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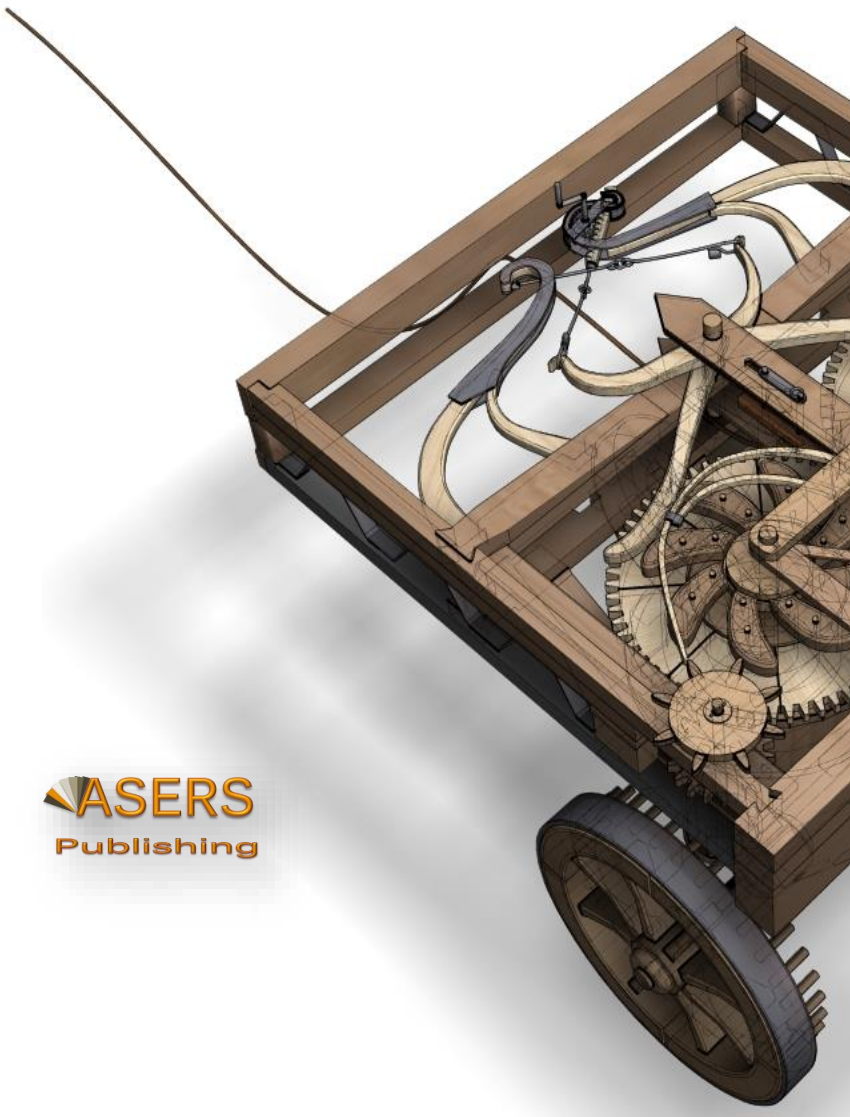

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A NEW KEYNESIAN FRAMEWORK FOR MONETARY POLICY ANALYSIS IN IRAN'S ECONOMY.A DYNAMIC STOCHASTIC GENERAL EQUILIBRIUM APPROACH

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Abstract:

This paper focuses on New Keynesian framework for monetary policy analysis of Iran. It considers a dynamic stochastic general equilibrium (DSGE) models. This article expands a sensitivity analysis of the optimal rules to deep structural parameters and investigating properties of an optimal simple rule with respect to prevailing type of shocks which is the main purpose of the article. Finally, the study highlights how an optimal policy rule depends on model structure, on the model calibration and nominal rigidities.

According to the research findings, based on the theoretical expectations, the effect of a positive shock inflicted on the government investment leads to an increase and gradual accumulation of fixed capital formation in the public sector. Among estimated parameters, consumption is the first affected and reduces, then employment increases consequently, finally production will also be affected. Also with the shock of oil revenues, increased oil revenues which results in public investment at first, because of the increase in oil revenues, the government enhances development expenditure. Though, increase in development expenditure is more than increase in current expenditure. Enhancing development expenditure & construction spending causes total spending increase. As a result of increased production of oil income, consumption and total investment will rise. This leads to inflation too

Keywords: monetary policy analysis, new Keynesian approach, Bayesian estimation.

JEL Classification: E12, E52, E58, E61, O53.

1. Introduction

Accordingly, and with the development of the theoretical implications of this discussion, a large number of researchers' attempts to understand the connection between monetary policy, inflation and business cycles have led to the development of a framework which is Called New Keynesian (NK) model which widely used for the analysis of monetary policy. These new models, combine Keynesian principles (imperfect competition and lack of nominal flexibility) with a dynamic general equilibrium framework that was already largely dependent on real business cycle (RBC) model. These models can be used to analyze the relationship between money, inflation and business cycles and assessing the utility of alternative monetary policy. (Benchimol 2011)

In this article I use the simple monetary rule. The main objective is to discover a set of regularities that describe the optimal properties or characteristics of a simple optimal rule in which the central bank faces data information uncertainty. For this purpose I use Calvo pricing with indexation to induce sticky domestic prices. With a domestic economy of this type and facing a number of domestic and external shocks and also the economy is assumed to have a welfare maximizing central bank.

2. Literature review

N.K school of thought developed by economists like Tobin and Modigliani (Snowdon 2005). They tried to achieve Keynesian economics results by providing microeconomic foundations for Keynesian theories and applying classical assumptions. N.K economics and original Keynesian economics are different in some cases. while Keynesian macroeconomic theory had been generally presented without microeconomic foundations. N.K built their macroeconomic theories based on microeconomics foundations (Ibid). Considering that the new classical general equilibrium models, with regard to the supposed neutrality of money in the economy, fiscal authority behaviour and monetary policies in the model were not defined and the dynamics of the economy were examined only in the form of macroeconomic variables reactions to real shocks. Though these models were criticized by macroeconomists from this view (Christiano *et al.* 2005)

Following this criticisms, a group of economists tried to keep the positive aspects of these models, including the emphasis on rational expectations, microeconomic foundations and optimized behaviour of economic agents and attempted to expand and to generalize new classical general equilibrium patterns by adding monopolistic competition structures and nominal and real bonds so that the impact of economic policies and demand-side shocks could be analysed and explained. These patterns became well-known as patterns of dynamic stochastic general equilibrium (DSGE) and also are powerful tools for monetary policy (MP) analysis and practice forecasting. As Good friend and King (1997) mentioned major conclusions of monetary policy role in New Keynesian models: (i) MP action on the real economic activity may persist over several years, (ii) there is a long-run neutrality of money (iii) NK suggest significant gains from eliminating inflation which stem from increased transaction efficiency and reduced relative price distortions (iv) MP credibility plays an important role (Polansky 2013)

DSGE model is relatively new model including a special advantages compared to other competing models such as input-output models, social accounting matrix and applied general equilibrium. Among the most important features of this model the dynamics of the economy, considering the shocks and random effects, the expectations and the principles of individual optimization are remarkable. Although in these patterns different types of faults and adhesions in commodity markets and factors of production and finance, along with a wide range of random disturbances are explained and clarified but the new generation of DSGE models are applied successfully as possible in order to clarify the normal issues in optimal policymaking. (Semko 2013)

Given the importance of the mentioned characteristics and limitations of competing models such as the input-output data, social accounting matrix, and vector auto regression and general equilibrium in using all of them, DSGE models have advantages compared to other models in the policymaking.

Based on the above mentioned, the literature review suggests a different approach in monetary policy analysis through NK framework. For example Kalman (2002), has done a calibrated utility of the consumer and the percentage change in consumption as the effect on welfare.

Edge and others (2007) in their study entitled "welfare maximization of monetary policy under uncertainty," Using Dynamic Stochastic General Equilibrium (DSGE) has assessed the uncertainty situation that America's central bank (the FED) is facing.

Moreover, the central bank loss function, interest rates and economic growth have been explained in a dynamic economic situation. At the same time the standards and rules performance of monetary policy replacement have been analysed. In this studyusing known parameters have indicated that the optimal policy under uncertainty shows little reaction to normal rates situations such as price and wage inflation.

Malyzewfski research for the International Monetary Fund (2009) under the title of: "monetary policy rules for oil- producing countries, welfare-based approach" considers a numerical simulation for different rules on fiscal a monetary policy. (Malyzewfski 2009)

The welfare implications are critical to the social welfare function in terms of wealth distribution in non-oil and non-oil-dependent landscape. In this section it is assumed that the Petroleum permanent income (oil and financial wealth-producing countries) are kept at a constant level and the private sector is not included in this study.In addition, due to some specific features of Iran's economy, including lack of access to some statistical data or the lack of certainty to some statistics, insufficient studies to extract the exact amount some required structural parameters in macro modelling and high rate of shock accepting of Iran's economy due to exogenous oil dependence, dynamic stochastic general equilibrium models have unique advantages than other competitor models.

With this description, limited studies done in Iran's economy applying DSGE models confirm some of the above points and the results of those studies indicate the reliability of these models to assess the impact of policies and shocks on Iran's macroeconomic variables. The relation is introduced in this study for explanation of monetary policy making in Iran's economy determines the growth rate of the monetary base in order to provide the raise of economic activities and the preservation of prices stability. In this regard, the monetary growth rate is determined in the way that the production deviation of potential production (output gap) and the deviation of inflation from the inflation target will be minimized. But the point that the inflation target in Iran's economy is not a specific amount and implicitly determined by monetary policy maker, is obvious.

In the macro-economic models and specifically the most dynamic stochastic general equilibrium models the preferences expressed by King, Plosser and Rebelo (1978) is used to clarify the utility function. In this method the economy is assumed to include many of the same subjects that have an infinite life and money in the family utility function as follows.

3. The research method

This research is done with a N.K approach using DSGE model. In general, a simple N.K monetary model focuses mainly on trade policy between inflation and the output gap reduction. One of the policy objectives of such an approach is to minimize the deviation from nominal sticky prices which leads to resources inefficiency. The major and important difference between the simplest version of the closed economy and macroeconomic models of the open economy is inconsistency (Engel 2013). As Walsh (2003) and others have argued, the standard Keynesian approach to monetary policy analysis prior to the early 1990s combined the assumption of nominal price with a simple structure for linking the quantity of money to aggregate spending. To address this issue a new type of model is developed and popularized by Good friend and King (1997), Rotemberg and Woodford (1997), McCallum and Nelson (2010), Clarida, Gali and Gertler (1999, 2001), Svensson (2009). The new model is now constructed on the optimizing behaviour of agents and is often referred to as N.K models, which has become the workhorse of Keynesian Analysis. An extensive coverage of approximation techniques and solution method for DSGE models can be found in DeJong and Dave (2007), Canova & Luca (2009) and McCandless (2008).

The research model of the study comes as follows.

4. Description of Model

Representative Household[1]

The model assumes that there is money in the utility function of households. Assuming that all households are similar, the representative sample of households seeks to maximize the expected of the discounted sum of time separable utilities subject to an inter temporal budget constraint. Suppose then that total expected utility can be denoted as:

$$u\left(c_t,\frac{M_t}{p_t},N_t,x_{1t},G_t,E_t\right)=\frac{x_{1t}}{1-\sigma}\left(C_tG_t^{\gamma}\right)^{1-\sigma}+\frac{1}{1-\varsigma}\left(\frac{M_t}{p_t}\right)^{1-\varsigma}-\frac{1}{1+\mu}\int_0^1(N_t(i))^{1+\mu}di-\frac{1}{1+\xi}\int_0^1(E_t(i))^{1+\xi}di \quad (1)$$

Where C_t is the composite bundle of consumption goods, M_t / P_t is the level of real money balances held by the household, and I_t is investments, N_t is proportion of household time devoted to the labour market(so that 1-N_t the proportion of time enjoyed as leisure by representative household). Following Woodford (2003) We assume that each of the differentiated good is produced with a specialized type of labour and that the representative

[1] Household behaviour constructed based on Walsh 2003, Gali 2008, Lou 2009, Turik 2009, Rohe 2012.

household supplies each type of specialized labor, in this case, $N_t = \int_0^1 (N_t(i))di$ where N_t is the quantity of labour of type i supplied by the household. And also E_t.

Is the number of entrepreneurs, B_t is bonds, as well as $\frac{1}{\sigma} \geq 0$, $\frac{1}{\varsigma} \geq 0$, $\frac{1}{\mu} \geq 0$, $\frac{1}{\xi} \geq 0$ in order are the elasticity inter temporal substitution for consumption, elasticity of real money holding, elasticity of Frisch labour supply, elasticity of entrepreneurship. Hence in real terms, the representative household's budget constraint can be written as,

$$C_t + I_t + \frac{M_t}{p_t} + \frac{B_t}{p_t} + \frac{T_t}{p_t} \leq \frac{W_t^N}{P} N_t + \frac{W_t^E}{P} E_t + \Pi_t + R_{t-1} K_{t-1} + (1 + r_{t-1}) \frac{B_{t-1}}{P} + \frac{M_{t-1}}{P} \tag{2}$$

Where M_t is the level of money holdings chosen for the end of period t, B_t is the level of bond at the end of period t, W_t^N the representative is modelled as receiving a nominal wage rate for each unit of type ilabor provided, the household is subject to a lump-sum tax levied by the government. W_t^E is a nominal wage rate for each unit of type i entrepreneur provided, R_{t-1} the real rate of rent chosen for the end of period t-1, P_t Is the level of public prices, Π_t is manufacturing enterprises distributed profit and σ is private capital depreciation rate. Also we have law motion of investment as below:

$$K_t = (1-\sigma) K_{t-1} + I_t$$

Dynamic programming is used to solve the household's problem thus the maximization in (1) is subject to the budget constraint (2). So we have the first order condition for an internal optimum for $C_t, M_t, N_t, K_t, E_t, \frac{B_t}{p_t}$.

$$\max_{C_t, M_t, N_t, K_t, E_t, \frac{B_t}{p_t}, \lambda_t} \Gamma_t = E_t \sum_{t=0}^{\infty} \beta' \left\{ \begin{array}{l} \frac{x_{1t}}{1-\sigma} \left(C_t G_t^{\gamma} \right)^{1-\sigma} + \frac{\varpi}{1-\varsigma} \left(\frac{M_t}{p_t} \right)^{1-\varsigma} - \frac{1}{1+\mu} \int_0^1 (N_t(i))^{1+\mu} di - \frac{1}{1+\xi} \int_0^1 (e_t(i))^{1+\xi} di + \\ \lambda_t \left[W_t^N N_t + W_t^e e_t + \Pi_t + R_{t-1} K_{t-1} + (1 + r_{t-1}) \frac{B_{t-1}}{P} + \frac{M_{t-1}}{P} - C_t - I_t - \frac{M_t}{p_t} - \frac{B_t}{p_t} - \frac{T_t}{p_t} \leq \right] \end{array} \right\} \tag{3}$$

$$\frac{\partial \Gamma_t}{\partial C_t} = G_t^{\gamma} (C_t G_t^{\gamma})^{-\sigma} - \lambda_t = 0 \tag{4}$$

$$\frac{\partial \Gamma_t}{\partial N_t} = -x N_t^{\mu} + \lambda_t w_t^N = 0 \tag{5}$$

$$\frac{\partial \Gamma_t}{\partial e_t} = -x e_t^{\xi} + \lambda_t w_t^e = 0 \tag{6}$$

$$\frac{\partial \Gamma_t}{\partial \left(\frac{M_t}{p_t} \right)} = \varpi \left(\frac{M_t}{p_t} \right)^{-\varsigma} - \lambda_t + \beta E_t \frac{\lambda_{t+1}}{\pi_{t+1}} = 0 \tag{7}$$

$$\frac{\partial \Gamma_t}{\partial K_t} = \beta E_t \lambda_{t+1} (R_t + 1 - \sigma)) - \lambda_t = 0 \tag{8}$$

$$\frac{\partial \Gamma_t}{\partial \left(\frac{B_t}{p_t} \right)_t} = \beta E_t \frac{\lambda_{t+1} (1 + r_t)}{\pi_{t+1}} - \lambda_t = 0 \tag{9}$$

The combination of relantion (5), (8), and (10) we have demand equation for real balance (11), a combination of relantion (5) and (6) labour supply equation (12), a combination of relations (5) and (7) entrepreneur labour supply equation (13), a combination of relantions (5) and (10) the relationship between the rate of return on bonds and capital lease rate, we will achieve.

$$\varpi\left(\frac{M_t}{p_t}\right)^{-\varsigma}=\left(\frac{r_t}{1+r_t}\right)G_t^{\gamma}(C_tG_t^{\gamma})^{-\sigma} \tag{10}$$

$$\chi\frac{N_t^{\mu}}{G_t^{\gamma}(C_tG_t^{\gamma})^{-\sigma}}=w_t^N \tag{11}$$

$$\chi\frac{e_t^{\xi}}{G_t^{\gamma}(C_tG_t^{\gamma})^{-\sigma}}=w_t^e \tag{12}$$

$$\beta E_t\frac{G_{t+1}^{\gamma}(C_{t+1}G_{t+1}^{\gamma})^{-\sigma}}{\pi_{t+1}}=\frac{G_t^{\gamma}(C_tG_t^{\gamma})^{-\sigma}}{1+r_t} \tag{13}$$

$$(R_t+1-\sigma)=E_t\frac{(1+r_t)}{\pi_{t+1}} \tag{14}$$

Representative Final Goods Producing Firm

A large number of firms in the economy, which is the supplier of a combination of domestic and imported goods, final household consumption is the supply and under conditions of perfect competition in the market to sell. With this, the goal of every supply of the final products, maximizing the utility function as follows:

$$\Pi_t^D=p_ty_t^{Dp}-(p_t^Fy_t^F+p_t^Hy_t^H) \tag{1}$$

According to indicating the production of the elasticity of substitution and assuming constant elasticity of substitution are equal to 1.

$$y_t^{Dp}=(y_t^H)^{\gamma}(y_t^F)^{1-\gamma} \tag{2}$$

Where in the profit function, y_t^{Dp} represent a final product of the private sector, and y_t^F aggregate demand for imported goods y_t^H . Household goods (domestic) p_t^F price of imported goods and domestic goods prices. The share of domestic products in the total cost of the final products in the production process through γ

The equations of the optimal final product suppliers and summarized as follows:

$$y_t^F=(1-\gamma)(\frac{p_t^F}{p_t})^{-1}y_t^{Dp} \tag{3}$$

$$y_t^H=\gamma(\frac{p_t^H}{p_t})^{-1}y_t^{Dp} \tag{4}$$

$$P_t=(p_t^H)^{\gamma}(p_t^F)^{1-\gamma} \tag{5}$$

Equation (17) indicates the demand for imported goods, equation (18) demand for domestic goods and equation (19) equation to determine the price of the final product is a weighted average of the prices of imported goods and domestic.

Final domestic supplier firms' behaviour[2]

[2] Firm behavior constructed based on Ireland 2000, Walsh 2003, Gali 2008 and Lou 2009.

