International Journal of Economics, Management and Tourism

GOCE DELCEV UNIVERSITY OF STIP
FACULTY OF TOURISM AND BUSINESS LOGISTICS

INTERNATIONAL JOURNAL OF ECONOMICS, MANAGEMENT AND TOURISM

VOL. 2 NO. 2

2022

ISSN 2671-3810 online version

Publisher:
Faculty of Tourism and Business Logistics
Goce Delchev University of Shtip
“Krste Misirkov” no.10-A P.O. Box 201 Shtip 2000, North Macedonia
Tel: +389 32 550 350
www.ftbl.ugd.edu.mk
www.ugd.edu.mk

The International Journal of Economics, Management and Tourism (IJEMT) is peer-reviewed and issued two times per year, in online version at the following website of the web portal of Goce Delcev University in Stip: https://js.ugd.edu.mk/index.php/ijemt/index. The official language for papers is English language.

IJEMT DOI: https://doi.org/10.46763/IJEMT

IJEMT Vol.2 No.2 DOI: https://doi.org/10.46763/IJEMT

TABLE OF CONTENTS

Manuscript received: 21.11.2022
Accepted: 06.12.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 7-25
Online: ISSN **2671-3810**
UDC: 339.13.053-057.182:330.88
Original scientific paper
https://doi.org/10.46763/IJEMT2222007j

HETEROGENOUS AGENTS AND INCOMPLETE MARKETS: AN EXPLORATION

Dushko Josheski [1*], Natasha Miteva[2], Tatjana Boshkov[3]
[1] *Associate professor Goce Delcev University of Stip, Faculty of tourism and business logistics, R.North Macedonia, dusko.josevski@ugd.edu.mk*
[2] *Assistant professor, Goce Delcev University of Stip, Faculty of tourism and business logistics, R.North Macedonia, natasa.miteva@ugd.edu.mk*
[3] *Associate professor, Goce Delcev University of Stip, Faculty of tourism and business logistics, R.North Macedonia, tatjana.dzaleva@ugd.edu.mk*
* *Corresponding author: dusko.josevski@ugd.edu.mk*

Abstract
This paper will review the issue of heterogeneity of agents and incomplete markets in macroeconomics. Central idea of this paper is the notion that representative agent models were wrong turn for modern macroeconomics especially for general equilibrium model (some individuals are some are not liquidity constrained) and that central problems of macroeconomics cannot arise in representative agent models (debt, bankruptcy, asymmetric information) as has also being criticized by Stiglitz (2017).And finally main motivation for this paper were Achdou et al.(2022) who developed algorithm for "solving equilibria in Aiyagari–Bewley–Huggett economy" and Krusell-Smith (1998) comparison of economy behavior when incomplete markets (heterogeneous agents) and complete markets (representative agent) economy.

Key words: *Heterogenous agents, incomplete markets, Huggett economy, Krusell-Smith economy, Aiyagari model*
JEL Classification: D14, D31, E21

INTRODUCTION

Heterogeneity of agents is relevant, and it could provide answers for the welfare questions that are crucial in macroeconomics. In a way it is a critique on representative agents' models. Lucas (1987) showed that for standard preferences, aggregate fluctuations have a very small impact on the welfare of a representative consumer. There are many heterogenous agents (HA) models, however in this paper we will stick to Huggett model (Huggett (1993)), and Krusell-Smith model (Krusell,Smith (1998)).Huggett model was based on the enormous literature that up until then was done on "….heterogenous-agent-incomplete-insurance models of asset pricing….", some of the references here include : Bewley (1980), Lucas (1980), Taub (1988). Models with heterogeneous agents have become a workhorse in macroeconomics since the seminal work of Bewley (1986), Hopenhayn (1992), Huggett (1993) and Aiyagari (1994). More complete review of this literature could be read in Heathcote et al.(2009).And why heterogeneity of agents is of interest in macroeconomics? This same question is asked and answered partially by Boppart et al. (2018).Marginal decisions made by households, regarding: consumption, hours worked, and investments in various types of assets "vary quite substantially" in population. As an example, study of previous Boppart et al. (2018) mentions: Johnson, Parker, Souleles (2004), who provide evidence on departure from permanent income hypothesis when agents are heterogenous, and Misra and Surico (2014) "for estimating the heterogeneity in responses across households". Real world problems such as inequality see Piketty (2014), and theoretical problems such as optimal taxation with heterogenous agents see Chien,Wen (2020),Ragot,Grand(2017), Bassetto et al.(1999),Brito etal.(1995),Stiglitz(1982),Arnott,Stiglitz(1988),Akerlof(1978),Diamond,Mirrlees(1978),Weiss (1976). Storesletten et al. (2001) showed that liquidity-constrained households are hit particularly hard by aggregate productivity shocks. Arrow (1951) and Arrow,Debreu

Manuscript received: 21.11.2022
Accepted: 06.12.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 7-25
Online: ISSN **2671-3810**
UDC: 339.13.053-057.182:330.88
Original scientific paper
https://doi.org/10.46763/IJEMT2222007j

(1954),proved that competitive equilibrium in Arrow-Debreu economy is Pareto optimal and discovered class of convex Arrow-Debreu economies for which competitive equilibria always exist. In the case of incomplete (see Geanakoplos (1990)) markets this equilibrium may (will) not be efficient see Geanakoplos (1986) or the will be suboptimal constrained. This paper will review previously mentioned issues will be doing so by using derivations and some examples from modern macroeconomic literature such as Achdou et al.(2022), which is the main paper that motivated as to review this area of macroeconomics.

