888."plainCitation":"Thomas Goda, "Changes in Income Inequality from a Global Perspective: An Overview," Post Keynesian Economics Study Group Working Paper 1303 (2013

- Global inequality measured through average per capita income. The data on the latter is usually gathered through secondary quantitative data, namely household surveys and statistics on national accounts.

Since the data required for the third way of management is scarce, this study applies to the first two measurements. The statistical analysis based on the first methodology (see Figure 4) has shown that during the last 25 years the gap between the richest and the poorest 10% of population in the countries ranked in accordance with their GDP per capita (PPP) significantly increased. Moreover, during last 15 years interstate inequality increased much faster than 10 years before that.

Figure 3 Income Distribution per Decile Groups, by GDP per capita, PPP, 2014

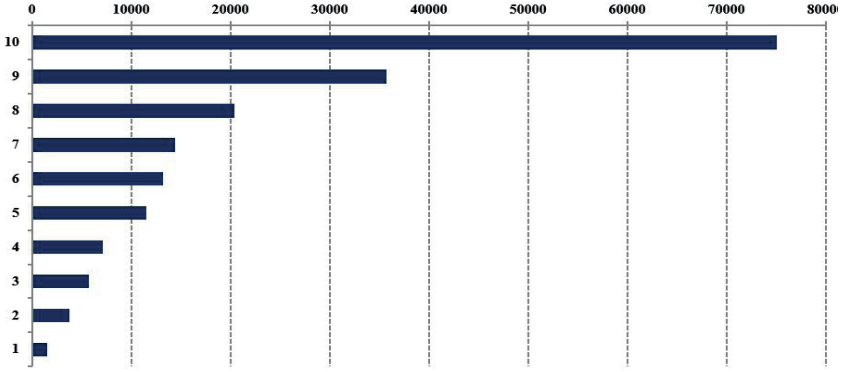


	1990	2000	2014
The gap between income of the poorest and the richest decile groups	81	91	121

Source: Calculated using data from World Bank, *http://data.worldbank.org*

As statistical analysis based on the second way of measurement also counts the population of countries, it turns out that the level of income inequality decreases, and the ranking of countries according to decile groups also changes (see Figure 5). For instance, according to GDP per capita (PPP) and given population size, 10% of the richest countries are those having mainly resource-driven economies and extensive economic growth, along with the USA, Singapore, Ireland, and Switzerland.

Figure 4 Decile Groups by Countries' GDP per capita (PPP) and Population



Source: Calculated using data from World Bank, *http://data.worldbank.org*

Interestingly, India and China are in the middle of the decile group, even though their populations are the largest ones. In terms of extensive economic growth, these countries are leading, yet, they

still are not able to maintain sustainable development. Apparently, these states are out of scope when one looks at average income per 1% and 5% of the poorest countries, which reveals even more inequality (see Figure 6).

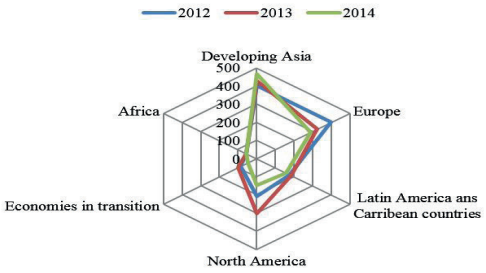
Figure 6 Average Income of the poorest and the richest 1% and 5% of population ranked by GDP per capita, PPP (USD)

Source: Calculated using data from World Bank, *http://data.worldbank.org/indicator*

The majority of the richest countries are resource-driven Arab economies, USA, Norway, Singapore, etc., and, not surprisingly, the majority of the poorest are African states.

Global inequality analysis implies also research on investments flows as one of the factors of economic growth. Regional aggregate statistics shows that, in terms of investments, the leaders are the developing countries in Asia (see Figure 7).

Figure 7 Investment Flow, bln USD



Source: Calculated using data from the World Investment Report 2015

The analysis of the findings reveals that countries with large populations, thus having competitive advantage in terms of labor factor, attract investments as a factor of capital growth. In such a way they contribute to added value creation on global scale, however, their share in world income distribution is lower than that in its creation. The expanded list of countries involved in investment flows movement is shown in the Table 1.