Suppose there is a myriad of final domestic supplier that combines a variety of intermediate goods, products from domestic final goods demand that the final product suppliers, producers and under conditions of perfect competition to sell and target each supplier maximizing the profit function.

$$\Pi_t^H = p_t^H y_t^H - \int_0^1 p_t^H(i) y_t^H(i) di \quad (1)$$

Note that the production function has constant elasticity of substitution.

$$y_t^H = \left[\int_0^1 y_t^H(i)^{\frac{\theta h - 1}{\theta h}} di \right]^{\frac{\theta h - 1}{\theta h}} \quad (2)$$

In the profit function, y_t^H denotes the total supply of domestic final goods, $y_t^H(i)$ is intermediate goods domestic demand and $p_t^H(i)$ domestic intermediate good price. θh denotes elasticity of substitution between domestic intermediate good in the production process. The equations of optimal domestic product suppliers in the following summary:

$$y_t^H(i) = \left(\frac{p_t^H(i)}{p_t^H} \right)^{-\theta h} y_t^H \quad (3)$$

$$p_t^H = \left[\int_0^1 p_t^H(i)^{1-\theta h} di \right]^{\frac{1}{1-\theta h}} \quad (4)$$

Equation (22) is intermediate goods and inversely relative price of intermediate domestic goods and directly for final products supplied. Equation (23) also used to determine the price of the final home good and indicates the average weighted for domestic price of intermediate good.

Supplier of imported foreign firm's behaviour

Assumes many different countries are importer of the mix of goods, a basket of tradable goods imported final goods manufacturers demand under conditions of perfect competition and offers to sell. The goal of each importer to maximize the profit function is:

$$\Pi_t^F = p_t^F y_t^F - \int_0^1 p_t^F(j) y_t^F(j) dj \quad (1)$$

According to the same production function, we have constant elasticity of substitution

$$y_t^F = \left[\int_0^1 y_t^F(j)^{\frac{\theta f - 1}{\theta f}} dj \right]^{\frac{\theta f - 1}{\theta f}} \quad (2)$$

In Profit function the y_t^F denotes total supply of all goods imported, $y_t^F(j)$ is the import demand of j country, my $p_t^F(j)$ is the price of imported goods in j country. The production function θf is elasticity of substitution between goods imported from different countries in the production process. The equations of optimization into the final after the summary are:

$$y_t^F(j) = \left(\frac{p_t^F(j)}{p_t^F} \right)^{-\theta f} y_t^F \quad (3)$$

$$p_t^F = \left[\int_0^1 p_t^F(j)^{1-\theta f} dj \right]^{\frac{1}{1-\theta f}} \quad (4)$$

Equation (26) demand for imported commodities of the country j is inversely relative price of imported goods in the country j and he price of imported goods, is as well as a direct function of imports. Equation (27) represents the equation to determine the price of imported goods is a weighted average price of imported goods

from countries considered. Meanwhile, the price of imported goods in the domestic currency p_t^F to foreign currency p_t^{FF} multiplied by the nominal exchange rate is the price of imported goods.

$$p_t^F = ER_t p_t^{FF} \tag{1}$$

The price of foreign goods has a single root autoregressive process.

$$p_t^{FF} = p_{t-1}^{FF\ 1+ppf} p_{t-2}^{FF\ -ppf} e^{GPF+epf} \tag{2}$$

Representative Intermediate Goods Producing Firm

The behaviour of firms producing intermediate goods

Suppliers of product sale commodity to the final producers. In fact, domestic producers of intermediate goods have not perfect competition and under conditions of monopolistic competition have active.

$$\frac{\psi h}{2}\left(\frac{p_t^H(i)}{\pi^H p_{t-1}^H(i)}-1\right)^2 y_t^H \tag{3}$$

Where $p_t^H(i)$ represents the price of intermediate good i and under steady state growth rate π^H is the price of domestic goods. The production of non-tradable intermediate goods manufactured is:

$$y_t^H(i) = a_t k_{t-1}^H(i)^{\alpha} N_t^H(i)^{\mu} E_t^H(i)^{\xi} (y_t^{pgs})^{1-\alpha-\mu-\xi} e^{aat} \tag{4}$$

Where $y_t^H(i)$ denotes he production of intermediate goods, k^H is the use of capital in production, N_t^H the use of labour in production, E_t^H the use of force entrepreneurs in production, a represents the level of technology and aa represents a temporary productivity shock. Process technology is a process of unit root and determined exogenously. The profit function of home intermediate goods is as below:

$$\Pi_t^H = p_t^H(i)\left(\left(\frac{p_t^H(i)}{p_t^H}\right)^{-\theta h} y_t^H\right) - W_t^N N_t^H(i) - W_t^E E_t^H(i) - R_{t-1}^k p_{t-1} kp_{t-1}^H(i) - \frac{\psi h}{2}\left(\frac{p_t^H(i)}{\pi^H p_{t-1}^H(i)}-1\right)^2 y_t^H \tag{1}$$

Each firm plans to maximize the present value as below:

$$E_t \sum_t^{\infty} \beta^t \left(p_t^H(i)\left(y_t^H\right) - W_t^N N_t^H(i) - W_t^E E_t^H(i) - R_{t-1}^k p_{t-1} kp_{t-1}^H(i) - \frac{\psi h}{2}\left(\frac{p_t^H(i)}{\pi^H p_{t-1}^H(i)}-1\right)^2 y_t^H \right) \tag{2}$$

Subject to:

$$y_t^H(i) = a_t k_{t-1}^H(i)^{\alpha} N_t^H(i)^{\mu} E_t^H(i)^{\xi} (y_t^{pgs})^{1-\alpha-\mu-\xi} e^{aat} \tag{3}$$

Then we have

$$\frac{W_t^N N_t^H}{W_t^E E_t^H} = \frac{\mu}{\xi} \tag{1}$$

$$\frac{W_t^N N_t^H}{R_{t-1}^k p_{t-1} kp_{t-1}^H} = \frac{\mu}{\alpha} \tag{2}$$

$$\frac{y_t^H}{N_t^H}=\frac{\left(\frac{W_t^N}{p_t^H}\right)}{(1--\theta h)\mu}\left[-\theta h+\psi_h\left(\beta E\left(\frac{W_{t+1}^N N_{t+1}^H}{W_t^N N_t^H}\left(\frac{p_{t+1}^H}{\pi^H p_t^H}\right)\right)-\left(\frac{p_t^H}{\pi^H p_{t-1}^H}\right)\left(\frac{p_t^H}{\pi^H p_{t-1}^H}-1\right)\right)\right] \quad (3)$$

Equation (36) represents the ratio of labour costs at the expense of the entrepreneur. Equation (37) also represents the optimal ratio of labour costs to cost of capital and the equation (38) is a New Keynesian Phillips curve.

Central Bank and Government Behaviour

It is clear that because of the lack of independence of the monetary authorities in Iran, both the government and the central bank cannot be considered as two distinct models. The aim here is to provide theoretical arguments, functional model and the full name of the monetary authorities.

Also according to the central bank in terms of inflation targeting, price stability and economic growth, along with the implicit goal of the central bank's monetary policy tools to pursue the realization of two important. In addition, it provides care enough to balance the budget by the government, through three sources of tax income than households, the sale of bonds and net income from oil, the creation of money does not happen. However, if the occurred deficit, government borrows from the central bank and withdraw their deposits from Central Bank, to finance its budget deficit. In addition, the exchange sold of its oil revenues to the government for changes in the monetary base is considered. As a result, the so-called monetary base changes can be reflected in the budget constraint, oil revenues and withdrawal of government deposits with the central bank.

Hence we assume the nominal government spending rather than serve under a process of economic optimization, policy-based budgeting processes and act as exogenous, in addition to the oil the impact of the shocks of the transition. Accordingly, we have:

$$G_t=G_{t-1}^{1+\rho g}G_{t-2}^{-\rho g}e^{(GG+\rho^{go}e^{\varphi p_t+G_t})} \quad (1)$$

At the same time the government assumed part of the budget spent on current expenses (GC) and spent the rest of the construction costs (GP). It also assumes that the government's current cost of the state budget is spent on employment (N^g) from the government to supply public services. If we define the government budget constraint:

$$G_t+(1+r_{t-1})\frac{B_{t-1}}{p_t}=T_t+\frac{B_t}{p_t}+\frac{M_t-M_{t-1}}{p_t}$$

Where G is government spending and M is the monetary base and expenditure for government progress expenditure is GP and government consumer expenditure is GC so we have as follows:

$$G_t=GC_t+GP_t \quad (2)$$

$$N_t^g=\frac{CG_t}{W_t^N} \quad (3)$$

$$GC=gc*G_t \quad (4)$$

Also here is assumed that public projects have time lag so public investment, and thus formed fixed capital formation in the public sector The delay in the implementation of projects approval, following the model Fukava (2012) will be modelling capabilities. A_t^I shows the investment approved by the government in the budget at time t and the number of periods required to complete the project by N. The capital law of motion for public progressive investment will be as follows:

$$K_{t+1}^G=I_t^G+(1-\delta^G)K_t^G \quad (5)$$

Where δ^G the rate of depreciation of public capital investments and government is AR(1) the total public investment expenditure in the current resolution and progressive is visualized as follows:

$$\hat{C}_t^G = \rho_{CG}\hat{C}_{t-1}^g + \varepsilon_t^{CG} \quad (6)$$

$$\hat{I}_t^G = \rho_{IG}\hat{I}_{t-1}^G + \varepsilon_t^{IG} \quad (7)$$

As evidence of the state of the economy in terms of the volume of expenditure is apparent from oil revenues will follow. In such a way that during the oil boom construction activities and consequently an increase in expenditure and vice versa during the recession, oil revenues are also seeing a decrease in government expenditure can be completed, so investment costs following written

$$\hat{I}_t^G = \sum_{n=0}^{N-1} \phi_n A_{t-N}^I \quad (8)$$

Where ϕ_n denotes the rate of investment during the show. When N = 1 there is no delay between the time the decision to do with the operation of public investment projects there.
The monetary base is defined as follows:

$$M_t = DC_t + FR_t \quad (9)$$

Where DC_t denotes currency and deposits also include current and overall domestic credit and FR_t is foreign reserves (net foreign assets of the central bank). In this regard the assumption of foreign and domestic private banks is zero. Therefore net government debt to the central bank after deduction of net government deposits at the central bank and bank debt to the central bank as well. This is in fact the central bank balance sheet is as real as it can be written as follows:

$$m_t = dc_t + fr_t \quad (10)$$

The accumulation of foreign central banks will follow the following rule:

$$fr_t = \frac{fr_{t-1}}{\pi_t} + \zeta o_t \quad (11)$$

Where the accumulation of foreign assets of the central bank depends on the direct sale of oil revenues O_t. In other words, it is assumed that the percentage of oil revenues directly to the Central Bank sold $\zeta \in (0,1)$ and converted into riyals, and the percentage of it according to the law gives to the National Development Fund and to the requirements of harvest time and spend. The decision on how to spend oil revenues will be determined by the parameter $1-\zeta$. It is also assumed that in a closed economy of the National Development Fund to truly follow the following rule in which the percentage of oil revenues in each period the fund kept in the law of spent.

$$df_t = \frac{df_{t-1}}{\pi_t} + (1-\zeta)o_t \quad (12)$$

Also, we assume the oil revenues follow as AR(1)

$$o_t = \rho_0 o_{t-1} + \varepsilon_t^0 \;\; \varepsilon_t^0 \sim i.i.d.N(0,\sigma^2) \quad (13)$$

In this regard, it is assumed that monetary policy instrument of the monetary authorities, the growth rate of the monetary base, although other assumptions may be considered, but this assumption is fairly explains the current situation of Iran's economy. It can conduct monetary policy in the economy of Iran explain. It can also be assumed that the monetary policy reaction function to be taken that the two aim to reduce the deviation of output from potential output and inflation deviations from the inflation target in the monetary growth rate, at least the. Obviously, the goal is not explicit and implicit monetary authorities with the description. In other words, the implicit inflation target in the form of a log-linear process complies with the following.

$$\hat{\dot{m}}_t = \rho_m \hat{\dot{m}}_{t-1} + \lambda_\pi(\hat{\pi}_t - \hat{\pi}_t^*) + \lambda_y \hat{y}_t + \upsilon_t \quad (14)$$

$\varepsilon_t^{\pi^*} \sim i.i.d.N(0,\sigma_\pi{}^2)$ $\pi_t^* = \rho_{\pi^*}\pi_{t-1}^* + \varepsilon_t^{\pi^*}$ و (15)

In equation (52), $\hat{\hat{m}}_t$ denotes percentage of deviation from the steady state of growth of the monetary base, $\hat{\pi}_t$ percentage of deviations of inflation from its stea $\hat{\pi}_t^*$ dy state value in the period t, the percentage of the target inflation deviation from the target value in the period t, $\hat{y}_t$ is the output gap and υ_t is monetary shocks. Here again, it is assumed that a process is followed as follows:

$$\upsilon_t = \rho_\upsilon \upsilon_{t-1} + \varepsilon_t^{mb}, \varepsilon_t^{mb} \sim iid.N(0,\sigma_{mb}{}^2) \quad (16)$$

ε_t^{mb} is the shock from money base.

5. Equilibrium determination

5.1. Markets clearing

If the consumer's budget constraint equation (2), the government budget constraint equation (40) are combined, market-clearing conditions for goods and services and the aggregate demand equation is obtained as follows:

$$Y_t = C_t + I_t + G_t \quad (1)$$

On the other hand the aggregate demand and aggregate supply that the sum of the total supply in the economy (private sector, public and import) must be equal to:

$$P_t y_t^D = P_t y_t^S = p_t^H y_t^H + p_t^F y_t^F + GC_t \quad (2)$$

Using variables which have become real money trading (11), the supply of labor (12), a pair of entrepreneurs (13), Euler equation (14) and the relationship between the rate of return on bonds and capital lease rate will be the following equations:

i. $$\varpi\left(\frac{\hat{M}_t}{p_t}\right)^{-\varsigma} = \left(\frac{r_t}{1+r_t}\right) G_t^\gamma (\bar{C}_t \bar{G}_t^\gamma)^{-\sigma}$$

ii. $$\chi \frac{N_t^\mu}{G_t^\gamma (C_t G_t^\gamma)^{-\sigma}} = w_t^N$$

iii. $$\chi \frac{e_t^\xi}{G_t^\gamma (C_t G_t^\gamma)^{-\sigma}} = w_t^e$$

iv. $$(R_t + 1 - \sigma) = E_t \frac{(1+r_t)}{\pi_{t+1}}$$

v. $$\beta E_t \frac{G_{t+1}^\gamma (C_{t+1} G_{t+1}^\gamma)^{-\sigma}}{\pi_{t+1}} = \frac{G_t^\gamma (C_t G_t^\gamma)^{-\sigma}}{1+r_t}$$

5.2. Log - linearing

In addition it should be noted that our model due to the presence of elements (such as static random process) is required log-linearing. On the other hand, assuming that the variable log deviations from steady state of using log-linear equations are as follows:

vi. $$\varpi \bar{m}^{-\varsigma}(1-\varsigma\hat{m}) = \left(\frac{r_t}{1+r_t}\right) \bar{G}_t^\gamma (\bar{C}_t \bar{G}_t^\gamma)^{-\sigma} (1 - \hat{r}_t - \sigma\hat{c}_t + \gamma(1-\sigma)\hat{g}_t)$$

vii. $$\hat{m}_t = \frac{\sigma}{\varsigma}\hat{c}_t + \frac{\gamma(\sigma-1)}{\varsigma}\hat{g}_t - \frac{1}{\varsigma}\hat{r}_t$$

$$\chi \frac{N_t^{\mu}}{G_t^{\gamma}(C_t G_t^{\gamma})^{-\sigma}}(1+\mu\hat{n}_t + \sigma\hat{c}_t + \gamma(1-\sigma)\hat{g}_t) = \overline{w}(1+w_t^N)$$

viii. $$\hat{w}_t^N = \mu\hat{n}_t + \sigma\hat{c}_t + \gamma(1-\sigma)\hat{g}_t$$

$$\chi \frac{e_t^{\xi}}{G_t^{\gamma}(C_t G_t^{\gamma})^{-\sigma}}(1+\xi\hat{e}_t + \sigma\hat{c}_t + \gamma(1-\sigma)\hat{g}_t) = \overline{w}(1+w_t^e)$$

ix. $$\hat{w}_t^e = \xi\hat{e}_t + \sigma\hat{c}_t + \gamma(1-\sigma)\hat{g}_t$$

$$\beta\frac{\bar{G}^{\gamma}(\bar{C}\,\bar{G}^{\gamma})^{-\sigma}}{\bar{\pi}}E_t(1-\sigma\hat{c}_{t+1}+\gamma(1-\sigma)\hat{g}_{t+1}-\hat{\pi}_{t+1}) = \frac{\bar{G}^{\gamma}(\bar{C}\bar{G}^{\gamma})^{-\sigma}}{\pi_{t+1}} = \frac{G_t^{\gamma}(C_t G_t^{\gamma})^{-\sigma}}{\bar{\pi}}(1-\sigma\hat{c}_t+\gamma(1-\sigma)\hat{g}_t-\hat{r}_t$$

x. $$\hat{c}_t = \hat{c}_{t+1} - \frac{1}{\sigma}\left\{\hat{r}_t - \hat{\pi}_{t+1} - \gamma(\sigma-1)\left[\hat{g}_{t+1} - \hat{g}_t\right]\right\}$$

$$\bar{R}(1+r_t) + (1-\sigma) = \frac{1+\bar{r}}{\bar{\pi}}E_t(r_t - \pi_{t+1})$$

xi. $$\hat{R}_t = \frac{1+k}{\sigma+k}(\hat{r}_t - \hat{\pi}_{t+1}), k = \frac{1-\beta}{\beta}$$

The issue of maximizing profits by producing goods and final goods manufacturer in accordance with what was presented before, New Keynesian Phillips curve, the demand for labor and the cost per unit of output is obtained by the mobile production function, equation of motion and the technology shock capital move rule and equations were linearized equations now log in to see the following:

xii. $$\frac{\hat{W}_t^N \hat{N}_t^H}{\hat{W}_t^E \hat{E}_t^H} = \frac{\mu}{\xi}$$

xiii. $$\frac{\hat{W}_t^N \hat{N}_t^H}{\hat{R}_{t-1}^k p_{t-1}\hat{k}_{t-1}^H} = \frac{\mu}{\alpha}$$

xiv. $$\frac{\hat{y}_t^H}{\hat{N}_t^H} = \frac{\left(\frac{\hat{W}_t^N}{\hat{P}_t^H}\right)}{(1-\theta h)\mu}\left[-\theta h + \psi_h\left(\beta E\left(\frac{\hat{W}_{t+1}^N \hat{N}_{t+1}^H gm_{t+1}}{\hat{W}_t^N \hat{N}_t^H}\left(\frac{\hat{p}_{t+1}^H gm_{t+1}}{\pi^H \hat{p}_t^H ga_{t+1}} - 1\right) - \left(\frac{\hat{p}_t^H gm_t}{\pi^H \hat{p}_{t-1}^H ga_t}\right)\left(\frac{\hat{p}_t^H gm_t}{\pi^H \hat{p}_{t-1}^H ga_t} - 1\right)\right)\right)\right]$$

According to the Phillips curve, the marginal cost of production and it can be seen that the capital increase to reduce inflation and thus increase production final cost of a product unit and reduce inflation.