MATERIAL AND METHODS

Hamilton-Jacobi Equation (HJB), Fokker-Planck equation (F-P) and Huggett economy

A crucial question here is how to model income. First, income can be modeled as a Poisson process, that allows income to take two values. Second, income can be modeled as a diffusion process, allowing that the income to take many values. In particular, the case in which the income process follows a two-stage Poisson process: $y_t \in \{y_1, y_2\}$ with $y_1 < y_2$. Here the income jumps from state 1 to state 2 with intensity λ_1 and vice versa with intensity λ_2 .Now, how does consumers in this model chooses optimal consumption? They maximize the lifetime present value utility function subject to the dynamic of individual wealth, the borrowing constraint, and the income process. When the agent solves his optimization problem, he takes as given the evolution of the equilibrium of the interest rate. The underlying assumption is that the agent is a price-taker. The next step is to set up and solve the equilibrium of this economy. The equilibrium is represented by a system of partial differential equations (PDEs). To solve this PDEs system, we need first to solve the Hamilton-Jacobi-Bellman equation (HJB) given an interest rate, and then to solve the Fokker-Planck equation (KFPE), and hence the equilibrium in the bond market. Now, we can update the value of the interest rate and start the loop again until we find the equilibrium interest rate. From these equations, we can find the consumption and savings policy functions and the stationary distribution of wealth. HJB equation was a result of the theory of dynamic programing pioneered by Richard Bellman (namely Bellman(1954),Bellman(1957),Bellman, Dreyfus,(1959)).HJB equation is modeled as in Achdou et al.(2022). The deterministic optimal control problem is given as:

equation 1

$$V(x_0) = \max_{u(t)_{t=0}^{\infty}} \int_0^{\infty} e^{-\rho t} h(x(t), u(t)dt \text{ s.t. } \dot{x}(t) = g\big(x(t)\big), u(t), u(t) \in U\,; t \geq 0, x(0) = x_0$$

In previous expression:$\rho \geq 0$ is the discount rate, $x \in X \subseteq \mathbb{R}^m$ is a state vector; $u \in U \subseteq \mathbb{R}^n$ is a control vector, and $h: X \times U \to R$. The value function of the generic optimal control problem satisfies the Hamilton-Jacobi-Bellman equation, i.e.:

equation 2

$$\rho V(x) = \max_{u \in U} h(x,u) + V'(x) \cdot g(x,u)$$

In the case with more than one state variable $m > 1, V'(x) \in \mathbb{R}^m$ is the gradient of the value function. Now for the derivation of the discrete-time Bellman eq. we have: time periods of length Δ ,discount factor $\beta(\Delta) = e^{-\rho\Delta}$, here we can note that $\lim_{\Delta \to \infty} \beta(\Delta) = 0$ and $\lim_{\Delta \to 0} \beta(\Delta) = 1$.Now that discrete Bellman equation is given as:

equation 3

$$V(k_t) = \max_{c_t} \Delta U(c_t) + e^{-\rho\Delta} V(k_{t+\Delta}) \text{ s.t. } k_{t+\Delta} = \Delta[F(k_t) - \delta k_t - c_t] + k_t$$

For a small $\Delta = 0$ we can make: $e^{-\rho\Delta} = 1 - \rho\Delta$, so that $V(k_t) = \max_{c_t} \Delta U(c_t) + (1 - \rho\Delta,)V(k_{t+\Delta})$,if we subtract $(1 - \rho\Delta,)V(k_t)$ from both sides and divide by Δ and manipulate the last term we get : $\rho V(k_t) = \max_{c_t} \Delta U(c_t) + (1 - \rho\Delta,)[V(k_{t+\Delta}) - V(k_t)\,]$ we get :

Manuscript received: 21.11.2022
Accepted: 06.12.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 7-25
Online: ISSN **2671-3810**
UDC: 339.13.053-057.182:330.88
Original scientific paper
https://doi.org/10.46763/IJEMT2222007j

equation 4

$$\rho V(k_t) = \max_{c_t} \Delta U(c_t) + (1 - \rho\Delta,) \frac{[V(k_{t+\Delta}) - V(k_t)]}{k_{t+\Delta} + k_t} \frac{k_{t+\Delta} - k_t}{\Delta}$$

If $\Delta \to 0$ then $\rho V(k_t) = \max_{c_t} \Delta U(c_t) + V'(k_t)\ \dot{k}_t$. Hamilton-Jacobi-Bellman equation in stochastic settings is given as:

equation 5

$$V(x_0)) = \max_{u(t)_{t=0}^{\infty}} \mathbb{E}_0 \int_0^{\infty} e^{-\rho t} h\big(x(t), u(t)\big) dt \text{ s.t.} dx(t) = g\big(x(t), u(t)\big) dt + \sigma\big(x(t)\big) dW(t)\,, u(t) \in U\,; t \geq 0, x(0) = x_0$$

In previous expression $x \in \mathbb{R}^m; u \in \mathbb{R}^n$. HJB equation without derivation is :

equation 6

$$\rho V(x) = \max_{u \in U} h(x,u) + V'(x) g(x,u) + \frac{1}{2} V''(x) \sigma^2(x)$$

In the multivariate case: for fixed x we define $m \times m$ covariance matrix, $\sigma^2(x) = \sigma(x)\sigma(x)'$ which is a function of $\sigma^2 \colon \mathbb{R}^m \to \mathbb{R}^m \times \mathbb{R}^m$. HJB equation now is given as:

equation 7

$$\rho V(x) = \max_{u \in U} h(x,u) + \sum_{i=1}^{m} \frac{\partial V(x)}{\partial x_i} g_i(x,u) + \frac{1}{2} \sum_{i=1}^{m} \sum_{j=1}^{m} \frac{\partial^2 V(x)}{\partial x_i \partial x_j} \sigma_{ij}^2(x)$$

In vector notation previous is given as:

equation 8

$$\rho V(x) = \max_{u \in U} h(x,u) + \nabla_x V(x) \cdot g(x,u) + \frac{1}{2} tr\big(\Delta_x V(x) \sigma^2(x)\big)$$

Where $\nabla_x V(x)$: gradient of V (dimension $m \times 1$) ; $\Delta_x V(x)$: Hessian matrix of V (dimension $m \times m$).By Ito's lemma[1]:

equation 9

$$df(x) = \left(\sum_{i=1}^{n} \mu_i(x) \frac{\partial f(x)}{\partial x_i} + \frac{1}{2} \sum_{i=1}^{m} \sum_{i=1}^{m} \sigma_{ij}^2(x) \frac{\partial^2 f(x)}{\partial x_i \partial x_j} \right) dt + \sum_{i=1}^{m} \sigma_I(x) \frac{\partial f(x)}{\partial x_i} dW_i$$

In vector notation:

equation 10

$$df(x) = \left(\nabla_x f(x) \cdot \mu(x) + \frac{1}{2} tr\big(\Delta_x f(x) \sigma^2(x)\big) \right) dt + \nabla_x f(x) \cdot \sigma(x) dW$$

Now for the Kolmogorov Forward (Fokker-Planck[2]) equation we have folowing: let x be a scalar diffusion

equation 11

$$dx = \mu(x)dt + \sigma(x)dW, x(0) = x_0$$

[1] Itô's lemma is an identity used in Itô calculus to find the differential of a time-dependent function of a stochastic process. It serves as the stochastic calculus counterpart of the chain rule, see Kiyosi Itô (1951).