Table 1 The Main Directions of Investment Flows*

Investment Flows: top-20 recipients	Investment Outflow: top-20 investors	Counries' share in the World GNI: top-20
China	USA	USA
Hong Kong	Hong Kong	China
USA	China	Japan

Investment Flows: top-20 recipients	Investment Outflow: top-20 investors	Counries' share in the World GNI: top-20
Great Britain	Japan	Germany
Singapore	Germany	France
Brazil	Russia	Great Britain
Canada	Canada	Brazil
Australia	France	Italy
India	Netherlands	India
Netherlands	Singapore	Russia
Chile	Ireland	Canada
Spain	Spain	South Korea
Mexico	South Korea	Australia
Indonesia	Italy	Mexico
Switzerland	Norway	Netherlands
Russia	Switzerland	Indonesia
Finland	Malaysia	Turkey
Colombia	Kuwait	Sweden
France	Chile	Argentina
Poland	Taiwan	Belgium

Developing countries are highlighted.

Source: Calculated using data from the UNCTAD World Investment Report 2015 and World Bank

It indicates that mostly capital moves to developing countries, which, as a rule, have a large population, but a small share in income distribution. This pattern proves that on the global scale capital is concentrated in the hands of limited number of developed countries. In this regard, global migration is a relevant issue, as it is one of the consequences of inequality (see the Table 2).[14]

Table 2 The Four Directions of the Largest Five Migration Corridors (the World Bank Classification, 2013)

South – North		North – North	
Investors	**Recipients**	**Investors**	**Recipients**
Mexico	USA	Germany	USA
Turkey	Germany	Great Britain	Australia
China	USA	Canada	USA
Philippines	USA	South Korea	USA
India	USA	Great Britain	USA
North – South		**South – South**	

14 Martin, *Migrants in the Global Labor Market*; Richard Black, Claudia Natali, and Jessica Skinner, "Migration and Inequality," 2005; "Sustainable Development Goals: 17 Goals to Transform Our World," *United Nations*, accessed May 23, 2016, http://www.un.org/sustainabledevelopment/.

Investors	Recipients	Investors	Recipients
USA	Mexico	Ukraine	Russia
Germany	Turkey	Russia	Ukraine
USA	South Africa	Bangladesh	India
Portugal	Brazil	Kazakhstan	Russia
Italy	Argentina	Afghanistan	Pakistan

Source: Calculated using data from the International Labor Organization World Migration report 2013, p.62

The USA is one of the main destinations of emigrants, which means that labor force movement has different direction than capital movement. This contradiction confirms that world economic growth is not inclusive and the level of polarization is increasingly determined by geographical location of countries.[15] Therefore, in the framework of sustainable development the UN has pointed out 10 steps of regulation of interstate income distribution. The steps should be implemented by 2030 through special arrangements in the framework of economic and social policies within states.[16]

In conclusion, ongoing tendencies of world economy development create challenges for theory of economy, namely the task to look for new ways of assessment and regulation of global income distribution. It is getting clear that the level of interstate polarization exceeds that within states even 10 times, which leads to deeper social economic gap between groups of countries, thus gives less opportunities for ones and more opportunities for others.

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15 Brsatnko Milanovic, "Global Income Inequality: The Past Two Centuries and Implications for 21st Century," *Powerpoint Presentation, World Bank, Washington, DC*, 2011.
16 "Sustainable Development Goals."

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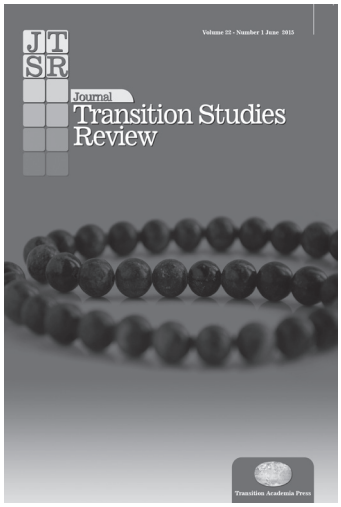

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Aims and scope

Transition Studies Research Network was founded in 2002 as CEEUN-Central Eastern European University Cooperation, with the aim to connect a group of experts and university faculty in a program of cooperation devoted to research programs and specialized international postgraduate and doctoral courses. The Network has grown fast and soon after the scientific "voice" was established with the Journal Transition Studies Review, published initially by the CEEUN, then by Egea - Bocconi University Press, and finally by Springer Wien-New York.

At the beginning, JTSR was focusing on transition in Central and Southeast Europe, interpreting CEEUN purely as a European network. Soon afterwards, the EU enlargement was achieved extending the aims and scope to differentiated forms of partnership with Russia, Ukraine, Caucasus, the Black Sea and Caspian Seas, Mediterranean regions and Near East. Today this approach has dramatically changed following a serious violation of the international laws and agreements by the Russian backed insurgency and later invasion of Crimea and Eastern Ukraine. Today we are facing the most severe crisis of security and confidence between European Union countries and Russia since the Second World War and the reunification of Germany. The future is unpredictable and certainly nothing will return to be as before in the relations with Russia.

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