Log- linearing for government spending and monetary authorities would be as follows:

xv. $$C\hat{G}_t = \hat{G}_t$$

xvi. $$n_t^g = C\hat{G}_t - \hat{W}_t$$

xvii. $$\hat{g}_t = \frac{c\bar{g}}{\bar{g}}c\hat{g}_t + \frac{g\bar{i}}{\bar{i}}g\hat{i}_t$$

xviii. $$i\hat{t} = \frac{\bar{i}}{i\bar{t}}\hat{i}_t + \frac{g\bar{i}}{i\bar{t}}g\hat{i}_t$$

xix. $$g\hat{i}_t = \sum_{n=0}^{N-1}\phi_n A_{t-N}^I$$

xx. $$c\hat{g}_t = \rho_G c\hat{g}_{t-1} + \varepsilon_t^G, \qquad \varepsilon_t^G \sim i.i.d.N(0,\sigma^2)$$

xxi. $$k\hat{g}_t = (1-\sigma_g)k\hat{g}_{t-1} + \sigma_g\hat{A}_{t-N+1}^i$$

xxii. $$\hat{A}_t^I = \rho^I \hat{A}_{t-1}^I + \varepsilon_t^I + \varepsilon_t^0 \;\; \varepsilon_t^I \sim i.i.d.N(0,\sigma^2)$$

xxiii. $\hat{m}_t = \frac{dc}{m} d\hat{c}_t + \frac{fr}{m} \hat{fr}_t$

xxiv. $\hat{fr}_t = fr\hat{r}_{t-1} - \hat{\pi}_t + \zeta \frac{o}{fr} \hat{o}_t$

xxv. $d\hat{f}_t = \hat{df}_{t-1} - \hat{\pi}_t + (1-\zeta)\hat{o}_t$

xxvi. $\varepsilon_t^o \square\ i.i.d.N(0,\sigma^2)\ \hat{o}_t = \rho_0 \hat{o}_{t-1} + \varepsilon_t^0$

xxvii. $\hat{m}_t = m_t - m_{t-1} + \hat{\pi}_t$

6. Estimation and calibration

To estimate the parameters of Bayesian methods and algorithms used Metropolis- Hastings is also referred to. Using the algorithm, three parallel chains with a volume of 50 thousand to get super-dense Late obtained parameters. On the other hand due to structural shocks in the model to estimate the possibility of using variable is visible. Therefore, in this study the variables inflation, the monetary base growth rates, private consumption expenditure, output gap, government consumption spending and oil revenues are used. Private consumption expenditure variable, the output gap and inflation indicate that the overall economic situation, the growth rate of the monetary base index of monetary policy, fiscal policy and consumer spending represents oil revenues, the role of oil in the economy. The calibrated parameters and parameter estimation model based on experimental studies in Tables 1 and 2 have come.

Table 1 - Baseline model calibrated parameters

$\bar{c}/\bar{y}$	$\bar{i}/\bar{y}$	$\bar{g}/\bar{y}$	$\bar{i}/i\bar{t}$	$g\bar{i}/i\bar{t}$	$c\bar{g}/\bar{g}$	$\bar{g}i/\bar{g}$	$\bar{o}/d\bar{f}$	$\bar{o}/\bar{fr}$	$d\bar{c}/\bar{m}$	$f\bar{r}/\bar{m}$	ξ	ξ_g
0.53	0.24	0.23	0.67	0.33	0.7	0.3	0.03	0.13	0.46	0.54	0.0139	0.0218

Table 2 - Baseline model Bayesian estimation

Estimation	Source	Prior estimation	Distribution	Definition	Parameter
0.9648 (0.0125)	Kavand, 2011	0.97 (0.018)	beta	Rate of intertemporal preferences of consumer	β
0.6005 (0.0151)	-	0.7 (0.02)	beta	Percent of firm cannot reduced their prices	ξ
0.4427 (0.02)	-	0.42 (0.02)	beta	Share of private capital in production	α
0.0953 (0.01)	-	0.1 (0.01)	normal	Elasticity of substitution between private and public investment	ψ
1.1662 (0.05)	Tavakolian 2014	1.571 (0.05)	gamma	Inverse of the elasticity of intertemporal consumption	σ
0.1931 (0.001)	-	0.2 (0.001)	beta	Elasticity of substitution between private and public consumption	γ
2.8938 (0.0499)	-	2.175 (0.05)	gamma	Inverse elasticity of Frisch labor supply	η
1.0721 (0.0205)	-	2.39 (0.05)	gamma	Inverse elasticity of real money balances	b
0.7836 (0.0015)	-	0.8 (0.02)	beta	Percent of direct oil revenues selling to CB	ω
0.8506 (0.01)	-	0.85 (0.01)	beta	AR process multiplier for capital in budget bill	ρ_A
0.02603 (0.0102)	AR(1) estimation	0.27 (0.01)	beta	AR process multiplier for oil revenues shock	ρ_o
0.9268 (0.0458)	-	0.9 (0.05)	beta	AR process multiplier for technology shock	ρ_a

Estimation	Source	Prior estimation	Distribution	Definition	Parameter
0.31 (0.013)	-	0.1 (∞)	Inverse gamma	Standard errors for public investment shock	σ_A
1.01 (0.104)	-	0.1 (∞)	Inverse gamma	Standard errors for oil revenues shock	σ_O
0.06 (0.003)	-	0.1 (∞)	Inverse gamma	Standard errors for technology shock	σ_a

It should be noted that the previous distribution parameter for each parameter has been selected based on the characteristics and properties of the selected distribution. For example, beta distribution is a distribution known by three parameters: mean, standard deviation, the lower and upper limit. Therefore, in order to estimate and determine these parameters which are at specific intervals of the real figures, it is better use of the beta distribution. In addition, the gamma distribution is defined amplitudes of zero to infinity. Thus, the distribution range of the disposal has been positive. In Figure 1 the prior and posterior estimated distribution model parameters are provided.

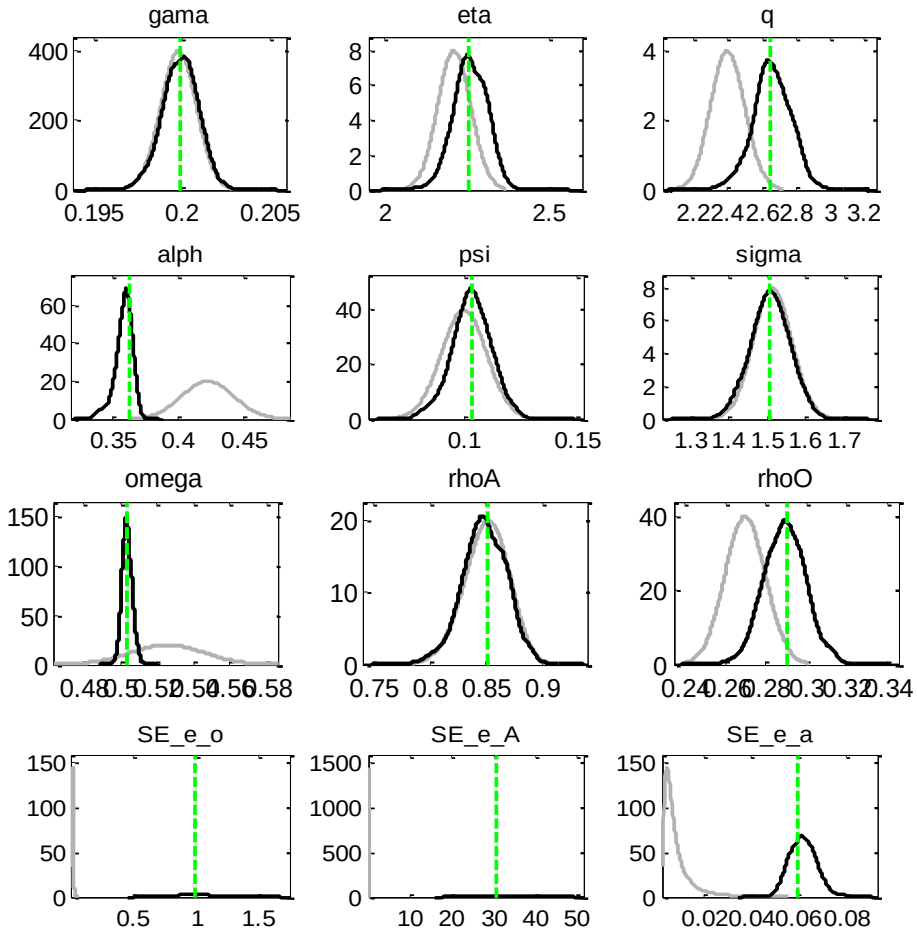

Figure 1 - Prior and posterior distribution based on metro polis –Hastings algorithm

7.Impulse response functions

To examine the dynamics of economic variables associated with the research, response functions estimated based on the research model are obtained. It is necessary to note that among the multiple functions obtained from the reaction of monetary impulses aspects, technology, oil and construction budget is done more focus.

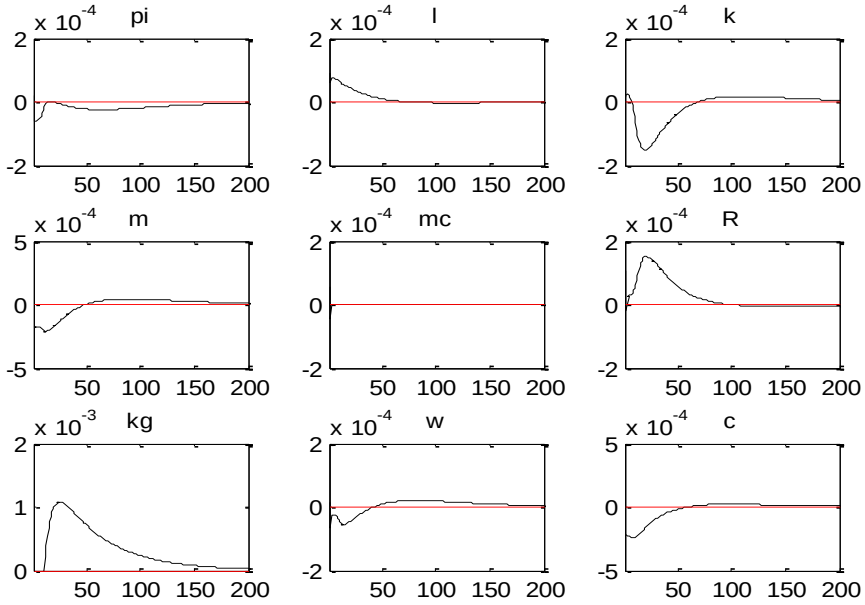

Figure 2 - Impulse response function for technology

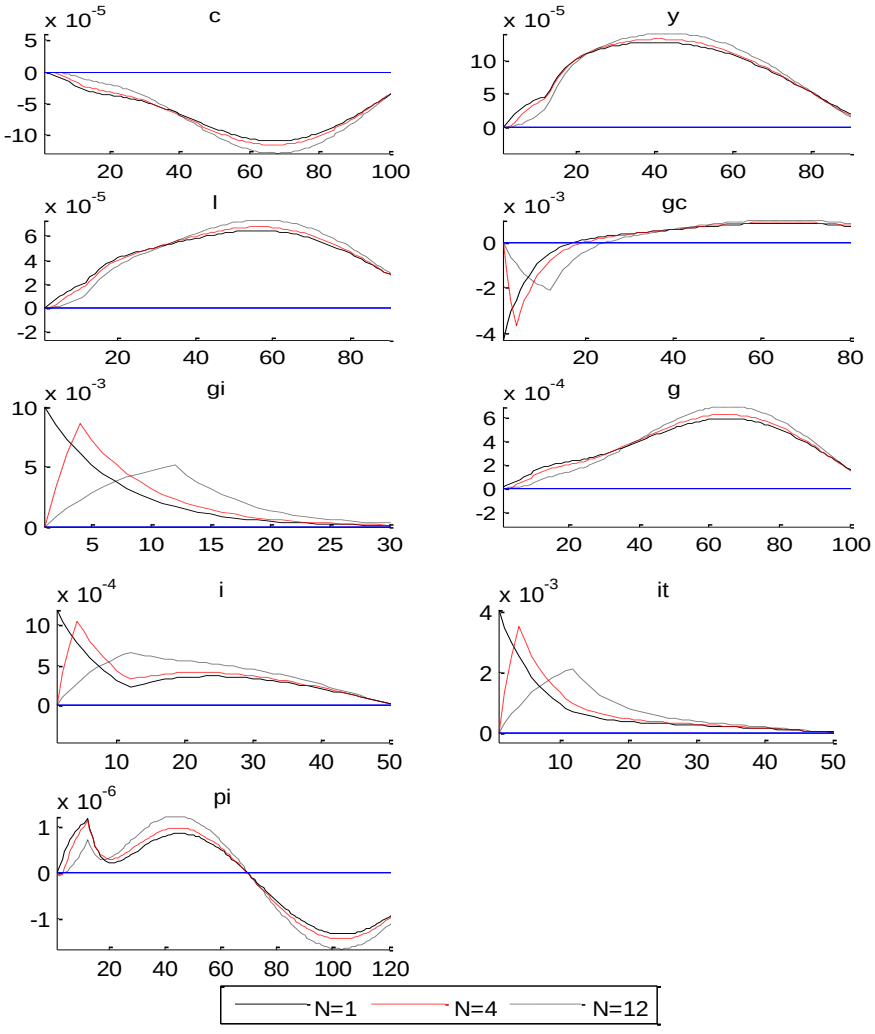

Figure 2 - Impulse response function for progressive expenditures (N=12)

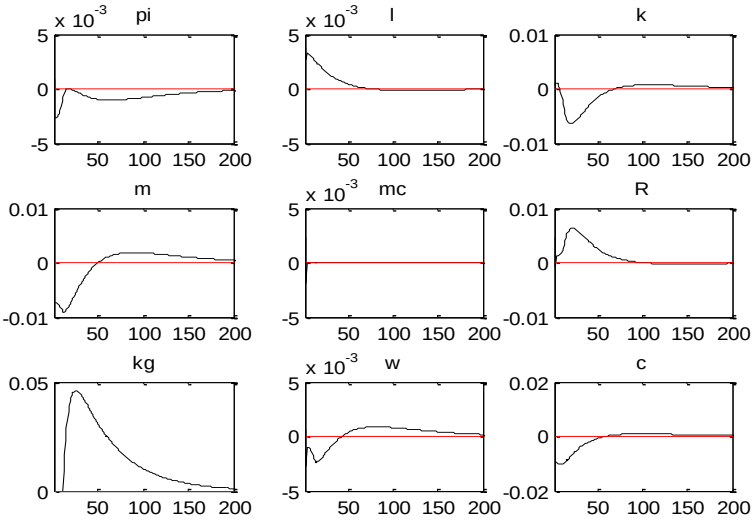

Figure 3 - Impulse response function for oil revenues

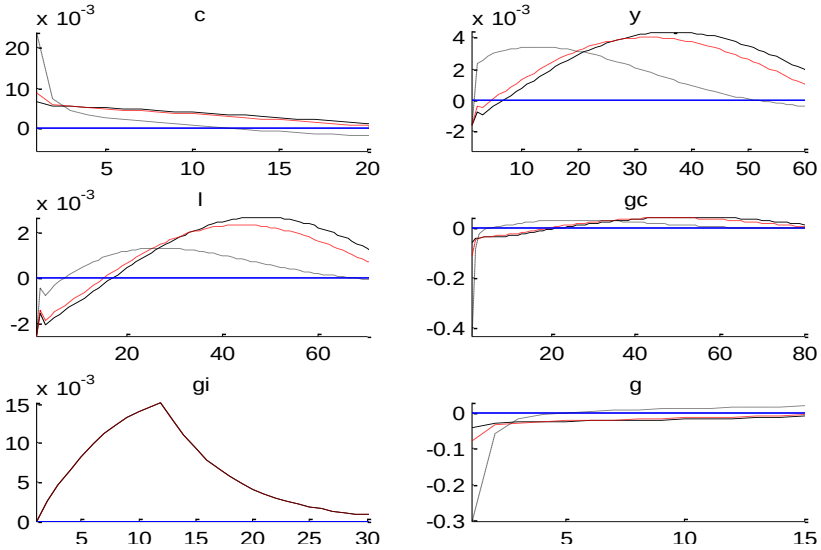

Figure 4 - Impulse response function for oil revenues (N=12

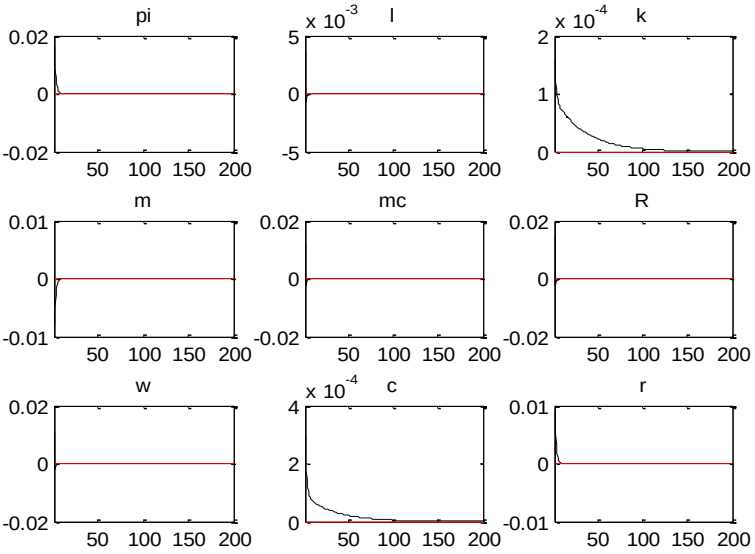

Figure 5 - Impulse response functionfor money base (N=12)

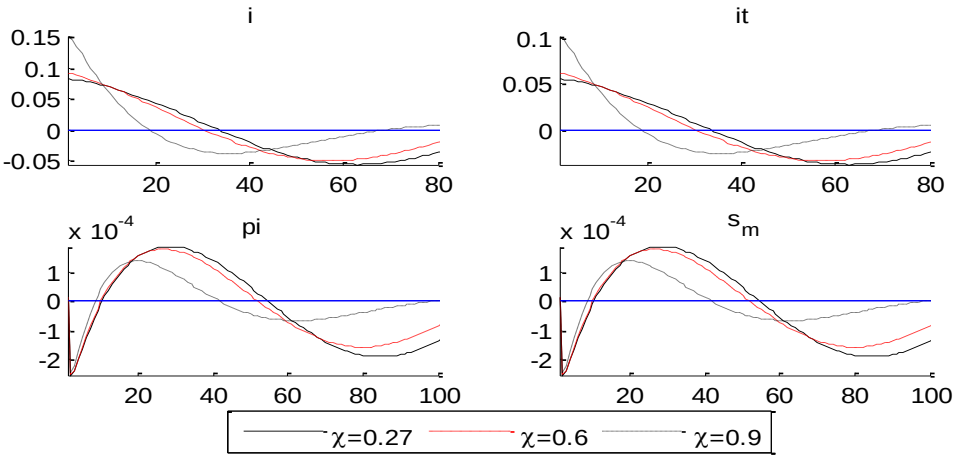

Figure 6 - Impulse response function for money base (N=12)

Conclusion

According to above mentioned in accordance with the theoretical expectations, following the effect of a positive shock inflicted on the government investment which leads to increase and gradual accumulation of fixed capital formation in the public sector, consumption is first affected and reduces, then employment increases Consequently, production will also be affected. This result is a little different with theoretical approach of Fukava (2012) research because with a neo-classical approach, the increase of public sector formation often funded through taxes and this tax increase from a welfare analysis approach has a negative effect on household wealth and general family well-being which results in consumption reduction and increase the supply of labour.