[2] See Fokker (1914), Planck (1917), Kolmogorov (1931).

Manuscript received: 21.11.2022
Accepted: 06.12.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 7-25
Online: ISSN **2671-3810**
UDC: 339.13.053-057.182:330.88
Original scientific paper
https://doi.org/10.46763/IJEMT2222007j

Let's suppose that we are interested in the evolution of the distribution of $x, f(x,t)$ and $\lim_{t\to\infty} f(x,t)$ .So, given an initial distribution $f(x,0) = f_0(x), f(x,t)$ satisfies PDE :

equation 12

$$\frac{\partial f(x,t)}{\partial t} = -\frac{\partial}{\partial x}[\mu(x)f(x,t)] + \frac{1}{2}\frac{\partial^2}{\partial x^2}[\sigma^2(x)f(x,t)]$$

Previous PDE is called "Kolmogorov Forward Equation" or "Fokker-Planck Equation".

Corollary 1: if a stationary equilibrium exists $\lim_{t\to\infty} f(x,t) = f(x)$, it satisfies ODE

equation 13

$$0 - \frac{d}{dx}[\mu(x)f(x)] + \frac{1}{2}\frac{d^2}{dx^2}[\sigma^2(x)f(x)]$$

In the multivariate case Kolmogorov Forward Equation is given as:

equation 14

$$\frac{\partial f(x,t)}{\partial t} = -\sum_{i=1}^{m}\frac{\partial}{\partial x_i}[\mu(x)f(x,t)] + \frac{1}{2}\sum_{i=1}^{m}\sum_{j=1}^{m}\frac{\partial^2}{\partial x^2}\left[\sigma_{ij}^2(x)f(x,t)\right]$$

Finite difference method and HJB equation

As in Achdou et al.(2022), two functions v_1, v_2 at I discrete points in the space dimension a_i , $i = 1, \dots, I$. Equispaced grids are denoted by Δa_ias the distance by the grid points, and shot hand notation used is $v_{i,j} \equiv v_j(a_i)$ and so on. Backward difference approximation is given as:

equation 15

$$\begin{cases} v_j'(a_i) \approx \dfrac{v_{i+1,j} - v_{i,j}}{\Delta a} \equiv v'_{i,j,F} \\ v_j'(a_i) \approx \dfrac{v_{i+1,j} - v_{i-1,j}}{\Delta a} \equiv v'_{i,j,B} \end{cases}$$

Two basic equations to explain Huggett economy are :

equation 16

$$\begin{cases} \rho v_1(a) = \max_c u(c) + v_1'(a)(z_1 + ra - c) + \lambda_1\big(v_2(a) - v_1(a)\big) \\ \rho v_2(a) = \max_c u(c) + v_2'(a)(z_2 + ra - c) + \lambda_2\big(v_1(a) - v_2(a)\big) \end{cases}$$

Where $\rho \geq 0$ represents the discount factor for the future consumption c_t (Individuals have standard preferences over utility flows), a represents wealth in form of bonds that evolve according to :

equation 17

$$\dot{a} = y_t + r_t a_t - c_t$$

y_t is the income of individual, which is endowment of economy's final good, and r_t represents the interest rate. Equilibrium in this Huggett (1993) economy is given as:

equation 18

$$\int_{\underline{a}}^{\infty} a g_1(a,t)da + \int_{\underline{a}}^{\infty} a g_2(a,t)da = B$$

Where in previous expression $0 \leq B \leq \infty$ and when $B = 0$ that means that bonds are zero net supply. So the finite difference method approx. to $\begin{cases} \rho v_1(a) = \max_c u(c) + v_1'(a)(z_1 + ra - c) + \lambda_1\big(v_2(a) - v_1(a)\big) \\ \rho v_2(a) = \max_c u(c) + v_2'(a)(z_2 + ra - c) + \lambda_2\big(v_1(a) - v_2(a)\big) \end{cases}$ is given as:

Manuscript received: 21.11.2022
Accepted: 06.12.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 7-25
Online: ISSN **2671-3810**
UDC: 339.13.053-057.182:330.88
Original scientific paper
https://doi.org/10.46763/IJEMT2222007j

equation 19

$$\rho v_{i,j} = u(c_{i,j}) + v'_{i,j}(z_j + ra_i + c_{i,j}) + \lambda_j(v_{i,-j} - v_{i,j}), j = 1,2$$
$$c_{i,j} = (u')^{-1}(v'_{i,j})$$

Euler equation

Here following lemma applies see Achdou et al.(2022)

Lemma 1: The consumption and savings policy functions $c_j(a)$ and $s_j(a)$ for $j = 1,2..$ corresponding to HJB equation : $\rho v_j(a) = \max_c u(c) + v'_j(a)(y_j + ra - c) + \lambda_j\left(v_{-j}(a) - v_j(a)\right)$ which is maximized at : $0 = -\frac{d}{da}\left[s_j(a)g_j(a)\right] - \lambda_j g_j(a) + \lambda_{-j}g_{-j}(a)$ is given as:

equation 20

$$(\rho - r)u'\left(c_j(a)\right) = u''\left(c_J(a)\right)c'_j(a)s_j(a) + \lambda_j(u'\left(c_{-j}(a)\right) - u'\left(c_j(a)\right)$$
$$s_J(a) = y_J + ra - c_j(a)$$

Proof: differentiate $\rho v_j(a) = \max_c u(c) + v'_j(a)(y_j + ra - c) + \lambda_j\left(v_{-j}(a) - v_j(a)\right)$ with respect to a and use that $v'_j(a) = u'\left(c_j(a)\right)$ and hence $v''_j(a) = u''\left(c_j(a)\right)c'_j(a)$ ■

The differential equation $(\rho - r)u'\left(c_j(a)\right) = u''\left(c_J(a)\right)c'_j(a)s_j(a) + \lambda_j(u'\left(c_{-j}(a)\right) - u'\left(c_j(a)\right)$, $s_J(a) = y_J + ra - c_j(a)$ is and Euler equation , the right hand side $(\rho - r)u'\left(c_j(a)\right)$ is expected change of marginal utility of consumption $\frac{\mathbb{E}_t[du'(c_j(a_t)]}{dt}$.This uses Ito's formula to Poisson process:

equation 21

$$\mathbb{E}_t[du'(c_j(a_t)] = \left[u''(c_j(a_t)c'_j(a_t)s_j(a_t) + \lambda_j\left(u'(c_{-j}(a_t)\right) - u'\left(c_j(a_t)\right)\right]dt$$

So, this equation $(\rho - r)u'\left(c_j(a)\right) = u''\left(c_J(a)\right)c'_j(a)s_j(a) + \lambda_j(u'\left(c_{-j}(a)\right) - u'\left(c_j(a)\right)$, $s_J(a) = y_J + ra - c_j(a)$ can be written in more standard form:

equation 22

$$\frac{\mathbb{E}_t[du'(c_j(a_t)]}{dt} = (\rho - r)dt$$

CARA utility with borrowing constraint

Assumption 1: The CARA coefficient $\mathcal{R}(c) := -\frac{u''(c)}{u'(c)}$ when wealth $a \to \underline{a}$ approaches lower borrowing limit is given as see Achdou et al.(2022):

equation 23

$$\underline{\mathcal{R}} := = \lim_{a \to \underline{a}} \frac{u''(y_1 + ra)}{u'(y_1 + ra)} < \infty$$

This is also known as the Arrow–Pratt measure of absolute risk aversion (ARA), after the economists Arrow (1965), and Pratt (1964).

Marginal propensity to consume (MPC) and Marginal propensity to save (MPS)

Manuscript received: 21.11.2022
Accepted: 06.12.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 7-25
Online: ISSN **2671-3810**
UDC: 339.13.053-057.182:330.88
Original scientific paper
https://doi.org/10.46763/IJEMT2222007j

Definition 1: Marginal propensity to consume (MPC) is defined as:

equation 24

$$MPC_{j.\tau}(a) = c'_{j,\tau}(a) = \mathbb{E}\left[\int_0^{\tau} c_j(a_t)dt \,\middle|\, a_0 = a, y_0 = y_j\right)\Bigg]$$

Similarly, MPS is given as $MPS_{j.\tau}(a) = s'_{j,\tau}(a) = \mathbb{E}\big[a_\tau \big| a_0 = a, y_0 = y_j\big)\big]$

Assumption 2: if we define Euler equation and budget constraint as:
equation 25

$$\frac{\dot{c}}{c} = \frac{1}{\gamma}(r-\rho); \dot{a} = ra - c$$

We must remember that $u(c) = \frac{c^{1-\gamma}}{1-\gamma}; \gamma > 0$; so now savings and consumption are:

equation 26

$$\dot{a}(t) = -\eta a(t);$$
$$\eta := \frac{\rho - r}{\gamma}$$
$$c(t) = (r+\eta)a(t)$$

So the wealth is given as:
equation 27

$$a(\tau) = a_0 e^{-\eta t}, \tau \geq 0$$

CARA utility with upper borrowing constraint

Assumption 3. Here we are assuming that: $\rho < r$; $y_1 < y_2$ and that CRRA is given as:
equation 28

$$\mathcal{R}(c) = -\frac{cu''(c)}{u'(c)}$$

$\exists \overline{a} < \infty$ such that $s_j(a) < 0$; $\forall a \geq \overline{a}; j = 1,2..$and $s_2(a) \sim \psi_2(\overline{a} - a)$ as $a \to \overline{a}$ for some constant ψ. Asymptotic movement of wealth of some individual is given as :
equation 29

$$\dot{a}(\tau) = a(\tau) - \overline{a} \sim e^{-\psi_2 \tau}(a_0 - \overline{a})$$

In case $u(c) = \frac{c^{1-\gamma}}{1-\gamma}$ individual policy functions are linear in a. In the asymptotic case where $a \to \infty$ satisfy: $s_j(a) \sim \frac{r-\rho}{\gamma}a$, so $c_j(a) \sim \frac{\rho-(1-\gamma)r}{\gamma}a$.

First part of this proposition where $-\frac{cu''(c)}{u'(c)}$ is bounded above $\forall c$ rules out exponential utility function, $u(c) = -\frac{1}{\theta}e^{-\theta c}; \theta > 0$. This is like Aiyagari (1994). While the second part $s_j(a) \sim \frac{r-\rho}{\gamma}a$, $c_j(a) \sim \frac{\rho-(1-\gamma)r}{\gamma}a$ is same as in Benhabib,Bisin, Zhu (2015),see Achdou et al.(2022).
Now, since $\underline{a} = -\frac{y}{r}$,consumption and saving policy functions are given as:
equation 30

$$s(a) = \frac{r-\rho}{\gamma}\left(a + \frac{y}{r}\right);$$
$$c(a) = \frac{\rho-(1-\gamma)r}{\gamma}\left(a + \frac{y}{r}\right)$$

Manuscript received: 21.11.2022
Accepted: 06.12.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 7-25
Online: ISSN **2671-3810**
UDC: 339.13.053-057.182:330.88
Original scientific paper
https://doi.org/10.46763/IJEMT2222007j

Krussel, Smith (1998) explain that linearity of consumption and saving policy functions with CRRA utility functions, explains their finding that the business cycle properties of baseline heterogeneous agent model are virtually indistinguishable from its representative agent counterpart. Now MPC and MPS will be given as: $MPS_\tau(a) = e^{-\eta\tau} \approx 1 - \eta\tau$ and $MPC_\tau(a) = 1 - e^{-\eta\tau} + \tau r \approx \tau(\eta + r), \eta := \frac{\rho - r}{\gamma}$.