But what happens here is financing projects through oil revenues though the effective channel is different specifically this effect has different fluctuation for various times. So when development projects are carried out without interruption in terms of time, employment happens more. On the other hand due to the increased role of states in financing projects, reduction of the capital rent cost and inflation will also happen. Also it is notable that government expenditure Increase causes state capital increase which leads to the long-term effect of shock effect inflicted on government investment

Also with the shock of oil revenues, increased oil revenues results in public investment at first, because the increase in oil revenues, the government increases development expenditure. Though increase in development expenditure is more than Increase in current expenditure. Enhancing development expenditure & construction spending causes total spending increase and as a result of increased production of oil income, consumption and total investment will rise. This increase leads to inflation too. Though by increasing the inflation resulted from oil revenues, the monetary authority will react through reducing the growth rate of the monetary base. However, the continuation of oil injection to the monetary base action to reduce inflation will be eroded and the government will be able to control inflation for a short time then the consumer welfare will reduces.

However, with entering a monetary shock to the economy, according to the figures, inflation increases, both real wages and real rent of capital decrease then consumer welfare reduces. With the emerged inflation emerged of a monetary shock, the government and the central bank react their anti-inflationary response in the form of monetary policy and reduction of money growth rate which result in production reduction, investment decrease and government spending cuts.

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MOTIVES AND DETERMINATS OF FOREIGH DIRECT INVESTMENT IN THE REPUBLIC OF MACEDONIA

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Abstract

In order to design appropriate Foreigh Direct Investment (FDI) attraction policies there is a need of exploring which are the key motives and determinants of FDI inflow in the host-country.
The aim is to see whether the Republic of Macedonia follows the global trends due to FDI in transition countries and, in this regard, to research the reasons for the low FDI inflow in the country.

The paper is organized as follows. In introduction we point the importance of FDI inflow in transition countries, and in this context we emphasize the importance of the motives, and therefore the determinants that conditioned the FDI inflow. Section I review the theoreticalframework on the FDI determinants, with particular reference to the OLI paradigm. Section II analyses the inflow and structure of FDI in the Republic of Macedonia. In order to explore the FDI motives and determinants in the Republic of Macedonia, which will serve as a reference framework for defining the future direction of policy related to FDI in the Republic of Macedonia, in the third part an empirical research has been conducted in the form of a questionnaire. The conclusion defines the key findings in context of the policy for attracting FDI in the Republic of Macedonia.

Keywords: foreign direct investment, motives, determinants, transition countries

JEL Classification: F02, F21, F23

1. Introduction

In the last several decades globalisation established a new approach towards FDI-related policies and imposed new principles. Globalization contributed towards restructuring the economies in the direction of improving the efficiency of transition countries' comparative advantages, including the changes in the FDI motives and determinants.
Simultaneously, more than two decades since the start of the transition, as well as the accession of part of the transition countries into EU, we are given a possibility to compare the FDI attraction policies and see which policies were successful and which weren't. Experience has shown that the countries that have attracted larger FDI inflow, in general have a higher degree of macroeconomic stability and a faster economic development with the EU membership prospects.

The Republic of Macedonia, in the period of transition, given the weak economy and the low household savings, looked for the way out of the economic crisis in the greater inflow of foreing capital. But the data show

that foreigh capital inflows in the country are still far from the expectations and needs. In this context, the paper detects the conditions related to FDI in the Republic of Macedonia and represents a reference framework for defining the policy of attracting foreign capital.

2. Eclectic Theory

The need to synthesize various aspects of motives for export of capital in the form of FDI and simultaneously enable their empirical study led to the occurrence of eclectic theory, or OLI (Ownership – Location – Iinternationalization) paradigm.

The eclectic theory, known as OLI-paradigm of John H. Dunning 1981, which is then reformulated (1988, 1995, 1997, 2000) synthesizes all of the aforementioned theories and represents a modern concept that explains the motives for export of capital in the form of FDI.[3]

The OLI paradigm explaisn the change in the international position of the country depending on the level of economic development and is particularly applied in the study of motives for export of capital in the form of FDI in less developed countries and in this context, in transition countries.

The OLI paradigm has proposed that the returns to FDI can be explained by the competitive-ownership advantages of firms (O), indicating "who is going to produce abroad", by location factors (L) "influencing where to produce" and by the internalisation factor (I) that "addresses the question of why firms engage in FDI rather than license foreign firms".[4]

The basic hypothesis ofOLI-Paradigm is that the company will engage FDI if and when they realize all three groups of advantagesThe Paradigm point that the combination of Ownership, Location and Internalization advantages and their exact configuration defines which companies become TNCs, where to locate their production and how they are involved in international production. In explaining the paradigm Dunning considers that "…in the formulation of operational hypotheses about the relationship between individual variables and OLI-level and pattern of international production, it is important to determine the context in which the relation is researched".[5]

The most systematised approach for the FDI inflow determinants in the capital host country was made by UNCTAD, in 1998.[6]

According to this classification, the FDI inflow determinants in the capital host country have been distributed into three groups: factors related to FDI national policies, economic factors and country's business climate.

The relative importance of some determinants is likely to vary between different types of FDI, i.e. resource-seeking, market-seeking, efficiency-seeking and strategic assets-seeking FDI.[7]

Market-seeking investors will be attracted to a country with a large or fast market growing potential. Market size in terms of country population and income matters a lot. Actually, it is not interesting to invest in a country with a very high GDP per capita but with a limited amount of consumers or in case when a country has a lot of inhabitants, but a low GDP per capita. Foreign investments in transition countries are influenced by market seeking motive, due to differences in the size of their domestic markets. SEE countries compared to CIS counties are quite small and that is why almost equal important is the market with huge potential. If it is very easy to access neighbouring countries markets due to trade agreements, then this motive is very significant in transition economies.

The second type of FDI is asset-seeking or resource-seeking FDI. It takes place when the company's purpose is to gain access or acquire the resources in the host country which are not available in the home country, such as raw materials, natural resources or low-cost labour. It is especially related to the manufacturing sector. Transition countries are not very rich in natural endowments (except for the Commonwealth of Independent States, CIS), so the significance of this motive is low and does not influence in great scope foreign investor's decision. In terms of O advantages, SEE has mostly been attracting companies in the labour intensive industries. Most recently, unskilled workforce or low labour cost becomes more a facilitator than a motive for investing abroad, since foreign investors are becoming more interested in well-qualified and educated workforce.

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[3] Dunning, John H. (1993). *Multinational Enterprises and the Global Economy*. Addison-Wesley.

[4] Dunning, John H. (2001). The Eclectic (OLI) Paradigm of International Production: Past, Present and Future, *International Journal of the Economics of Business*, 8(2):173-90.

[5] Dunning, John H. (2001). The Eclectic (OLI) Paradigm of International Production: Past, Present and Future", *International Journal of the Economics of Business*, 8(2):173-90.

[6] UNCTAD (1998). World Investment Report. Trends and Determinants, UN. http://unctad.org/en/wir1998

[7] Dunning, John H. (2000). The Eclectic Paradigm as an Envelope for Economic and Business Theories of MNE Activity", *International Business Review*, 9(1): 163-90.

The third type of FDI is efficiency-seeking FDI. It takes place when the company can gain when there is a common governance of geographically dispersed activities and presence of economies of scope and scale.

The strategic assets-seeking motive is important for a small number of industries, such as electronics, chemistry and infrastructure. In order for this motive to be utilized, it is more than necessary for countries to have a capacity to absorb the strategic assets. In this framework, transition countries do not have sufficient capacity to absorb them and therefore this motive is not applicable for decision making investments.

According to J. H. Dunning, the so-called institutional infrastructure represents locally related instruments intended for facilitating economic activities (including FDI) by decreasing transaction costs of such activities.[8] Institutional infrastructure is present in all three groups of determinants of FDI inflow and constitutes an "umbrella" affecting the efficiency of each of the groups of factors.[9] This reveals that the investor's motives are changing and therefore countries must seek new ways to attract FDI.

3. The Foreigh Capital Inflow in the Republic of Macedonia

In the period after independence, the Republic of Macedonia faced a number of economic and political problems. The macroeconomic instability, hyperinflation, and the high amount of inherited external debt were one of the many difficult problems that the Macedonian economy has faced in the early 1990s. Also, the political and economic blockades, sanctions of the Security Council of the UN against Yugoslavia, the Greece embargo against Macedonia, the war in former Yugoslavia, the Kosovo crisis and the political and security crisis in the Republic of Macedonia had a negative impact on the Macedonian economy. As a result of these events, the FDI inflow until the mid-1990s in the country was very low.

After 1995, as a result of the implementation of the stabilization program and the implementation of the structural reforms in the Macedonian economy, the interest of the foreign investors in Macedonia has been growing. However, FDI in the country is still very low. In the period from 1993 to 1997, the FDI in the country amounted to approximately 74.7 million US dollars (Chart 1). During this period, most of the FDI was in the food and food industry.

The low FDI inflow in the Republic of Mcedonia in the 1990s, except for the political and security situation in the territory of former Yugoslavia, is due to the privatization which for the most part was realized in this period. By 1998, about 90% of the industrial enterprises have been already privatized, but the Republic of Macedonia, unlike other ountries in transition, failed to take adventage of the privatization in order to attrack foreign capital. One of the reasons for the low FDI inflow during privatization, according to many economists, is the result of the method of privatization. The so-called insider privatization favored domestic over foreign investors.[10]

The first significant FDI have been realized in the late 90s. In 2000, the FDI amounted 215,1 million US dollars, of which most significant were the investments in the banking sector and insurance.

In 2007, the Republic of Macedonia by following the example of some former transition countries of Central Europe, has introduced a model of investing in technological and industrial development zones, which significantly contributed to the growth of FDI inflows in the country. As a result of that, in 2007 the FDI inflow in the Republic of Macedonia amounted a record high 699,1 million US dollars (Figure 1).

In 2008 and 2009, the FDI in the country has declined primarily due to the developments in the world economy.

In the beginning of the crisis the Macedonian economy, as in most countries in transition, did not feel the effects of the global economic crisis. But, in the first half of 2009 the negative effects of the crisis were felt in the country. The postponement of investments in foreign companies, being a result of lack of funding, has resulted in a decline in FDI in the country.

In 2011, the FDI in the country are growing again and compared to 2010, they have increased for more than double, from 211 to 463,3 million US dollars.

[8] Dunning, John H. (2004). Institutional Reform, FDI and European Transition Economies", Hehley University of Reading, http://www.henley.ac.uk/web/FILES/management

[9] Dunning, John H. (2000). The Eclectic Paradigm as an Envelope for Economic and Business Theories of MNE Activity, *International Business Review*, 9(1): 163-90.

[10] Slaveski, Trajko. (1997). *Privatizacija, pazar, drzhava.*Ekspres-Magna.

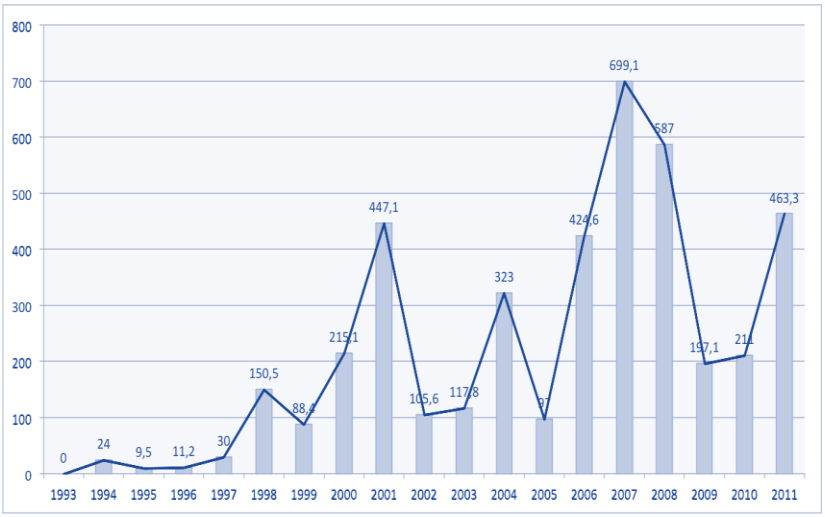

Figure1 - FDI inflow in the Republic of Macedonia, 1993-2011 (in bill. $)

The share of FDI in gross fixed capital investment in the country in average amounts about 30%.[11] The high share of FDI in gross fixed capital investments confirms the fact that FDI in the country are significant source of capital necessary for the implementation of structural reforms, but also points to the high dependency of the country on foreign accumulation, which may adversely reflect the economic development in the long term. In the some time, the data on the share of FDI in GDP of the Republic of Macedonia suggests that FDI still have no signifanct contribution in boosting the economic development of the country.

In terms of the geographical structure of FDI in the Republic of Macedonia, the data show that most FDI in the Republic of Macedonia come from developed countries, and mainly from Greece, Hungary and Switzerland. These countries on average held more than third of the total FDI in the Republic of Macedonia, indicating a high concentration of foreign capital of only few countries.

In terms of the sectoral structure of FDI in the Republic of Macedonia, by 2000, more than 50% of the foreign capital in the country is in the manufacturing sector. But, in the last decade the FDI in the Republic of Macedonia are mostly in the service sector, which is correlated with the global trend of dominant share of FDI in this sector in recent decades.

In the late 1990s, the countries in transition, following the global changes in world economies have started the process of liberalization of the service sector. In this context, the Republic of Macedonia began the process of privatization in telecommunications and financial sectors. As a result of these developments, the analysis of FDI inflow in the Repuiblic of Macedonia shows that in 2000 and 2001, the first significant foreign investments were realized in these sectors.

In the early transition, the FDI in the Republic of Macedonia as in most transition countries, were dominant in the form of mergers and acquisitions, primarily as a result of the privatization process. With the complession of the privatization and sale of strategic facilities, telecommunications, electrical utility and Oil Company, since the beginning of 2000, the Greenfield investments in the Republic of Macedonia intensively grow, and they are a dominant form of investment capital.

In context of the FDI inflows, the Republic of Macedonia, compared to the countries in the region, is the last country in the success of attracting FDI. Foreign investors who have invested in the Republic of Macedonia were motivated for the most part from the extremely high profit of a small number of companies which guaranteed monopolistic market positions. With the entry of the CEE countries to the EU, and later Bulgaria and Romania, expected foreign capital from these countries to be diverted in SEE countries. But, the Republic of Macedonia has failed to seize this opportunity.

On the other hand, if we compare the success in attracting FDI and the potential for attracting FDI to the Republic of Macedonia, it can be concluded that the FDI inflow in the country is within its potential.

Namely, according to UNCTAD, the Republic of Macedonia is among the countries that have managed to attract FDI in the framework of its economic potential by four determinants for FDI, suggesting that FDI inflow in the

[11] UNCTAD (2011). Investment Policy Review: The former Yugoslav Republic of Macedonia, UN. http://unctad.org/en/PublicationsLibrary/diaepcb2011d3

country, although being low, is within its possibilities and potential based on the attractiveness of the market, the availability of cheap and skilled labor force, the wealth of natural resources and the level of growth of infrasctructure. Given this, a question arises as to how the Republic of Macedonia can improve its potential for FDI.

4. Motives and Determinants of Foreigh Direct Investment in the Republic of Macedonia

4.1. Methodology and data

In order to explore in more detail the reasons for venture capital in the form of FDI and he determinants of FDI inflows in the counry, and to recognize their effects in the country, which shall serve as a reference framework in defining future directions of policy related to FDI in the Republic of Macedonia, an empirical research has been conducted in the form of questionnaire. The reference framework to which the analysis is based represents OLI-paradigm of J.H. Dunning. The questionnaire consists of three parts.

The first part of the questionnaire, given the basic postulate of OLI paradigm that the formulation of operational hypotheses about the relationship between the individual OLI variables and the level of international production should clearly define the region (geographical structure), industry (sectoral structure) and companies, present the main feature of the foreign companies in the Republic of Macedonia being subject to study.

The secound part of the questionnaire refers to making a decision to invest in foreign companies in the Republic of Macedonia. In this section we explore the motives for investing and determinants of FDI in the Republic of Macedonia, which will serve as a reference framework in defining future direction of policy towards FDI in the Republic of Macedonia.

The third part of the questionnaire refers to the investment management. This part of the statistical analysis of the processed data supplements the analysis in the paper on FDI in the Republic of Macedonia. The questionnaire is filed to 26 foreign companies in the country, of which 17 companies, about 65%, has answered the questions. The results obtained by statistical processing and analysis of the responses given by the representatives of the foreign companies in the Republic of Macedonia.

The data obtained from the companies with the largest foreign capital in the Republic of Macedonia are a relevant sample in order to draw conclusions about the motives of venture capital and determinants of FDI inflow towards the development of future policies related to FDI in the country.

4.2. Results

In the race for FDI, transition countries seeking to attract foreign capital by creating national policies in line with the suggestions of the economic literature, while taking into account the experiences of countries that were an example of success in attracting FDI.

On the one hand the Republic of Macedonia has set the legal framework for FDI, on the other hand it offers a range of incentives to potential foreign investors. But the data regarding the weak inflow of foreign capital in the country show that apparently it is not enough.

The Republic of Macedonia can increase its potential for FDI by improving the locational and ownership advantages. In this context, the economic factors of the country are of particular importance, whose influence depends on the motives for investment.

Regarding the motives for venture capital, the results of the survey show that the greatest influence on the decision of foreign companies to invest in the Republic of Macedonia had the motive to conquer new market. In the ranking of distribution of the motive to conquer new market, 52.94% of foreign comapnaies have rated this motive with the greatest impact in making their decision to invest in the Republic of Macedonia (Table 1).

Table 1 - Motives influencing the decision of foreign companies to invest

Ranked impact	a.	b.	c.	d.
1	9 - 52,94%	4 - 23,53%	1 - 5,88%	5 - ,41%
2	3 - 17,65%	3 - 17,65%	7 - 41,18%	2 - 11,76%
3	1 - 5,88%	10 - 58,82%	5 - 29,41%	3 - 17,65
4	4 - 23,53%	/	4 - 23,53%	7 - 41,18%
TOTAL	17	17	17	17

Note: a. conquering new market; b. greater efficiency of capital engaged; c. resource seeking; d. looking for strategic products.