Lemma 2. The conditional expectation of consumption $c_{j,\tau}(a)$ defined previously as $c'_{j,\tau}(a) = \mathbb{E}\left[\int_0^\tau c_j(a_t)dt \,\middle|\, a_0 = a, y_0 = y_j\right]$ can be computed as $c_{j.\tau}(a) = \mathcal{P}_j(a, 0)$.In previous expression $\mathcal{P}_j$ satisfies system of two PDE's.

equation 31

$$0 = c_j(a) + \partial_a \mathcal{P}_j(a,\tau)s_j(a) + \lambda_j\left(\mathcal{P}_{-j}(a,\tau) - \mathcal{P}_j(a,\tau)\right) + \partial_\tau \mathcal{P}_j(a,\tau), j = 1,2..\mathcal{P}_j(a,\tau) = \forall a$$

Proof per Achdou et al.(2022) follows directly from application of Feynman-Kac formula for computing conditional expectations as solutions to PDE's. So, since $c'_{j,\tau}(a) = \mathbb{E}\left[\int_0^\tau c_j(a_t)dt \,\middle|\, a_0 = a, y_0 = y_j\right]$ and if A is infinitesimal generator (Feller process or Levy process, or Ornstein–Uhlenbeck process):

1. **Feller process**-Let E be a LCCB (locally compact with countable base) and $E \subset \mathbb{R}^n, \exists n \in N$ and $C_0(E) = C_0(E, \mathbb{R})$ be the space of continuous function that vanishes in inf. A Feller semigroup $C_0(E)$ is a family of positive linear operators $T_\tau, \tau \geq 0$ on $C_0(E)$
   - ✓ $T_0 = Id; \|T_\tau\|; \forall\tau \in T$ i.e. $\{T_\tau\}_{\tau\in T}$ is a family of contracting maps
   - ✓ $T_{\tau+s} = T_\tau \circ T_s$ (the semigroup property)
   - ✓ $\lim_{t\downarrow 0}\|T_\tau f - f\| \forall f \in C_0(E)$

See Revuz et al.(2005).

2. **Levy process**- L let be is an infinite divisible random variable $\forall t \in [0, \infty]$
   - ✓ L can be written as the sum of a diffusion, a continuous Martingale and a pure jump process; i.e:

equation 32

$$L_t = at + \sigma B_t + \int_{|x|<1} x d\tilde{N}_\tau + \int_{|x|\geq 1} x dN_\tau(\cdot, dx), \forall t \geq 0$$

In previous expression $a \in \Re$, B_t is the standard Brownian motion, N is defined to be the Poisson random measure of the Lèvy process

- ✓ Lèvy -Khintchine formula: from the previous property it can be shown that for $\forall\tau \geq 0$ one has that :

equation 33

$$E\left|e^{inL_t}\right| = e\text{^}(-\tau\psi(u)$$

$$\psi(u) = -iau + \frac{\sigma^2}{2}u^2 + \int_{|x|\geq 1}\left(1 - e^{iux}\right)dv(x) + \int_{|x|<1}\left(1 + e^{iux} + iux\right)dv(x)$$

$a \in \Re; \sigma \in [0, \infty); v > 0$ borel measure and σ is Lèvy measure. More so $v(\cdot) = E[N_1(\cdot, A)]$
See Applebaum (2004).

3. **Ornstein–Uhlenbeck process-** The Ornstein-Uhlenbeck process is a stochastic process that satisfies the following stochastic differential equation:

equation 34

$$dx_\tau = k(\theta - x_\tau)d\tau + \sigma dW_\tau$$

$k > 0$ is the mean rate of reversion; θ is the long term mean of the process, $\sigma > 0$ is the volatility or average magnitude, per square-root time, of the random fluctuations that are modelled as Brownian motions.

- ✓ Mean reverting property-where $dx_\tau = k(\theta - x)$:

Manuscript received: 21.11.2022
Accepted: 06.12.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 7-25
Online: ISSN **2671-3810**
UDC: 339.13.053-057.182:330.88
Original scientific paper
https://doi.org/10.46763/IJEMT2222007j

equation 35

$$\frac{\theta - x_\tau}{\theta - x_0} = e^{-k(\tau-\tau_0)}, x_\tau = \theta + (x_0 - \theta)e^{-k(\tau-\tau_0)}$$

- ✓ Solution for $\forall \tau > s \geq 0$ is given as:

equation 36

$$x_\tau = \theta + (x_s - \theta)e^{-k(\tau-s)} + \sigma \int_s^\tau e^{-k(\tau-u)} dW_u$$

See Jacobsen.M(1996) .So now partial differential equation $\frac{\partial c_{j,\tau}}{\partial \tau} = Ac_{j,\tau}(a) - c_{j,\tau}(\underline{a})(a)$ is the solution to $c'_{j,\tau}(a) = \mathbb{E}\left[\int_0^\tau c_j(a_t)dt \,\middle|\, a_0 = a, y_0 = y_j\right]$ ■.

Short note on Feynman -Kac formula

Feynman-Kac formula- Suppose $\exists \mathcal{P}(t,x)$ that satisfies :$\frac{\partial \mathcal{P}}{\partial t} + f(t,x)\frac{\partial \mathcal{P}}{\partial x} + \frac{1}{2}\rho^2(t,x)\frac{\partial^2 \mathcal{P}}{\partial x^2} - R(x)\mathcal{P} + h(t,x) = 0$ s.t $\mathcal{P}(t,x) = \psi(x)$. Then $\exists \widetilde{W}(t)$ and a measure $\mathcal{Q}$ where solution is given as $\mathcal{P}(t,x) = E_{\mathcal{Q}}[\int_t^T \mathcal{V}(t,u)h\big(u,x(u)\big)du + \mathcal{V}(t,T)\psi\big(x(t)\big)|\mathcal{F}_t]; t < T$ $dx(t) = f\big(t,x(t)\big)dt + \rho\big(t,x(t)\big)d\widetilde{W}(t);$ $\mathcal{V}(t,u) = \exp\left(-\int_t^u R(x(s)ds\right)$ given that $\int_t^T E_{\mathcal{Q}}\left[\left(\rho\big(s,x(s)\big)\frac{\partial \mathcal{P}}{\partial x}\big(s,x(s)\big)\right]^2 \middle| \mathcal{F}_t\right]$ .In previous expression $\mathcal{F}_t$ is a σalgebra[3]

Note on "MIT"shocks

Following Boppart et al. (2018)," simple linearization method for analyzing frameworks with consumer heterogeneity and aggregate shocks" was applied to standard RBC model with neutral technology shocks as in Kydland,Prescott (1982),and investment specific as in investment-specific, as in Greenwood et al. (2000). In definition given by Boppart et al. (2018) "MIT shock" is defined as:
"*An "MIT shock" is an unexpected shock that hits an economy at its steady state, leading to a transition path back towards the economy's steady state……*".
Mukoyama (2021) also follows Boppart et al. (2018) definition:"…. the probability of the shock is considered zero, and no prior (contingent) arrangement is possible for the occurrence of the MIT shock".....The dynamic analysis that was using exogenous shocks or policy changes has been used in the literature with the earlier examples including: Abel,Blanchard (1983), Auerbach, Kotlikoff (1983), and Judd (1985).And more recent examples being: Boppart et al. (2018), Kaplan et al. (2018), Boar ,Midrigan (2020), Guerrieri et al. (2020).