The Republic of Macedonia is a country wth a small market and low level of development, growth based on labor-intensive factors, poor technological capabilities and limited exported. Also, the Macedonian economy has a relatively liberal trade regime and regional cooperation.

In terms of the economic factors related to the market, in the era of globalization, the access to regional and global market has a major impact on the FDI inflow in the host country's capital. In this context, the openness of the country and the regional cooperation are of particular importance and indicate the level of integration of the economy in the regional and global economic trends.

This tendency is confirmed by the results of the survey. Namely, in the ranking of the economic factors associated with the market, the results show that the access to the regional and global market had the greatest influence on the decision of the foreign companies, being subject of research, to invest in the Republic of Macedonia (Table 2).

Table 2 - Impact of economic factors associated with the market

Ranked impact	a.	b.	c.	d.	e.
1	5 - 29,41%	6 - 35,29%	6 - 35,29%	9 - 52,94%	3 - 17,65%
2	5 - 29,41%	8 - 47,06%	10 - 58,82%	5 - 29,41%	5 - 29,41%
3	6 - 35,29%	2 - 11,76%	1 - 5,88%	3 - 17,65%	9 - 52,94%
No data	1 - 5,88%	1 - 5,88%	/	/	/
TOTAL	17	17	17	17	17

Note: a. market size; b. market development; c. market structure; d. access to regional and global market; e. specific consumer preferences in the country

Macedonia has a relatively open economy. The share of trade in GDP is around 80%.[12] The trade policy of the Republic of Macedonia is in accordance with the country's membership in the TWO, as well as with the Stabilisation and Association Agreement with the EU. Also, the membership in CEFTA has resulted in completing the network of bilateral free trade agreemenets with all Member States.

In context of the economic factors associated with the market, an important limiting factor for FDI in the Republic of Macedonia is the country's poor market growth. In this regard, the survey results obtained by ranking the determinants which negatively affect the operation of foreign companies in the Republic of Macedonia show that the poor market growth has a significant impact on foreign investors in the country (Table 3).

Table 3 - Determinants which negatively affect the operation of foreign companies

Ranked impact	a.	b.	c.	d	e.
1	7 - 41,18%	9 - 52,94%	5 - 29,41%	11 - 64,71%	5 - 29,41%
2	8 - 47,06%	6 - 35,29%	7 - 41,18%	4 - 23,53%	8 - 47,06%
3	1 - 5,88%	2 - 11,76%	4 - 23,53%	2 - 11,76%	3 - 17,65%
No data	1 - 5,88%	/	1 - 5,88%	/	1 - 5,88%
TOTAL	17	17	17	17	17

Note: a. Political instability; b. macroeconomic instability; c. unclear regulations and standards related to foreign investment; d. poor market growth; e. inadequate policy towards private enterprises and competition.

The resource seeking motive also has a significant impact on the decision of the foreign companies in the Republic of Macedonia. That is, according to the survey in the paper, the resource seeking motive had a significant impact on the decision to invest in the country in 41.18% of the foreign companies. (Chart 1)

The Republic of Macedonia is attractive for resource-seeking FDI, because of its relatively cheap labor, but it does have limited natural resources. The average gross salary in the Republic of Macedonia amounted 504 euros in 2014. The rate of unemployment in the country is 28%[13]. However, if we compare the Republic of Macedonia with other SEE countries, it turns out that the labor in the country is not the most competitive.

What is worrying is the fact that the unskilled labor largely takes place in the structure of the active population by education. Namely, 43% of the active population is uneducated or have not completed secondary education[14]. Also, the labor productivity is at very low level.

[12] Ministry of Finance of the Republic of Macedonia. http://www.finance.gov.mk/mk/node/401

[11] Vienna Institute for International Economic Studies. http://wiiw.ac.at/macedonia-overview

[14] State Statistical Office of the Republic of Macedonia. http://www.stat.gov.mk/PublikaciiPoOblasti

The economic literature confirms that the era of globalization and availability of skilled labor is of greater importance. In recent decades, the cheap labor force falls in the category of incentives for the foreign investors than motieves for investment.

This tendency is confirmed by the results of the survey in the paper. In the ranking of economic factors associated with the resources and capacities of the host countrie's capital, the available skilled labor had the strongest influence on the decision to invest in the Republic of Macedonia, i.e 64.71% of the foreign companies which are subject of the study. Also, the cheap labor had a strong influence on the decision to invest in the Republic of Macedonia in 58.82% of the foreign investors.

Also, the available innovative and technical capacities are of great impact. In the distribution of the ranking factors for 41.18% and 35.29% of foreign companies, the available innovative and educational capacities and the available technical capacities had significant impact on the decision ti invest in the country (Table 4).

Table 4 - Impact of economic factors associated with the host country's resources

Ranked impact	a.	b.	c.	d.	e.	f.
1	4 - 23,53%	10 - 58,82%	11 - 64,71%	3 - 17,65%	6 - 35,29%	4 - 23,53%
2	2 - 11,76%	5 - 29,41%	4 - 23,53%	6 - 35,29%	7 - 41,18%	6 - 35,29%
3	10 - 58,82%	2 - 11,76%	1 - 5,88%	7 - 41,18%	3 - 17,65%	7 - 41,18%
No data	1 - 5,88%	/	1 - 5,88%	1 - 5,88%	1 - 5,88%	/
TOTAL	17	17	17	17	17	17

Note: a. Low rental costs; b. cheap labor; c. available skilled labor; d available innovative and educational capacities; e. available technical capacities; f. good infrastructure.

In the era of globalization, the motive for greater efficiency of the engaged capital becomes more important. But, here we need to bear in mind the fact that this type of FDI is typical for the countries that have reached a certain level of economic development, suggesting that this motive has no significance in both the transition countries and the Republic of Macedonia.

These facts are confirmed by the results of the survey in the paper, according to which the motive for greater efficiency of the engaged capital for most companies, i.e 58.82%, had little impact on their decision to invest in the Republic of Macedonia (see Table 1).

The Macedonian example for efficiency-seeking FDI is the investments in TIDZ. In this context, the results of the survey in the paper on the impact of the motives for investing in the FDI structure shows that the motive for greater efficiency of the engaged capital had a major impact on the decision to invest in the country in 50% of the foreign companies from non-European countries, which actually refers to foreign companies that have invested in TIDZ.

In recent decades, the globalization has contributed to the decrease of the importance of traditional determinants of FDI inflow, while the importance of the so-called institutional infrastructure of the host country's capital is increasing compared to other factors. Hence, the creation of modern institution infrastructure is one of the necessary preconditions for joining the country's global capital flows.

The Republic of Macedonia and other transition countries, hav faced inefficient institutions stemming from the transition process. The lack of institutional quality infrastructure is an important limiting factor for FDI in the country. At the same time, the Republic of Macedonia has proved that it is quite difficilt to establish institutional stability. The poor mechanisms for implementation of the regulatory framework for the business sector and non-transparent operation, have significantly affected the inflow of foreign capital in the country. The bureaucracy and inefficient administration as a result of the transition are still present. Foreign investors face lengthy bankruptcy proceedings and unclear privatization, which means having the opportunity to corrupt activities in certain countries. At the same time, the judiciary still suffers from a lack of independence, as well as low operational efficiency.

The results of the survey in the paper confirm the importance of the institutional infrastructure as determinants of FDI in the Republic of Macedonia. According to the results, the strongest influence on the decision of foreign companies to invest in the Republic of Macedonia has the institutions' efficiency, in 35.29% of foreign companies and an average impact for the same percentage of companies (see Table 5).

Table 5. Impact of determinants associated with the business climate

Ranked impact	a.	b.	c.	d.
1	7 - 41,18%	4 - 23,53%	6 - 35,29%	5 - 29,41%
2	8 - 47,06%	9 - 52,94%	6 - 35,29%	8 - 47,06%
3	2 - 11,76%	4 - 23,53%	4 - 23,53%	3 - 17,65%
No data	/	/	1 - 5,88%	1 - 5,88%
TOTAL	17	17	17	17

Note: a.incentives for foreign investors; b. rule of law; c. effectiveness of institutions; d. services for realization of investment

At the same time, the results show that the greatest negative impact on the operation of the foreign companies has the failure tomeet the legal regulations (Table 6).

Table 6.Determinants which negatively affect the operation of the company

Ranked impact	i.	j.	k.	l.	m.
1	1 - 5,88%	/	5 - 29,41%	10 - 58,82%	4 -23,53%
2	6 - 35,29%	10 - 58,82%	8 - 47,06%	2 - 11,76%	5 - 29,41%
3	9 - 52,94%	6 - 35,29%	3 - 17,65%	3 - 17,65%	7 - 41,18%
No data	1 - 5,88%	1 - 5,88%	1 - 5,88%	2 - 11,76%	1 - 5,88%
TOTAL	17	17	17	17	17

Note: i. lack of innovative and educational capacities; j. lack of technical capacities; k. poor infrastructure; l. lack of legislation; m. existence of administrative FDI entry barriers.

In terms of the national policies associated with FDI, one of the main priorities are the political and macroeconomic stability of the host country's capital.

In the period after its independence, the Republic of Macedonia has faced a number of economic and political problems. The macroeconomic instability, hyperinflation and the high amount of inherited debt were one of the more difficult problems that the Macedonian economy has faced in the early 1990s. At the same time, the political and economic blockades, the sanctions of the Security Council of the UN against Yugoslavia, the Greek embargo against Macedonia, the war in former Yugoslavia, Kosovo crisis and the political and security crisis in the Republic of Macedonia also had a negative impact on the Macedonian economy.

In the Republic of Macedonia, the political stability was a key factor that negatively affected the inflow of FDI in the 1990s, but in the present days, as a candidate country for EU membership, it is unacceptable for the political stability to be deterrent to the FDI inflows into the country. However, it should be borne in mind that the Republic of Macedonia is in a relatively unstable region.

The Republic of Macedonia is a small country with a relatively low level of economic development. Also, the country has a relatively low inflation and stable exchange rate. Theaverageinflationratewasaround 3%.

The importance of the determinants related to national policies on FDI is also confirmed by survey results in the paper. Among them, the greatest influence on the decision of foreign investors to invest in the country has the political and macroeconomic stability. 58,52% of the foreign companies in the country that were subject of the survey have accessed that the macroeconomic stability had the strongest influence on their decision to invest in the country. The political stability had significant impact for 52.94% of the companies (Table 7).

Table 7. Impact of determinants related to national policy on FDI to the decision for investment in the Republic of Macedonia

Ranked impact	a.	b	c	d
1	4 - 23,53%	10 - 58,82%	4 - 23,53%	4 - 23,53%
2	9 - 52,94%	6 - 35,29%	6 - 35,29%	11 - 64,71%
3	3 - 17,65%	/	5 - 29,41%	1 - 5,88%
No data	1 - 5,88%	1 - 5,88%	2 - 11,76%	1 - 5,88%
TOTAL	17	17	17	17

Note: a. political stability; b. macroeconomic stability; c. privatization process; d. guaranteed private property and existence of a free competition

In terms to the legislation related to FDI, the Republic of Macedonia does not differ that much from other SEE countries. The Republic of Macedonia, as well as other transition countries, applies the principle of national treatment of FDI, i.e domestic and foreign companies are equally treated in the country. Free entry and establishment of foreign affiliates, as well as free transfer and repartition capital and profits are regarded as norms related to FDI in the transition countries and in the Republic of Macedonia. Also, the legisltation of the Republic of Macedonia gives directions under which foreign investors can invest in all sectors and areas of the country, with the expection of a few. The foreign investors have the right to own private property and the right to land ownership by way of registration of the company in the country.

In order to attract foreign capital, in 2007, the Republic of Macedonia has introduced a TIDZ model by adopting the Law on Technological-Industrial Development Zones.In recent years, most part of the Greenfield investments are realized exactly in the TIDZ.

Regarding the effects of incentives for FDI, the economic literature suggests that fiscal incentives have little impact on FDI inflows. This fact is confirmed by the survey results in the paper, according to which the “incentives for FDI” for the most of the foreign companies, i.e 47.06% had average impact on their decision to invest in the Republic of Macedonia (Table 5).

But, the effects of incentives are only visible if the country has reached a certain level of economic development. Incentives can not compensate for the shortages due to the poor progress in transition and structural reforms, nor can be a substitute for the unfavorable investment climate in the country. At the same time it should be taken into account the fact that the former transition countries that are now EU members had to review the most part of the incentives for FDI during the negotiations with the Union.

The Republic of Macedonia and other transition countries faces with inefficient institutions stemming from the transition process. The lack of institutional quality infrastructure represents an important limiting factor for FDI in the country. Also, in the Republic of Macedonia it has been proven that it is quite difficult to establish institutional stability.

The weak mechanisms for the implementation of the regulatory framework for the business sector, as well as for the non-transparent operations significantly affected the inflow of foreign capital into the country. Bureaucracy and inefficient administration as a result of the transition are still present. Foreign investors face lengthy bankruptcy procedures and unclear privatization, which means an opportunity for corrupt activities in certain countries. At the same time, the judiciary still suffers from a lack of independence, as well as low operational efficiency.

Conclusion

The Republic of Macedonia belongs to the group of countries that, in economic terms, find it hard to progress toward transition, while not suffitiently integrated into the global economic trends. In this context, it requires for economic changes that will include intensification of the development and inclusion of the country in the global economic processes through intenstive structural changes and a greater inflow of foreign capital. Hence, it is necessary to continuously adjust to the business environment in line with the world trends, but at the same time, the Republic of Macedonia should identify its own conditions and opportunities for attracting FDI in light of its rapid economic development.

The economic literature suggests that FDI can be a catalyst to the development of the country, but the extent and nature of the effects depends primarily on the absorbing capacities of the capital’s host country, which transforms FDI in economic development.

The Republic of Macedonia is a country with small market, low growth, low savings rate and relatively high level of indebtedness. It is obvious that the Republic of Macedonia needs foreign capital in light of its rapid economic development. But the data show that the Republic of Macedonia in the transition period has attracted a very small inflow of FDI compared to the countries of the region and the effects of foreign direct investments in the country were not as expected. Given this, a question arises as to the strategy that the Republic of Macedonia should develop in terms of foreign direct investments.

The analysis of FDI determinants in the Republic of Macedonia indicate several facts which transition countries have to take into consideration when creating their FDI related national policies.

In future, the Republic of Macedonia has to attract FDI that will affect the economic development of the country. The effects of FDI in context of the economic development of the country are insignificant, which is largely due to the weak progress in transition.

The FDI inflow is conditioned on the implementation of structural reforms in the period of transition and, in this context, on the level of the country's economic growth. The development of the market institutions is one of

the basic preconditions for attracting FDI. Also, the infrastructure development decreases the transport costs, which is especially significant for the potential foreign investors. In the last several decades, global changes have imposed the importance of the approach to the regional and the global market as a determining factor of FDI inflow, thereby making the openness of the country an increasingly necessary precondition for attracting foreign capital.

At the same time, the modern institutional infrastrcuture is one of the necessary preconditions for joining the country's global capital flows. In this context, it is necessary to eliminate the administrative barriers, which still represent a limitng factor for foreign ivnestors through institutional reforms. Also, improvement of the judiciary, as a guarantee of impartiality and equal working conditions, should be a priority.

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IS THERE EXCESS CAPACITY REALLY?

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Abstract:

Excess capacity is viewed as a distinctive feature and an essential inefficiency of monopolistic competition as the large-group case of imperfect competition. Using a simple geometrical approach and studying the demand and cost curves faced by the individual firm, we find that there is little potential for excess capacity in monopolistically competitive markets, opposite to the common perception and wide coverage in the literature. We see monopolistic competition as the true type of competition in the presence of transaction costs where perfect competition is a hypothetical and ideal benchmark which cannot exist under positive transaction costs.

Keywords: excess capacity, monopolistic competition, oligopoly, transaction costs.

JEL Classification: D23, D24, D43, L13.

1. Introduction

Excess capacity is viewed as a unique inefficiency of monopolistic competition as the "large-group" case of imperfect competition. Since Robinson (1933) and Chamberlin (1947) various "wastes" of monopolistic competition have been discussed. Some major sins of monopolistic competition mentioned are excessive advertising, selling costs, packaging, cross transportation, too much variety and lack of product standardization, too small or inefficient scale. The very idea of the inefficiency of monopolistic competition is enhanced by Chamberlin and Robinson who treat monopolistic competition as imperfect, implying thus its inefficiency. According to Klein (1960) Chamberlin (1947) gives an implication that imperfect competition causes inefficiency in economic organization and thus gives rise to excess capacity. Klein (1960) also notes that economic analysis is replete with use of the term capacity, but comparatively little attention is devoted to a precise theoretical statement of the concept or the measurement of capacity.

Such a harsh treatment of monopolistic competition perhaps originates in the fact that Chamberlin wrongly merged two concepts, monopoly and competition, to the extent that contemporary students perceive monopolistic competition as a form of monopoly. Chamberlin (1952) claims that his book arouse out of the "attempt to combine the two theories of monopoly and of competition into a single one which would come closer to explaining the real world, where, it seemed the two forces were mingled in various ways and degrees." In his own attempt to blend monopoly and competition, the marginal revenue curve was seen as a piece of pure technique unrelated to thecentral problem. Chamberlin, on the one hand, assumed that monopolistic competition shares the features of monopoly but, on the other, perceived the demand curve of the monopolistically competitive firm as very flat. In his response to Nichol Chamberlin reaffirms that he himself has "described the typical curve as highly elastic" (Nichol 1934). That Chamberlin had no clarity on the distinction between monopoly and monopolistic competition becomes evident from his discussion of advertising in the two types of market structures:

"And although advertising is inevitably linked to monopoly in the sense that it could not take place under pure competition, it is a perfect illustration of the paradox of "monopolistic competition": it is a leading means whereby monopolists compete with each other". (Chamberlin 1952)

Chamberlin seems to confuse oligopoly with monopolistic competition attributing advertising to monopoly and equating perhaps "the small-group" case with the "large-group" case when it comes to advertising. While today there is excessive advertising in oligopolistic industries, both monopoly and monopolistically competitive firms rarely resort to advertising. Monopoly does not normally advertise due to the absence of competitors and, hence, the lack of need for advertising. Monopolistically competitive firms advertise on a small scale being unable to afford mighty advertising campaigns. Monopolistically competitive firms which succeed in differentiating their product sufficiently through the means of promotion and advertising have the potential to grow into oligopolistic firms engaged in deeper advertising wars.