Transitory dynamics and MIT shocks (an implicit-uncertainty economy): short note

In the Aiyagari version of the model[4]:

equation 37

$$r(t) = F_k(K(t),1)) - \delta$$
$$w(t) = F_l(K(t),1))$$
$$K(t) = \int ag_1(a,t)da + \int ag_2(a,t)da$$

HJB equation is given as:

[3] Let $\mathcal{P}(x)$is a $\mathcal{P}(s)$, then a subset $\sum \subseteq \mathcal{P}(x)$ is σ-algebra if it satisfies: $x \in \sum$, and is considered to be $\cup$, and if $x \in \sum \Rightarrow \overline{x} \in \sum$; and if $x_1, x_2, \ldots \in \sum$ then $x = x_1 \cup x_2$ ….see Rudin (1987).
[4] See lecture notes by Benjamin Moll: https://benjaminmoll.com/lectures/

Manuscript received: 21.11.2022
Accepted: 06.12.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 7-25
Online: ISSN **2671-3810**
UDC: 339.13.053-057.182:330.88
Original scientific paper
https://doi.org/10.46763/IJEMT2222007j

equation 38

$$\rho v_j(a,t) = \max_c u(c) + \partial_a v_j(a,t)\big(w(t)z_j + r(t)a - c\big) + \lambda_j\Big(v_{-j}(a,t) - v_j(a,t)\Big) + \partial_t v_j(a,t)$$

Kolmogorov Forward equation is:

equation 39

$$\partial_t q_j(a,t) = -\partial_a\big[s_j(a,t)g_j(a,t)\big] - \lambda_j g_j(a,t) + \lambda_{-j}(a,t) + \lambda_{-j}g_{-j}(a,t)$$
$$s_j(a,t) = w(t)z_j + r(t)a - c_j(a,t), c_j(a,t) = (u')^{-1}\Big(\partial_a v_j(a,t)\Big)$$

In previous expression a represents the borrowing limit, $g_{j,0}(a)$ represents the initial condition. Now, recall discretized equations for stationary equilibrium:

equation 40

$$\rho(v) = u(v) + A(v)v$$
$$0 = A(v)^{\mathrm{T}}g$$

Transition dynamics is given as:

- First denote $v_{i,j}^n = v_j(a_i t^n)$ and stack into v^n
- Denote $g_{i,j}^n = g_j(a_i, t^n)$ and stack into g^n

Then following applies:

equation 41

$$\rho v^n = u(v^{n+1}) + A\,(v^{n+1})v^n + \frac{1}{\Delta t}(v^{n+1} - v^n)$$
$$\frac{g^{n+1} - g^n}{\Delta t} = A(v)^{\mathrm{T}}g^{n+1}$$

Terminal condition for v is given as: $v^N = v_\infty$ which represents steady state, while initial condition is given as: $g: g^1 = g_0$.

Incomplete markets: Arrow securities and Bond markets (per Mukoyama (2021))

In this economy there are two types of consumers type I and type II. Arrow security[5] does not exist for the irregular state although the consumers recognize the possibility of the irregular state in the future. A Type-I consumer's problem is given as:

equation 42

$$\max_{c_1,c_2.\tilde{c}_2,a} u(c_1) + (1-\pi)u(c_2) + \pi u(\tilde{c}_2)$$

s.t. $c_1 + pa = 0; c_2 = 2 + a\ ; \tilde{c}_2 = 2 - \tau\ ;$

where a denotes holding Arrow securities, regular state occurs with probability $1-\pi$, irregular state occurs with probability π where $\pi \in (0,1)$. Type I receives $1-\tau$, Type II consumer receives $(1+\tau)$ where $\tau \in (0,1)$ in irregular state transfer occurs from Type I to type II consumer. Utility $u(\cdot)$ is strictly increasing, strictly concave, and continuously differentiable. Robbin, Joel W. (2010), here states that f is said to be continuous on $\mathbb{R}^l$ if :

equation 43

$$\forall x_0 \in \mathbb{R}^l \forall \epsilon > 0\ \exists \delta > 0\ \forall x \in \mathbb{R}^l[|x - x_0| < \delta\ | \Rightarrow f(x) - f(x_0) < \epsilon|]$$

In previous condition ϵ is trimmed price space [6], x_0 is vector parameter, hence why the PDF is of a form $f_{x_0}(x) = (x - x_0)$. Next, for type II consumer we have:

[5] An Arrow security is an instrument with a fixed payout of one unit in a specified state and no payout in other states, see Arrow (1953)

[6] Trimmed space as a location parameter class of probability functions that is parametrized by scalar or vector valued parameter x_0 which determines distributions or shift of the distribution.

Manuscript received: 21.11.2022
Accepted: 06.12.2022
International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 7-25
Online: ISSN **2671-3810**
UDC: 339.13.053-057.182:330.88
Original scientific paper
https://doi.org/10.46763/IJEMT2222007j

$$\max_{c'_1,c'_2.\tilde{c}'_2,a'} u(c'_1) + (1-\pi)u(c'_2) + \pi u(\tilde{c}'_2)$$

This is the maximization problem for consumer Type II $c'_1 + pa' = 2; c'_2 = a$; $\tilde{c}'_2 = \tau$.The competitive equilibrium here is :$(c_1, c'_1, c_2, c'_2, \tilde{c}_2, \tilde{c}'_2) = (1,1,1,2-\tau,\tau)$. Thus the limit is given as:

equation 44

$$li\,m_{\pi\to 0}(c_1, c'_1, c_2, c'_2, \tilde{c}_2, \tilde{c}'_2) = (1,1,2-\tau,\tau)$$