Excess capacity is still being taught in undergraduate economics classes as an inefficiency of monopolistic competition. It is also heavily explored in economic literature and economic research, whereby sophisticated dynamic optimization models are used to study the notion of excess capacity as a weakness of monopolistic competition. Monopoly and oligopoly are rarely referred to as sources of excess capacity. At the same time, there is the tendency in neoclassical economics to emphasize the inefficiency of monopolistic competition at the expense of the cost-economizing effects and economies of scale associated with market power. Monopoly and oligopoly are presented as attractive on account of economies of scale and lack of idle capacity, while monopolistic competition is condemned as socially inefficient and suboptimal. Ignoring transaction costs, firms with market power are much praised and justified on various grounds, while imperfectly competitive firms are considered undesirable. Since in reality perfect competition is hardly attainable and monopolistic competition as the real form of competition has shortfalls, excess capacity is a reason why markets should be organized along the "small-group case" of oligopoly or along monopoly.

Accounting for positive transaction costs, this paper aims to rehabilitate monopolistic competition on account of the existence, or rather non-existence, of excess capacity. Using a geometrical approach, we find that there is little or insignificant excess capacity with monopolistic competition, its much stated shortfall. We thus see monopolistic competition as the true form of competition in the real world of positive transaction costs where consumers demand some variety. Questioning the existence of excess capacity with monopolistic competition we study the demand and cost curves faced by the typical firm in a given market. The excess capacity of monopolistic competition does not exist or is insignificant because: 1) the demand curve faced by the monopolistically competitive firm is flat as opposed to that of monopoly and oligopoly, 2) the envelope long-run average cost curve of the monopolistically competitive firm is likely to be steeper, not flatter, than that of a firm with market power.

Other scholars have also questioned the existence of excess capacity in monopolistically competitive markets. Some find general shortfalls in the concept of excess capacity. Nichol (1934) argues that a discontinued demand curve for the individual firm will not give rise to excess demand. Harrod challenges the free-entry principle adopted by Robinson and Chamberlin by which "firms in imperfect competition would find equilibrium at a point where their [average] total cost curve had the same downward slope as the demand curve with which they were confronted (point of tangency)". (Kerr and Harcourt 2002)

Harrod maintains that the entrepreneur will plan equipment accordingly, that is, "on a scale that gives the lowest cost for producing what he can sell at such a price, and, having acquired the equipment, will sell at that price". (Harrod 1952) The entrepreneur will choose a plant which avoids excess capacity and will plan to charge a price yielding a normal profit (1952). Archibald (1967) distinguishes between excess capacity measured in terms of average production costs and that under average total costs, those of producing and selling. Using mathematical techniques, Dixit and Stiglitz (1977) incorporate product diversity in monopolistic competition and find that monopoly power does not distort resources and enables firms to pay fixed costs.

Our study gravitates around the second group of scholars who evaluate the demand and cost curves of monopolistically competitive firms. In real terms perfect and monopolistic competition are identical which eliminates the possibility for excess capacity. Nicols (1947) does not find essential differences between the competitive equilibrium and the Chamberlin-Robinson equilibrium except that "consumers distinguish between products of the same general class" where Robinson (1933) recognizes that while large numbers are likely to be realized, "the existence of a perfect market is likely to be extremely rare in the real world." Nicols also finds that many of the cases treated by Chamberlin and Robinson are actually oligopolistic or monopolistic situations (Nicols, 1947).

To the extent that the two professors discuss firms with market power, excess capacity appears to be a problem of monopoly and oligopoly rather than perfect monopolistic competition. Schumpeter (1939) and Machlup (1939) both suggest that perfect and monopolistic competition differ in nothing else but product differentiation and

that the case of “differentiated products without oligopolistic groupings… would not be much different from that of pure competition” (Machlup, 1939). Nutter (1955) finds that varieties are “pure” substitutes for each other even though they may not be “perfect” substitutes. Thus, although differentiated, products sold in monopolistically competitive markets are not essentially different.

Demsetz (1982) has argued that product differentiation, economies of scale, and capital cost differentials create entry barriers because of the costs of information. Patents and trademarks serve as entry barriers, while consumers view huge investments in fixed capital and sunk costs as commitment to quality. All these increase the market power of the firm. Demsetz (1959) demonstrates that excess capacity is not a necessary implication of the assumptions underlying Chamberlin’s model. He correctly observes that keeping the assumption of product differentiation forces the problem into the structure of monopoly, natural monopoly or “the never-never land of oligopoly,” while keeping the free-entry assumption forces the problem into the competitive frameworks. (Demsetz 1972)

Baumol (1964) discusses that in the narrow sense of the excess capacity theorem the typical company’s demand curve may plausibly be expected to be quite flat and excess capacity correspondingly insignificant. The excess capacity theorem suggests that the same total output would be produced more efficiently and at less cost by a smaller number of firms[15]. Discussing the social costs of standardization, Baumol observes that if the number of firms in the industry is reduced, the variety of products available to consumers must fall. The resulting saving in resources is then to be considered a net gain depending on the case and the excess capacity theorem represents a real social cost only if the total physical costs increase more than the increased choice for consumers. (Baumol 1964)

2. The demand curve of the monopolistically competitive firm

A firm which produces at full capacity is one operating at the lowest point of its long-run average total cost curve .By definition, the further to the left of this minimal point the firm is, the more idle capacity there is in the operations of the firm. Thus a perfectly competitive firm is presumed to operate at full capacity since in a long-run equilibrium its demand curve is just tangent to the envelope curve exactly at the minimum point of capacity output, that is, the optimal scale of production. Due to its very nature of a price taker the individual perfectly competitive firm faces a horizontal demand curve. Monopoly and oligopoly face negatively sloped demand curves but are not normally seen as sources of excess capacity because they do not typically produce at the tangency point of price and average cost. These two market structures are said to explore economies of scale fully, preventing thus idle capacity. The argument of the efficiency of monopoly power on account of large size and economies of scale and scope undermines its high social costs, including deadweight social loss, monopoly rents, rent-seeking, along with price discrimination, X-inefficiency, etc.

Monopoly and oligopoly have steep demand curves with monopoly having the steepest demand curve of all market structures due to the fact that the monopoly firm captures the entire market demand andconsumerslack any substitutes or viable alternatives. In theory the demand curve of a monopoly firm serving a particular market is steeper than the individual demand curves of two or three oligopolists which could potentially serve the same market, though all firms will have relatively steep curves. The monopoly demand curve also is much more extended to the right in comparison with any other firm since it is the entire market demand the firm captures.

The flatness of the demand curve for monopolistic competition is the key for the discussion of excess capacity. How flat the demand curve is, in effect, determines the magnitude of excess capacity, with a flat demand curve producing almost no excess capacity at the same cost structure and a steep demand curve causing significant excess capacity for the individual firm. Chamberlin, on the one hand, assumed that the monopolistically competitive firm resembles monopoly in that it has market power. At the same time, he perceived the demand curve of the monopolistically competitive firm as very flat and has “described the typical curve as highly elastic”. (Nichol 1934)

This contradiction in Chamberlin’s theory results from his wrong presumption of the market power of the monopolistically competitive firm .As long as this assumption is kept, the monopolistically competitive firm

[15] Baumol writes: “The excess capacity theorem is not a statement about the desirability of the allocation of resources among industries. It does not say that there will be too little produced by an industry (however defined) whose products are differentiated. Rather, the theorem tells us that the organization of the "industry" into firms is apt to be wasteful. It suggests that the same total output if produced by a smaller number of more sizable firms, can be provided at a lower real cost per unit, and hence a smaller total use of society's scarce resources.”

appropriates the features of oligopoly and the theory is valid. But as soon as the assumption of market power is dropped, the monopolistically competitive firm appropriates a very flat demand curve and excess capacity tends to disappear.

The contradiction is embedded in the fact that market power is associated with barriers to entry of one type or another and presents itself in a very negatively sloped and extended demand curve. Barriers to entry, associated with monopoly and oligopoly, lead to 1) a very steep demand curve, and 2) large demand as shown by a much extended demand curve. Free entry, that is, free competition causes 1) a very flat demand curve, and 2) very low demand with a demand curve much closer to the origin of the coordinate system. With free entry monopolistic competition is likely to resemble perfect competition, that is, a very flat and very low demand curve closer to the origin having a slightly negative slope rather than the steep demand curve of the oligopoly. Chamberlin's and Robinson's confusion stems from the fact that they attribute market power to the monopolistically competitive firm, as if there are barriers to entry, but when it comes to the tangency point, they assume free entry as in perfect competition. Mixing up free entry with a very steep demand curve is theoretically incorrect. Mixing up market power with free entry and competition was the major reason why the mistaken belief of excess capacity was formed.

In "The Rehabilitation of Pure Competition" Nicols (1947) claims that where small numbers exist, demand is limited regardless of product differentiation which is significant only when the number of substitutes is small. When there are many substitutes available to consumers, "the intensity of attachment for any one product decreases in very much the same manner described by Chamberlin in shifting of the straight-line… to the left... The elasticity should increase since it is possible to get a better substitute when the number of alternatives is greater." (Nicols, 1947).In oligopolistic competition product differentiation is essential in building market power because consumers have few alternatives to choose from.

But in monopolistic competition the assumption of free entry cancels the effect of product differentiation and product differentiation alone cannot provide market power to the individual firm. Without barriers to entry demand is limited for the firm although it resorts to product differentiation. Not only does the demand curve shift left, despite the existence of product differentiation, but the free entry principle flattens the demand curve substantially. The availability of many substitutes reduces consumer loyalty. Opposite to oligopoly where due to few alternatives and branding consumers build loyalty, in monopolistic competition consumers are indifferent and Robinson (1933) seems to be in agreement with these effects:

"…the difference, from the point of view of buyers, between any one firm and the next would thus be reduced, the customers of each firm would become more indifferent, and the elasticity would be increased."

Monopoly is not normally associated with excess capacity since it takes the entire market demand assumed to be large enough to explore the full potential of scale. Furthermore, the monopoly firm is not expected to advertise due to the lack of competitors. Figure 1 illustrates this effect – at sufficiently large market demand monopoly faced with the D_m demand curve causes no excess capacity. But similar is the effect for the monopolistically competitive firm as reflected by its demand curve D_c. While the demand curve of the monopoly firm is very steep and quite extended up and to the right due to the absolute market power of the firm, the demand curve of the monopolistically competitive firm is very flat and low, much closer to the origin of the coordinate system. Both firms operate under the same cost structure, using the same technology, production function and cost curves. If, *ceteris paribus* (that is, same envelope $LRAC$),the industry were organized along any of the two alternatives, a monopoly firm or a group of monopolistic competitors each faced with demand D_c, there would hardly be excess capacity with either market structure. Monopoly would not cause excess capacity due to large-scale production; likewise, as Figure 1 illustrates, there would barely be excess capacity with monopolistic competition due to free entry and the insignificant slope of the demand curve. Monopolywould be more costly to society though with a considerably higher price and lower quantity produced of the product.

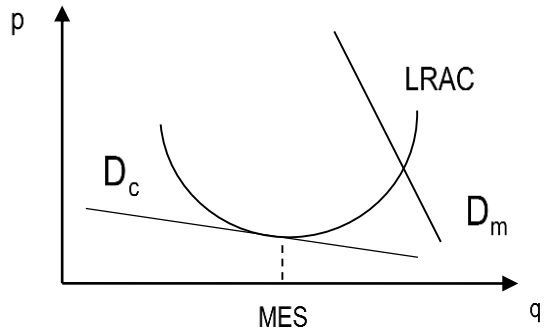


Figure 1 - Monopoly versus monopolistic competition

In rare situations a monopoly might cause excess capacity. This would likely be the case in a small country where market demand is limited relative to the costs of the firm. Figure 2 represents a monopoly for which limited demand causes excess capacity. The firm is profit maximizing, presumably producing where marginal revenue equals marginal cost at price p_m, and realizing positive economic profits since price exceeds average cost in a section of the envelope curve. Yet, the monopoly produces way to the left of the minimum efficient scale and the capacity output - at the price p_m the average cost is higher than the minimum. The idle capacity at the profit-maximizing point is greater than that at the breakeven point for the firm and even more significant than what the competitive outcome could provide for. The monopoly would also give rise to excess capacity if faced with higher average costs. This would be the case with an expensive production technology or poor management leading to an elevated LRAC curve.

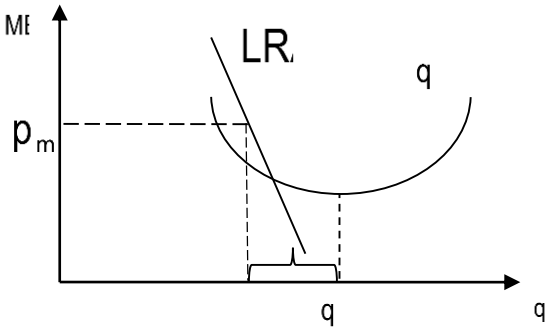


Figure 2 - Monopoly facing excess capacity

The excess capacity caused by monopoly increases the more expensive the technology and the more costly it is to organize the production process. Figure 3 illustrates that a higher envelope curve is associated with greater excess capacity, a result which follows from the steep demand curve of the monopoly D_m.

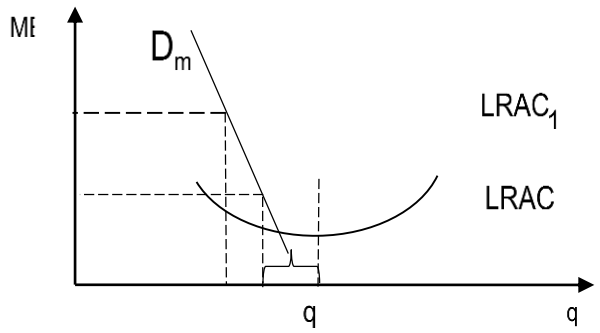


Figure 3 - Monopoly under different cost structures

Excess capacity is marginally small with monopolistic competition where the perfectly competitive firm, taken as a benchmark, operates at the minimum efficient scale. Figure 4illustrates that the flatter the demand curve of the monopolistically competitive firm, the more insignificant the excess capacity. The perfectly competitive firm operates at MES and, hence, a demand curve with a zero slopes. The demand curve D_c of the monopolistic competitor would be steeper 1) the more he succeeds in differentiating his product in the market relative to other existing products, 2) the more he uses the elements of the promotional mix (particularly advertising and sales promotions) and the means of marketing, 3) the fewer the substitutes available on the market, 4) the smaller the number of firms in the industry. Alternatively, the demand curve would be flatter 1) the less successful the product differentiation undertaken by the monopolistic competitor is, 2) the less effort he invests in differentiating his product, 3) the more and closer substitutes there are available on the market and 4) the larger the number of firms in the industry. Some products in monopolistically competitive markets are totally non-differentiable enjoying thus a very flat demand curve as D_c in Figure 4. In a survey Sutton (1991, p. 566) reports that salt, sugar, bread, flour, canned vegetables and processed meat resemble homogenous industries where little advertising happens. At the same time, some other products are more differentiable with a steeper demand curve such as D'_c. Sutton found some imperfectly competitive industries such as ready-to-eat cereals, margarine, soft drinks, instant coffee, beer and pet foods to be quite advertising-intensive.

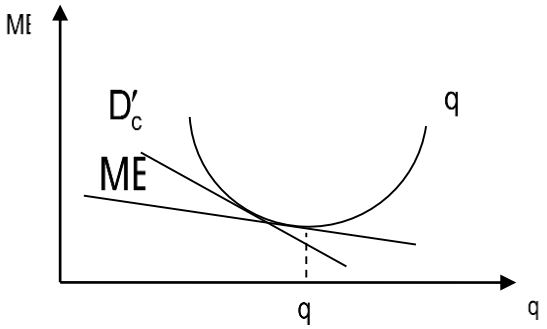


Figure 4 - Monopolistic competition with different degrees of product differentiation

Because of the availability of close substitutes, the price-setting power of the monopolistically competitive firm is quite limited. Monopolistic competition is characterized by many firms producing similar though differentiated products in a market with easy entry and exit. Since the demand curve is relatively flat, the marginal cost does not lie much below price at the point of optimum and the market power of the firm in terms of the Lerner index is low. Therefore, $L = \frac{p - MC}{p}$ is close to 0.

Both firms in Figure 4 are monopolistically competitive and lacking market power. The long-run equilibrium setup adopted by the classical economists negates the concept of excess capacity further. Since these are long-run demand curves, they are seen as very flat, much flatter than the short-run demand curves faced by these two

firms. As more and more substitutes enter the industry and consumers find cheaper and more suitable alternatives, the effect of product differentiation tends to fade away leaving the individual firm with little idle productive capacity. As can be seen in Figure 5, convex demand also reduces the potential for excess demand. Increased elasticity at greater units of output sold brings the firm nearly at the optimal scale of production.

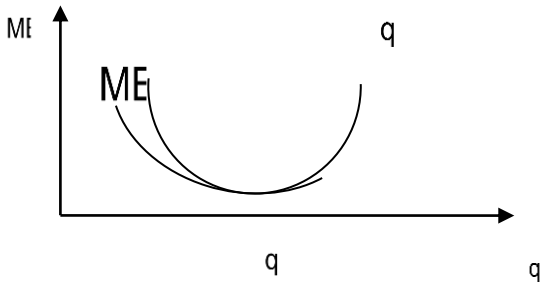


Figure 5. Monopolistic competition with convex demand

Advertising turns out to be an essential factor in the treatment of imperfectly competitive markets and the distinction between monopolistic and oligopolistic competition. As an element of the promotional mix of the firm, advertising helps the firm to differentiate its product and gain market power. Advertising acts as a barrier to entry and, at the same time, represents fixed costs for the individual firm extending thus the optimal scale of operations. Advertising is in this unique – it can change both the demand curve and the cost structure of the firm. Figure 6 illustrates advertising and a non-advertising company. The firm with the demand D_c is part of a highly competitive market and does not advertise. Consumers view its product as identical to those of other firms. Firm D_o emphasizes product differentiation by means of advertising. Advertising makes its demand curve steeper but also shifts it right bringing thus market power to this second firm. The use of advertising could potentially turn the monopolistically competitive firm ("the large-group case") into an oligopoly ("the small-group case"). Thus an oligopoly could arise of a monopolistically competitive firm which advertises heavily. With a large-scale, expensive advertising campaign a monopolistically competitive firm can shift its demand curve from D_c to D_o and turn into an oligopolist. An imperfectly competitive firm producing a unique product with no close substitutes is likely to patent it and prevent entry as well.

A monopolistically competitive firm producing a general product with many close substitutes in an industry with free entry and intense competition cannot easily carry out a magnificent advertising campaign. Due to its limited profit-making potential, small demand and low markup a monopolistically competitive firm can hardly afford massive advertising. A modest advertising budget cannot cause a significant rotation of the demand curve to the right from D_c to D_o. Thus most advertising happens within oligopolistic firms. They have the ability to advertise heavily and engage in destructive advertising wars as part of the behavior of strategic reaction but destructive advertising also raises their average costs. Advertising makes the demand curve of the individual firm steeper and extends it to the right increasing thus demand and building brand loyalty. Consumers perceive the product as unique, serving a unique purpose and not having close or distant substitutes. But advertising also acts as fixed costs for the firm, shifting its envelope curve up and to the right. In this new situation, the oligopoly becomes socially costly, creating a huge potential for excess capacity and increasing total costs due to heavy and unnecessary advertising.

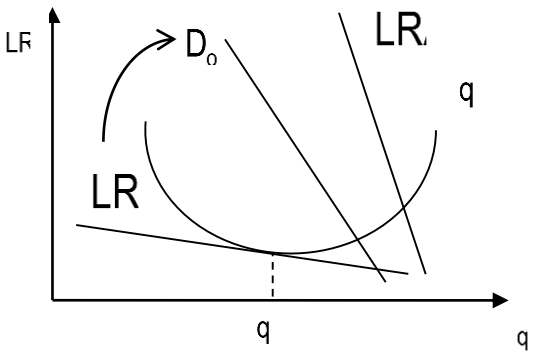


Figure 6 - The monopolistically competitive firm with and without advertising

In Figure 7 the heavy advertising the oligopoly undertakes raises its costs significantly. Since advertising acts as fixed costs, the new envelope curve $LRAC'$ has its minimum to the right of the minimum of the original $LRAC$ without advertising, that is, the optimal scale of operations is extended to the right. An advertising oligopoly thus operates at significant excess capacity and increased minimum efficient scale from the competitive level MES to MES'.

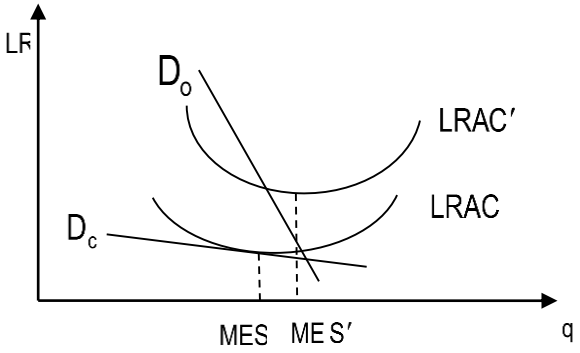


Figure 7 - An advertising oligopoly

3. The cost structure of the monopolistically competitive firm

Somewhat similar to advertising would be the effect of the X-inefficiency and managerial slack. Due to its market power, the oligopoly is subject to increased administrative and managerial costs which shift the average cost of the firm up to the level of $LRAC_m$, as shown in Figure 8. Theoretically X-inefficiency does not increase the optimal scale of operations since it only brings up the envelope curve in a parallel fashion.

However, for firms with market power faced with very steep demand curves, a parallel shift of the enveloped curve results in excess capacity. For the same negatively sloped demand curve for the firm, the greater the magnitude of X-inefficiency and the less efficient the management, the higher the envelope curve and the greater the potential for excess capacity. Competitive firms have very flat demand curves but cannot be seen with X-inefficiency, operating thus at low long-run average costs. In Figure 8 the competitive firm has a low and flat demand D_c but is also faced with relatively low average costs $LRAC_c$. At the same time, oligopoly D_o and monopoly D_m have larger demand but are subject to X-inefficiency. At the competitive level of costs $LRAC_c$ the oligopoly does not create excess capacity and scale is fully exploited. But when X-inefficiency is introduced, oligopoly becomes an essential source of excess capacity. The new $LRAC_m$ envelope curve allows the oligopoly to breakeven at a point much to the left of minimum LRAC and capacity output. Subject to inefficient management, managerial slack, wasteful use of resources due to market power, poor organization and coordination of production, oligopolistic and monopolistic firms can cause serious inefficiency in terms of capacity.

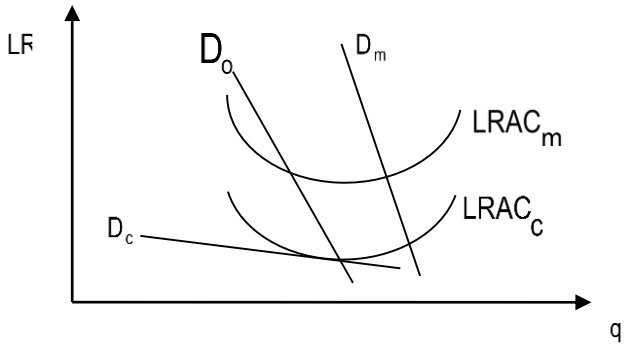


Figure 8 - Monopolistic competition versus X-inefficiency

Firms which fail to innovate and improve their production technology are also likely to face a higher LRAC curve and, therefore, excess capacity. Except the efficiency of management, a given LRAC curve reflects the level of technology used in the production process. While a competitive entrepreneur would be enticed to consistently improve technology with the purpose of lowering average costs and in view of the possible threat of entry by other firms, a monopolist has less incentive to lower his LRAC curve and adopt a new, improved technology similar to what Figure 8 shows. Monopolistically competitive firms have great incentives to innovate and advance their production technologies or choose technologies and technical processes which are cost-efficient and cost-reducing. Part of this is to prevent entry, part is to respond to intense competition and part of it is to increase profit in an industry which offers a very low profit-making potential. Hence, the average cost curve of the monopolistic competitor is likely to be lower than that of the monopolist. The competitor charges the lowest price and produces the greatest production volume at minimum inefficiency possible.

This discussion reveals that excess capacity is more likely to arise in oligopoly rather than in monopolistic competition. Oligopoly is a good host for excess capacity because 1) the demand curve the oligopolist faces is quite inelastic due to intensive advertising with a strongly differentiated product where advertising expands capacity output and minimum efficient scale; 2) the demand of the oligopolist and his share of the market are lower than those of monopoly, therefore, likely lying closer to the tangency point with the LRAC cost curve; 3) the oligopolist is subject to X-inefficiency and inefficient management unlike monopolistic competition; 4) the oligopolist has less incentive to innovative relative to the monopolistic competitor. Grounds for excess capacity to arise with monopoly are X-inefficiency and failure to innovate in a sufficiently small market. Both monopoly and oligopoly charge a significantly higher price and produce much lower output than a monopolistic competitor.

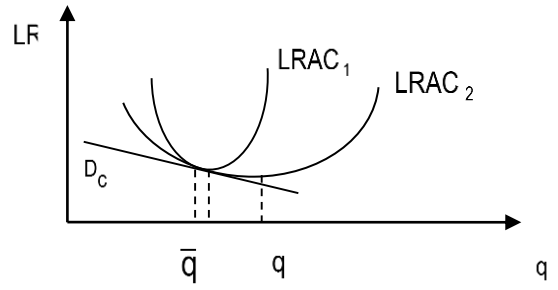


Figure 9 - Monopolistic competition under different cost structures

Figure 9 shows $\bar{q}$ as a tangency point for both a steep average-cost curve such as $LRAC_1$ and a flatter one like $LRAC_2$. Along the same demand curve of a firm, excess capacity is marginally small with a steep average-cost curve such as $LRAC_1$ and significant with a flatter $LRAC_2$. Thus, whereas a flatter demand curve reduces the potential for excess capacity, a very flat average cost curve increases it. Being in a long-run equilibrium the monopolistically competitive firm will face a flatter envelope curve compared to a short-run one but all costs in the long run would be variable costs. Curve $LRAC_2$ provides essential advantages to scale, whereas $LRAC_1$ does

not. In competitive markets entry is possible on a small scale and economies of scale are small relative to the size of the market.

This determines a large number of sellers, each with a small share of the market. Likewise, there are many buyers demanding small amounts of the product on the respective market. Contrary to competitive markets, in industries with market power economies of scale are extensive and entry is justified on a large scale so that to produce at lower unit cost. A new entrant requires a significant market share and monopolistic and oligopolistic industries with few participants in them are likely to be those with expanded envelope curves.

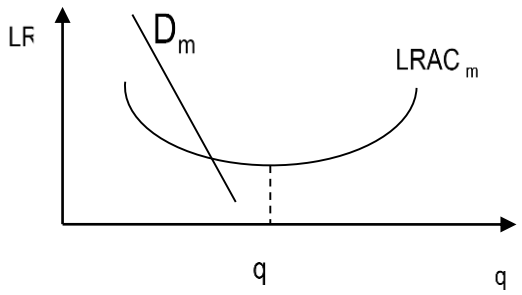


Figure 10 - Monopoly's typical cost structure

Figure 10 shows an industry with room for only one firm due to extensive economies of scale. The specific technology and cost structure prevent entry on a small scale which favors only one or few large firms. A natural monopoly, faced with continuously falling long-run average costs, benefits from scale, too. Natural monopolies such as public utilities where most of the investment is in the form of initial, setup costs are examples of how technology favors a few large firms in the sector (Figure 11).

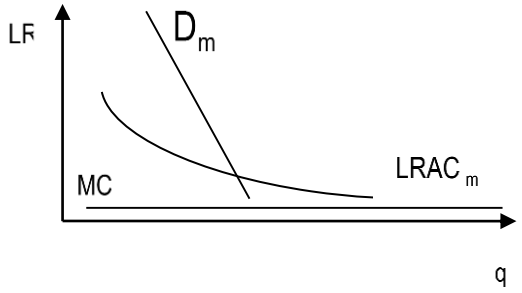


Figure 11 - A natural monopoly

What are some determinants of scale which shape a particular industry? Some distinguish between economies of scale and returns to scale where the former are related to the cost of organizing production and the size of the firm relative to that of the market, while the latter reflect the technology the firm utilizes.[16] Scale can be measured by the index of scale economies

$$S = \frac{AC(q)}{MC(q)}$$

In the stage of economies of scale, as depicted in Figure 12, the index is $S > 1$ since average cost exceeds marginal cost. Consequently, for constant returns to scale at capacity output q_c (Figure 12), $S = 1$, and $S < 1$ for diseconomies. Differentiating average cost with respect to output,

$$AC(q) = \frac{TC(q)}{q}$$

[16] We use economies of scale and returns to scale as synonyms throughout this paper.

$$AC'(q) = \frac{TC'(q)q - TC(q)}{q^2} = \frac{MC(q)}{q} - \frac{AC(q)}{q} = \frac{MC(q) - AC(q)}{q}$$

At the capacity output q_c we have $MC(q) = AC(q)$. Furthermore,

1) $MC(q) < AC(q)$, $AC'(q) < 0$ - economies of scale;

2) $MC(q) = AC(q)$, $AC'(q) = 0$ - neither economies, nor diseconomies;

3) $MC(q) > AC(q)$, $AC'(q) > 0$ - diseconomies of scale.

For the second derivative,

$$AC''(q) = \frac{\left[MC(q) - AC(q)\right]' q - \left[MC(q) - AC(q)\right]}{q^2} = \frac{MC'(q) - AC'(q)}{q} - \frac{AC'(q)}{q} = \frac{MC'(q) - 2AC'(q)}{q}$$

At the stationary point we have $AC'(q) = 0$, so the second derivative should be positive for a minimum

$$AC''(q) = \frac{MC'(q)}{q} > 0$$

At the point of intersection with average costmarginal cost should be positively sloped.

$$AC'(q) = -\frac{AC(q) - MC(q)}{q}$$

From the first derivative we see that at a given volume of production there is a steeper long-run average cost curve, that is, smaller economies of scale, the larger the distance between average total and marginal cost. If every next unit is much cheaper to produce than the average and marginal cost rises quickly, then the firm will not benefit from scale. The closer marginal cost is to average cost, the greater the scale economies and the more likely the firm is to benefit from scale expansion. Graphically this is represented by Figure 12.Additionally, with a specific quadratic form of the average-cost function we have

$$AC(q) = aq^2 + bq + c$$

$$AC'(q) = 2aq + b$$

$2aq + b = 0$ at MES and capacity output $q_c = -\frac{b}{2a}$.

$AC''(q) = 2a > 0$, where $a > 0$ for a minimum of average costs and for positive output ($b < 0$).

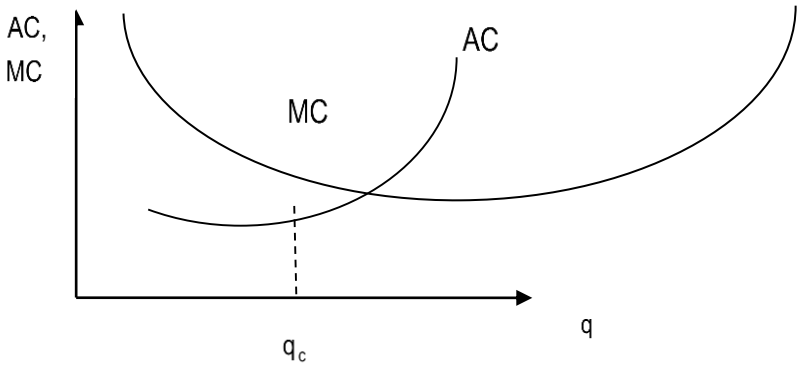
A higher value of a eliminates the potential for excess capacity, ensuring a steeply falling long-run average cost curve as shown by AC_2 in Figure 12. A lower value of a opens the potential for excess capacity. This parameter could be viewed as a scale factor or a scale parameter which determines a quickly or slowly falling envelope curve. At the same value of output q and the parameter b, a higher scale factor a guarantees a steeper slope $AC'(q)$ and entry on a small scale.

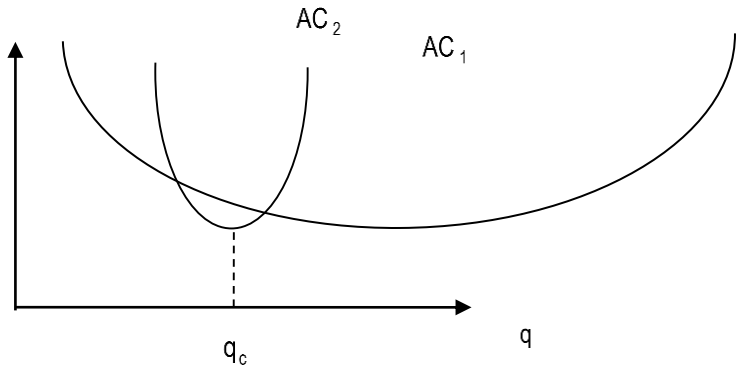
From the result $AC''(q) = \frac{MC'(q)}{q}$ we deduce that a rapidly rising marginal cost curve at the point of capacity output implies a high scale factor a and consequently entry on a small scale. A lower value of the scale

parameter, on the contrary, means relatively flat LRMC and LRAC curves and allows entry on a large scale. What is the scale factor a reflective of?

Scale economies are often associated with indivisibilities, high fixed costs, high setup costs, highly specialized inputs, high volumetric returns to scale, etc. Indivisibilities result from the impossibility to scale inputs up or down where large firms have an advantage over small ones. With indivisibilities a low scale factor a results from the technology used which does not allow changing the quantities of inputs easily and forces firms to produce on a large scale. Large firms are often faced with indivisibilities, substantive fixed costs, setup costs and administrative costs which increase minimum efficient scale. The presence of huge fixed costs enlarges the optimal scale of operations and causes a low scale factor. The management of huge corporations represents a heavy share of the fixed costs of the firm. High setup costs play the role of natural barriers to entry as is the case with natural monopolies or oligopolies.

At the other extreme are productions in which inputs are highly variable, can easily be scaled down or up in response to the needs of the market and there are low setup costs involved in starting up production. A high scale factor results from the fact that mostly variable inputs are employed in the production process. The variable component prevails over the fixed one. Such industries are characterized by the absence of indivisibilities, low fixed or setup costs, and easy entry. These are also likely to be contestable markets due to the lack of sunk or setup costs.





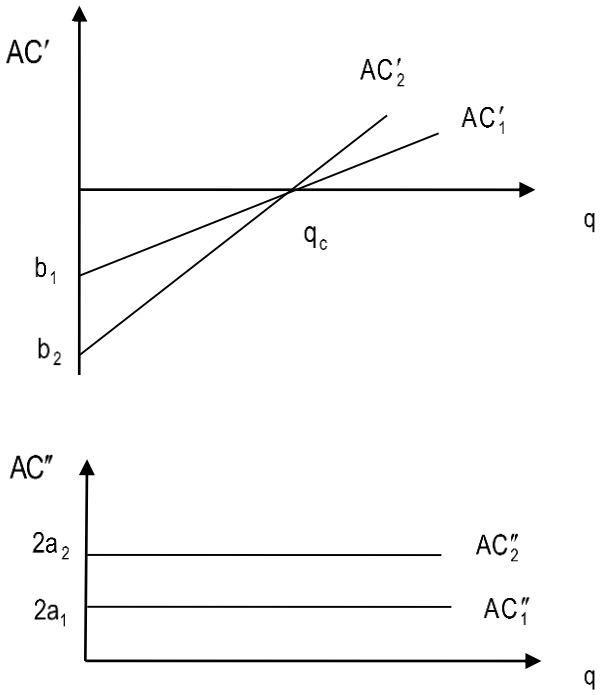


Figure 12 - Long-run average costs and the scale factor

Such businesses are characterized by both easy entry and easy exit. More often than not firms whose costs are recoverable and whose inputs could be used in alternative uses are competitive industries in which costs are mostly variable and represent the costs of providing variety. Compared to oligopoly, monopolistic competition faces a modest marketing and advertising budget. There are no significant costs of setting up the business compared to the colossal costs associated with natural monopolies or oligopolies; hardly any large-scale research and development take place within those small firms. Similar to perfect competition, most monopolistically competitive firms are run by a sole proprietor or a small management team so administrative and managerial costs are minimal.

Monopolistically competitive firms rarely use highly specialized labor and machinery unlike monopolies where the type of technology often necessitates the use of highly specialized capital. Monopolistically competitive firms for the most part use general-purpose equipment which is cheaper to buy at the outset. Monopolistically competitive firms are faced with both relatively flat demand curves and long-run envelope curves steeper than those associated with monopoly and oligopoly. In its various traits the monopolistically competitive firm resembles the ideal perfectly competitive bench mark more than it resembles oligopoly as a form of imperfect competition.

On the issue of scale Harrod (1952) maintains that the entrepreneur will plan equipment accordingly and will choose a plant which avoids excess capacity. To respond to the needs of a highly competitive market the manager-entrepreneur will not choose a clumsy, large-size production that cannot be scaled up easily. Rather he would choose a flexible technology and one or several small plants that provide for a high scale factor a . We have also demonstrated that in the absence of substantive fixed costs, the long-run average cost curve of the individual firm is likely to be steeper than that of monopoly or oligopoly .In the conditions of fierce competition the monopolistic competitor would have an inclination to sell at the lowest cost possible. Under a relatively steep envelope curve such cost minimization and a substantive cutting of price cannot occur at a volume of production much lower than the capacity output.When choosing equipment and plant size the manager might also plan for some reserve capacity in cases of excessively high and rising demand in a dynamically changing market environment. Such “safe” or spare capacity which is unused but might serve a good purpose if demand increases suddenly may wrongly be interpreted as an inefficiency of monopolistically competitive firms.