Where p is the price of Arrow security. In the Bond markets this version of the model is given as with quadratic utility function:

equation 45

$$u(c) = \alpha c - \frac{\gamma}{2}c^2$$

Where $\alpha > 0; \gamma > 0$, the value of $\alpha \gg 0$ so that utility is increasing in c for relevant range.Type I consumer problem in this economy is given as:

$$\max_{c_1,c_2.\tilde{c}_2,b} u(c_1) + (1-\pi)u(c_2) + \pi u(\tilde{c}_2)$$

s.t. $c_1 + qb = 1; c_2 = 1 + b$; $\tilde{c}_2 = 1 - \tau + b$; where q represents the bond price and b is the bond holding. Now, a type I consumer problem and bond demand after FOC is given as:

equation 46

$$b = \frac{q(\gamma-\alpha) + \alpha - \gamma(1-\pi\tau)}{\gamma(q^2+1)}$$

Type II consumer problem is given as :

$$\max_{c_1,c_2.\tilde{c}_2,b} u(c'_1) + (1-\pi)u(c'_2) + \pi u(\tilde{c}'_2)$$

s.t. $c'_1 + qb' = 1; c'_2 = 1 + b'$; $\tilde{c}'_2 = 1 - \tau + b'$ .The bond demand for Type II consumer is given as:

equation 47

$$b = \frac{q(\gamma-\alpha) + \alpha - \gamma(1+\pi\tau)}{\gamma(q^2+1)}$$

The bond price q demand is zero here is set so that :$b + b' = 0$. Now, $q = 1, (b, b') = \left(\frac{\pi}{2}\tau, -\frac{\pi}{2}\tau\right)$. The resulting consumption functions are :

equation 48

$$(c_1, c'_1, c_2, c'_2.\tilde{c}_2, \tilde{c}'_2) = \left(1 - \frac{\pi}{2}\tau, 1 + \frac{\pi}{2}\tau, 1 + \frac{\pi}{2}\tau, 1 - \frac{\pi}{2}\tau, 1 + \left(\frac{\pi}{2} - 1\right)\tau, 1 + \left(1 - \frac{\pi}{2}\right)\tau\right)$$

In the limit $\pi \to 0$, the consumption profile when irregular state takes place in period 2 approach:

equation 49

$$\lim_{\pi\to 0}(c_1, c'_1, \tilde{c}_2, \tilde{c}'_2) = (1,1,1-\tau,1+\tau)$$

Now in an Arrow security economy if there is MIT shock, because the irregular state is not spanned by the Arrow security, the ex-post allocation will be given as: $\tilde{c}'_2 = 2 - \tau$; $\tilde{c}'_2 = \tau$ where tilde $(\tilde{})$ denotes irregular state. The entire ex-post allocation with MIT shock is: $(c_1, c'_1, \tilde{c}_2, c'_2) = (1,1,2-\tau,\tau)$. The unique competitive equilibrium before the shock was: $p = 1, a = 1, a' = 1, c_1 = c'_1 = c_2 = c'_2 = 1$. In the bond economy post MIT shock allocation would be : $\tilde{c}_2 = 1 - \tau; \tilde{c}_2 = 1 + \tau$ .The unique competitive equilibrium before the shock was: $q = 1, b = -1, b' = 1$; $c_1 = c'_1 = c_2 = c'_2 = 1$.

Manuscript received: 21.11.2022
Accepted: 06.12.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 7-25
Online: ISSN **2671-3810**
UDC: 339.13.053-057.182:330.88
Original scientific paper
https://doi.org/10.46763/IJEMT2222007j

Krusell-Smith and Ayagari type incomplete markets

In this economy $i \in (0,1)$, $l(s_t) = s_t$ it is i.i.d employment with support $S = \{s_{\min}, s_{\max}\}$,where $s_{\min} > 0$. Now let $\pi'(s'|s) = \Pr(s_{t+1} = s'|s_t = s)$, and $\sum_{s'} \pi(s'|s) = 1, \forall s$ and $\pi(s') = \sum_s \pi(s'|s)\pi(s)$, we normalize $\mathbb{E}(s) = 1$.Preferences are given as:

equation 50

$$\mathbb{E}_0 \mathcal{U} = \mathbb{E}_0 \sum_{t=0}^{\infty} \beta^t U(c_t)$$

Budget and borrowing constraint are given as:

equation 51

$$c_t + a_{t+1} = w_t s_t + (1 + r_t)a_t - \tau_t$$

Where $a_t = k_t - b_t, c_t \geq 0, k_t \geq 0, b_t \leq \bar{b}_t, a_{t+1} \leq -\bar{b}_t$.The asset grid is $a_{t+1} \in A = \{a^1, a^2, .., a^N\}$. Now in previous $a^1 = -\bar{b}$

equation 52

$$\bar{b} = \inf_{\{s_{t+j}\}_{j=1}^{\infty}} \sum_{j=1}^{\infty} \left(\frac{q_{t+j}}{q_t}\right)\left[w_{t+j}s_{(t+j)} - \tau_{t+j}\right] = \sum_{j=0}^{\infty} \left(\frac{q_{t+j}}{q_t}\right)\left[w_{t+j}s_{min} - r_{t+j}D\right]$$

$$q_r \equiv \frac{q_{t-1}}{1 + r_t}$$

In equilibirum lets $\Phi_t(a, s) = \Pr(a_t = a, s_t = s)$ which will denote the joint probability of a, s in time period t.The distribution of wealth in period t is given by:

equation 53

$$\psi_t(a) = \sum_{x \in S} \Phi_t(a, s) = \Pr(a_t = a)$$

Market clearing condition is given as:$K_t + D = \sum_{a \in A} a\psi_t(a)$ .Where $D$is exogenous government debt, and K_t is aggregate *per capita* capital. Equilibrium prices are given as:

equation 54

$$r(t) = f'(K_t) - \delta \equiv r(K_t) = \hbar(r_t); w(t) = f(K_t) - f'(K_t)K_t \equiv w(K_t). w_t = \omega(r_t)$$

In recursive equilibrium suppose that, in equilibrium, the law of motion for the distribution of wealth is some functional Γ s.t.:$\Phi_{t+1} = \Gamma(\Phi_t)$,this means that the evolution of (Φ_t) is deterministic, also $K_t = K(\Phi_t)$; $\bar{b}_t = b(\Phi_t)$ .A recursive equilibrium is given by (V, A, Γ):

equation 55

$$V(a, s, \Phi) = \max U(c) + \beta \sum_{(s' \in S)} V(a', s', \Phi')\pi(s'|s)$$

s.t. $a' = w(\Phi')s' + [1 + r(\Phi')][a - c] - r(\Phi')D; 0 \leq c \leq a, a' \in A(\Phi); \Phi' = \Gamma(\Phi); A(a, s, \Phi) = argmax\{..\}$. Where Γ is generated by A that is , Γ maps $\Phi \to \Phi'$ so that :

equation 56

$$\Phi'(a', s') = \sum_{s \in S} \Phi(a, s) 1_{[A(a,s,\Phi)=a']} \pi(s, s')$$

Now capital plus debt equal to :