In selling differentiated products monopolistic competitors are often driven by fashion, rapidly changing styles, tastes, customs and trends. Providing variety is not possible without a significant variable component. Inputs such as different colours, dyes, ingredients, components or moulds necessary to produce different models, sizes, shapes, styles, flavours, textures, etc. are primarily variable inputs. The costs of providing variety thus are mostly variable costs and variety and product differentiation result from the use of variable inputs. It is variable inputs and flexible technology that shape the cost structure of firms in competitive industries. Interesting is Stigler’s observation on the clumsiness of large firms in providing variety:

“This source of inefficiency of large size is given little weight in the popular literature: size is almost equated with efficiency. Yet, anyone who watches a line of automobiles start forward as a traffic light changes will

be impressed by how each additional driver starts a little later than his predecessor… This same slack is encountered in large organizations, so when frequent changes are called for, a large organization is very inept. The industries making style goods (women's apparel and shoes, novelty toys, and so forth) are consistently dominated my smaller and more flexible companies. Again, those enterprises requiring very close coordination of skills of men are seldom large scale." (Stigler 1968)

Large firms with market power are said to have high learning curves and benefit from learning by doing in that their unit costs are consistently falling with output. By producing an identical product in large volumes and running repetitive production processes monopoly and oligopoly experience falling cost curves and, thus, achieve efficiency. As opposed to the manager of a large corporation, a sole proprietor gains learning experience in adapting to change and has a high learning curve in rapidly changing styles, colors, shapes and models. Adapting to change and providing variety becomes the specialty of the sole proprietor whose diverse product becomes socially more important than a tedious, standardized one.

4. Transaction costs considered

Imperfect competition may arise from a limited number of competitors, price leadership, product differentiation, lack of direct substitutes, specific trade and marketing practices, exclusive dealership, specialized distribution, specialized advertising, etc. These features are common for both the "small-group" case and the "large-group" case of imperfectly competitive markets. But in addition to these characteristics monopolistic competition carries the features of perfect competition in that there are numerous buyers and sellers; entry is free and happens on a small scale, while exit is easy since all costs are recoverable. Perfect competition is always given as the ideal allocation of economic resources since it provides for full use of capacity at the social optimum and the lowest point of what is called full production costs.

Perfect competition is, therefore, given as a benchmark by which the efficiency of other market structures is judged. Yet, perfect competition is more of a theoretical construct and impossibility in real terms. Products in effect can hardly be perfectly homogeneous and the market power of the individual firm cannot be zero. Clark (1939) discusses this lack of realism in the following terms:

"Perfect competition is an impossible abstraction, and imperfect competition is inevitable, on account of the unavoidable characteristics of industrial production, regardless of the forms of trade practice within which actual competition is canalized."

Tothe standard arguments given by neoclassical economics one can add the costs of using the market mechanism which can be significant with some types of market structures. Neoclassical analysis assumes that exchange occurs at zero transaction costs. Participants in perfectly competitive markets are presumed to conduct transactions at zero cost and be perfectly informed. Information costs as a type of transaction costs areignored and market participants are said to appropriate information about prices, quality levels and product features freely and at no cost. Since information is perfect both sides are fully and symmetrically informed. With zero transaction costs market exchange occurs at no cost and exactly at the competitive point. In real life transaction costs are positive, though. This limits the use of perfect competition as a theoretical foundation. Capacity and minimum efficient scale which originate from the theory of perfect competition and which welfare economics uses in its set of tools to compare the ideal outcome with suboptimal allocations, are thus purely theoretical concepts, rather than practical prescriptions. Under the assumption of positive transaction costs perfect competition and excess capacity lose their normative meaning and cannot prescribe how much to produce, what to produce or how to produce. Transaction costs render perfect competition an artificial construct.

Lower levels of transaction costs in some industries pair with smaller firms, while in otherhigher transaction costs relate to larger firms which supersede the market mechanism. Coase (1937) discusses that when the costs of transacting are sizable the manager undertakes to carry out the tasks of the market to economize on these costs and achieve efficiency within the firm. Thus firm size increases and the manager takes on more and more of the functions of the market as the costs of using the market increase and as it pays him to perform the duties of the market.In the extreme case, Coase hypothesizes, there will be only one firm engulfing all functions of the market and substituting it completely. Real market allocation does not occur at zero transaction costs but positive, and in some cases, significant transaction costs which provide for monopoly to overcome those.Since transaction costs could be viewed as a fixed cost component added to the full production costs of the firm, they increase its optimal scale of operations. Adding a fixed-cost component to firm structure always expands the minimum efficient scale of operations as demonstrated by Figure 13, the distance between cost level LRAC and

LRAC′ being the level of transaction costs on the particular market. In line with Coasean thinking a firm with market power arises out of sizable industry transaction costs.

In monopolistically competitive markets information can be obtained at low cost and transactions take less to organize, relative to market structures with market power. In Figure 13 the full production and transaction costs of the competitive firm lie at or slightly above the LRAC curve. In monopolistically competitive industries where information is easy to obtain and the potential for opportunism is negligible, the costs of using the market mechanism are infinitesimal. Monopolistically competitive markets are characterized by strong competition, easy entry and exit, little opportunism, accessible and abundant information and nearly complete certainty. Under positive transaction costs, monopolistic, not perfect, competition is the true form of competition.

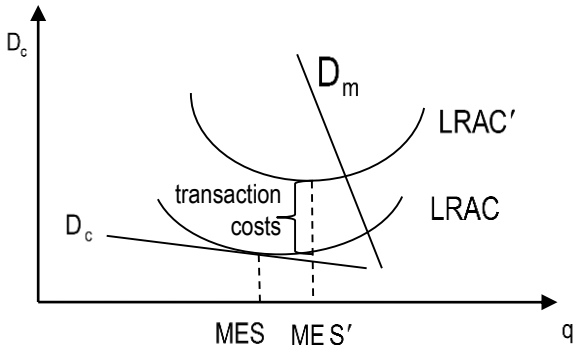


Figure 13 - Optimal firm size under positive transaction costs

In contrast, private monopoly is an extreme form of market power where competition is absent, there is great potential for uncertainty and contractual opportunism on the part of the monopolist, information is costly to obtainand there are natural or artificial barriers to entry. As a form of market failure, monopoly power originates in transaction costs, with transaction costs being low in monopolistically competitive markets and high in monopoly and oligopoly. Monopolistic competition, therefore, is a situation which provides for optimal allocation of economic resources, since it reflects the social optimum at positive, yet minimal, transaction costs.

Advertising contributes essentially to information costs. Church and Ware (2000) stress that “if the world were like the description of perfect competition … where all consumers were perfectly informed, and all markets operated frictionless, then there would be no need for any advertising, whether it was informative or not.” Advertising is most intensive where greater informational asymmetries, opportunism on quality, cheating and other transaction costs exist and where the need for advertising is stronger. This happens more frequently with oligopoly and less so with monopolistic competition.

The concept of excess capacity in monopolistic competition thus is a misperception and should be abandoned altogether in economic theory and microeconomic classes. Excess capacity should not be considered an inefficiency of the monopolistically competitive firm in a long-run equilibrium, since this type of a firm offers optimal allocation of resources in the presence of positive transaction costs. Given that perfect competition is an unrealistic outcome, it is better to talk of perfect monopolistic competition or just competition. The monopolistically competitive firm is faced with a relatively flat and low demand curve, on the one hand, and an envelope cost curve which is not excessively extended.

Furthermore, the competitive firm provides greatest variety at lowest cost. It is possible that at the time Chamberlin and Robinson developed their theory of imperfect competition, demand curves were steeper due to greater product differentiation, entry was easy to prevent and monopolistically competitive firms resembled oligopoly. Perhaps in those days it was more difficult to distinguish between the “small-group” case and the “large-group” case. But today heavy advertising, large-scale research, patents, licenses, and other barriers to entry create a clear boundary between oligopolies and monopolistic competition. Contemporary production techniques allow small firms to set up flexible productions and offer variety at low cost. Due to innovation average cost curves are now lower than they have been several decades ago. Entry is easier since no significant setup costs or initial investments are necessary. Contemporary sophisticated consumers today might view monopolistically competitive products as less differentiated, if not perfect, substitutes. The cost of variety might have been reduced significantly by the means of contemporary technology also.

Conclusion

Classical economists wrongly merged the idea of competition with monopoly – they assumed a very steep demand curve with low demand for the monopolistically competitive firm. Under free entry a firm cannot have market power and charge little at the same time. Classical economists were also inconsiderate of transaction costs which render perfect competition an artificial setup. Using the standard tools of neoclassical analysis, we have demonstrated that there is little potential for excess capacity to exist in monopolistically competitive firms. This becomes evident from the analysis of both demand and cost curves. Accounting for positive information costs, as well as other transaction costs, we find that monopolistic competition is the true type of competition, compared to the unrealistic perfectly competitive setup, and, therefore, an optimal form of resource allocation.

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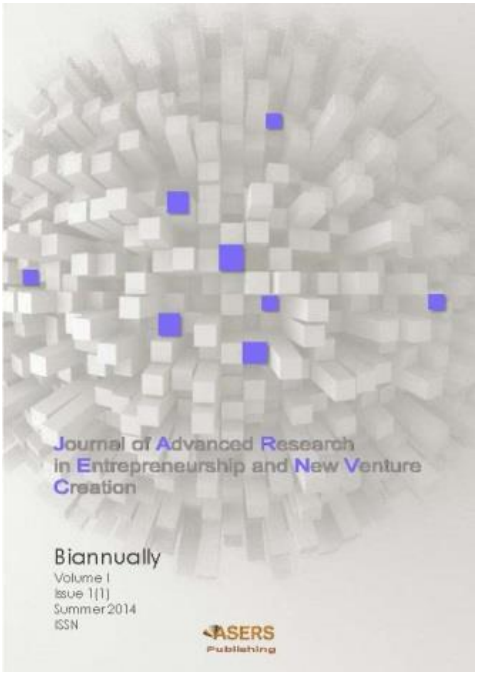

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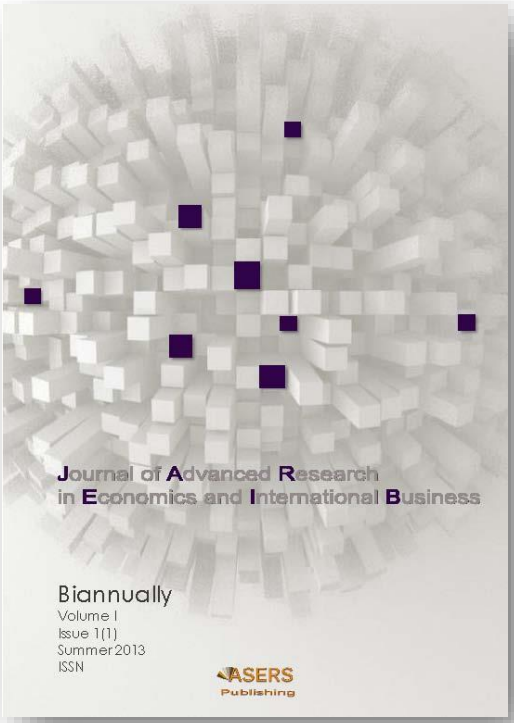

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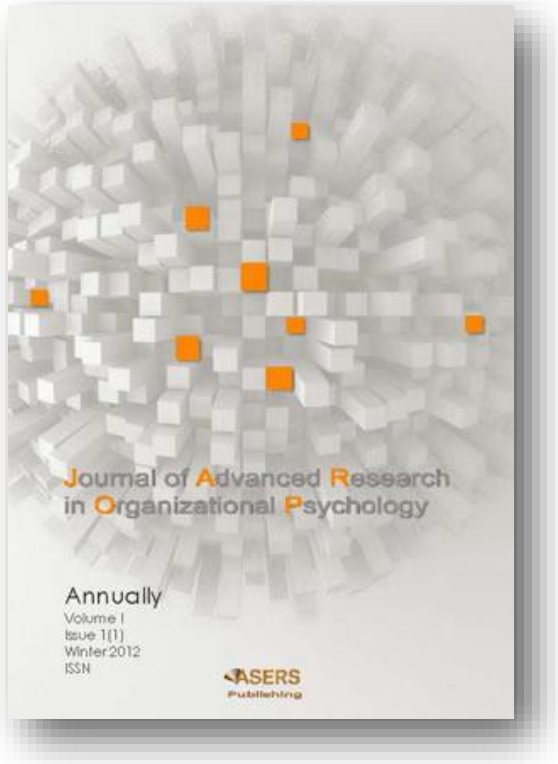

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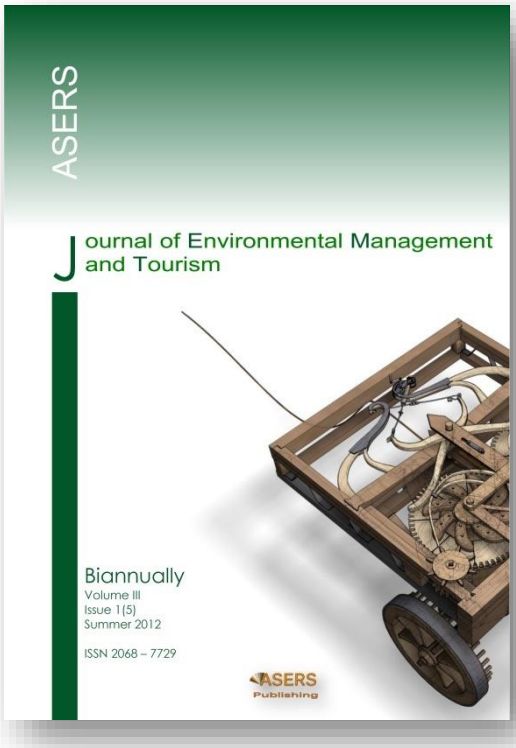

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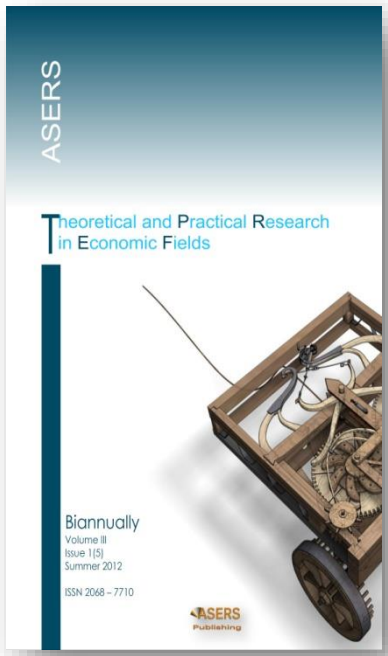

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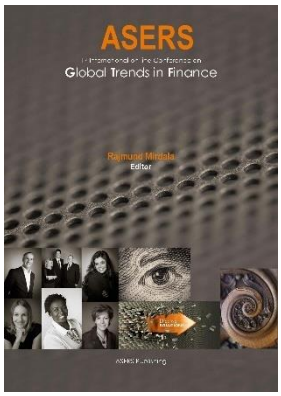

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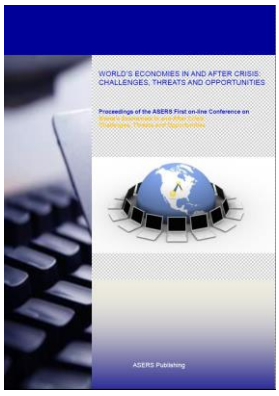

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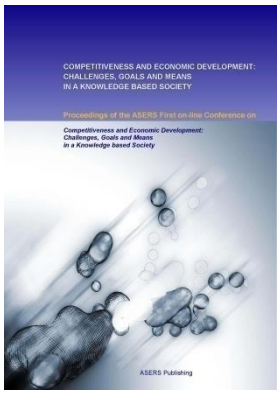

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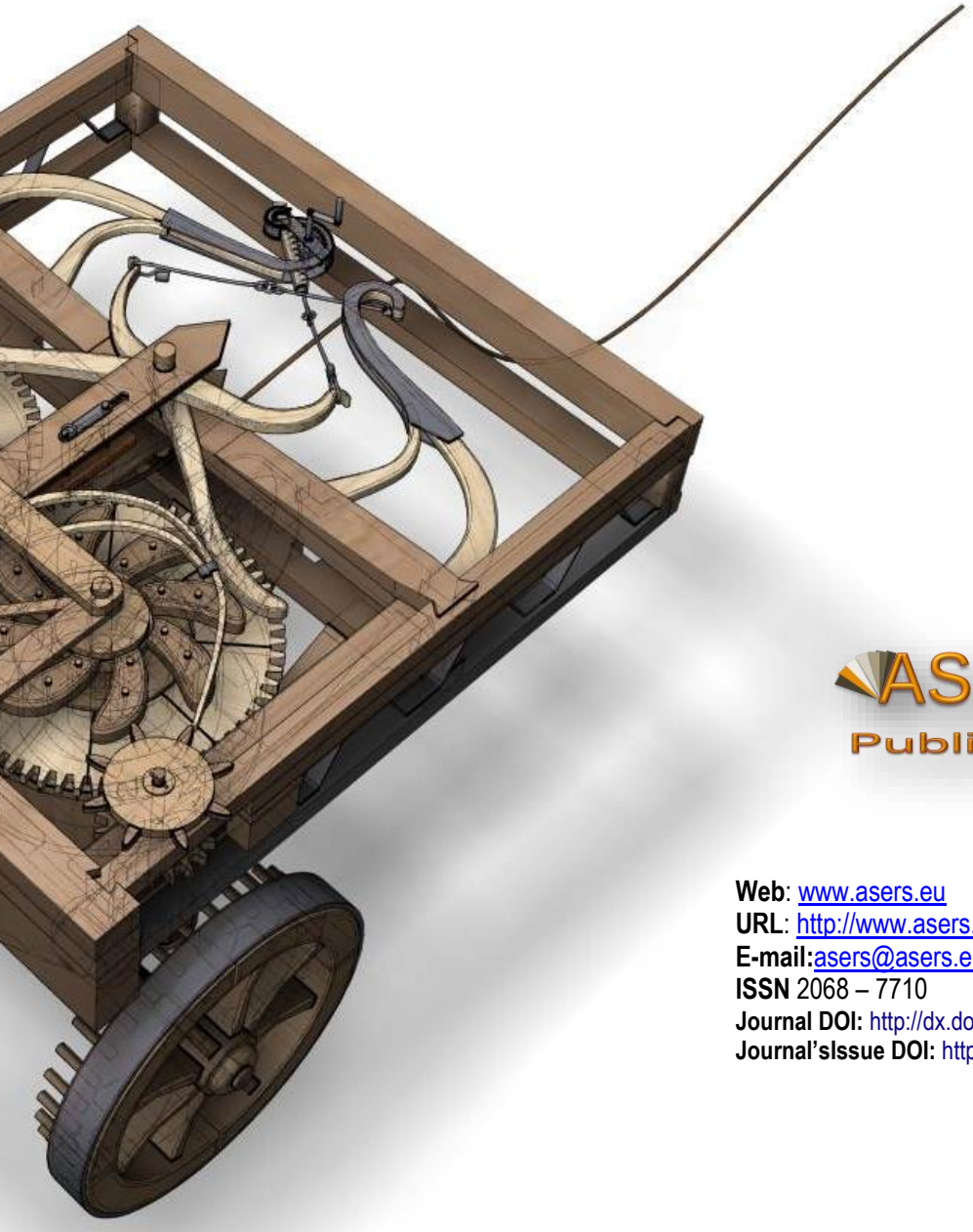

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