Manuscript received: 21.11.2022
Accepted: 06.12.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 7-25
Online: ISSN **2671-3810**
UDC: 339.13.053-057.182:330.88
Original scientific paper
https://doi.org/10.46763/IJEMT2222007j

equation 57

$$K_{t+1} + D = \sum_{a' \in A} a' \psi_{t+1}(a') = \sum_{a' \in A} \sum_{s' \in S} a' \Phi_{t+1}(a', s') = \sum_{a' \in A} \sum_{s' \in S} \sum_{s \in S, a \in A} \Phi(a, s) 1_{[A(a,s,\Phi)=a']} \pi(s, s') = \sum_{s \in S, a' \in A} \sum_{s' \in S} a' 1_{[A(a,s,\Phi_t)=a']} \Phi_t(a, s) \sum_{s' \in S} \pi(s'|s) = \sum_{s \in S, a \in A} A(a, s, \Phi_t) \Phi_t(a, s)$$

Steady-state capital, interest rate and wage are given as:

equation 58

$$K = \int a d\Phi(a) - D; r = r(K); w = w(K)$$

Aiyagari steady state is given as:

equation 59

$$r_t = r, w_t = w = \omega(r)$$
$$\bar{b}_t = \bar{b} = \min\left\{b, \frac{wl_{\min}}{r} - D\right\} \equiv \bar{b}(w, r, D)$$

We define that $x_t \equiv a_t + \bar{b}; z_t \equiv wl_t + (1 + r)a_t + \bar{b} - \tau$ it follows that $z_t \equiv wl_t(1 + r)x_t - \zeta$,where z_t are the total resources in the economy available at time t and x_{t+1} is investment in t and

equation 60

$$\zeta \equiv r\bar{b} + \tau = r\left[\bar{b} + D\right] = \zeta(w, r, D)$$

If $-\Delta\bar{b} = -\Delta D$ then ζ is independent of D. Individual consumption and resources of individual are given as:

equation 61

$$c_t = z_t - x_{t+1}\,; z_{t+1} = ws_{t+1} + (1 + r)x_{t+1} - \zeta$$

Value function in terms of z is:

equation 62

$$V(z) = \max_{0 \le 0 \le z} U(z - x) + \beta \sum V(z')\pi(s')$$

s.t. $z' \equiv ws' - \zeta + (1 + r)x$. Abou the optimal consumption individual wealth dynamics in this economy is given as:

equation 63

$$c_t = m \cdot \left[(1 + r)a_t + w_t s_t + h - (t + 1) = m \cdot \left[z_T + (h_{t+1} - \bar{b}\right]\right]$$

Where h_{t+1} is the present value of labor income and m is the marginal propensity to consume out of effective wealth and $m \in (0,1)$ and $h_{t+1} \geq \bar{b}$, so that $c_T = \bar{c} + m \cdot z_t$ where $\bar{c} > 0$ and $m \in (0,1)$.Now in Krusell-Smith dynamics:]= approximate constrained equilibrium is given as:

equation 64

$$V(a, s, \mathrm{m}) = \max U(c) + \beta \sum_{(s' \in S)} V(a', s', \mathrm{m}')\pi(s'|s)$$

Manuscript received: 21.11.2022
Accepted: 06.12.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 7-25
Online: ISSN **2671-3810**
UDC: 339.13.053-057.182:330.88
Original scientific paper
https://doi.org/10.46763/IJEMT2222007j

$$V(a,s,\Phi) = \max U(c) + \beta \sum_{(s' \in S)} V(a',s',\Phi')\pi(s'|s)$$

s.t. $a' = w(\Phi')s' + [1 + r(\Phi')][a - c] - r(\Phi')D; c \geq a, a' \in A(\Phi); \mathrm{m}' = \widehat{\mathrm{G}}(\mathrm{m}); A(a,s,\mathrm{m}) = argmax\{..\}$.Now, given that $\Phi\_)$ ad the rule A , compute $\{m_t, \Phi_t\}_{t=0}^{\infty}$ by :

equation 65

$$\Phi_{t+1}(a,s) = \sum_{s \in S} \Phi_t(a,s) 1_{[\hat{A}(a,s,m_t)=a']}\, \pi(s,s')$$

And $\varepsilon_t \equiv m_{t+1} - \hat{G}(m_t)$ are very small.

RESULTS AND DISCUSSION

Consumption savings problem and endogenous labor supply per Achdou et al.(2022). This section uses MATLAB codes used for computation in Achdou et al.(2022)m and published in Benjamin Moll web site :Benjamin Moll Heterogeneous Agent Models in Continuous Time London School of economics and political science, See: https://benjaminmoll.com/codes/ . The aim here is to depict graphically what was written previously theoretically about Huggett (1993) model. This problem outlined here is consumption-savings problem and endogenous labor supply. Here individuals solve:

equation 66

$$\max_{\{c_t,l_t\}_{t\geq 0}} \mathbb{E}_0 \int_0^{\infty} u(c_t,l_t)dt \; s.t. \; \dot{a}_t = wz_t l_t + ra_t - c_t \; ; a_t \geq \underline{a}$$

Where, $z_t \in \{z_1, z_2\}$ follows a two step Poisoon process with intensities λ_1, λ_2. Now individuals endogenously choose labor supply l,here we assume that period utility function is given as:

equation 67

$$u(c,l) = \frac{c^{(1-\gamma)}}{1-\gamma} - \frac{l^{1+\frac{1}{\varphi}}}{1+\frac{1}{\varphi}}$$

HJB equation here is :

equation 68

$$\rho v_j(a) = \max_{c,l} u(c,l) + v_i'(a)\big(wz_j l + ra - c\big) + \lambda_j \Big(v_{-j}(a) - v_j(a)\Big), j = 1{,}2$$

FOC's are:

equation 69

$$u_c\Big(c_j(a), l_j(a)\Big) = v_j'(a)$$
$$-u_l\Big(c_j(a), l_j(a)\Big) = v_j'(a) wz_j$$

Intra-temporal FOC is given as:

equation 70

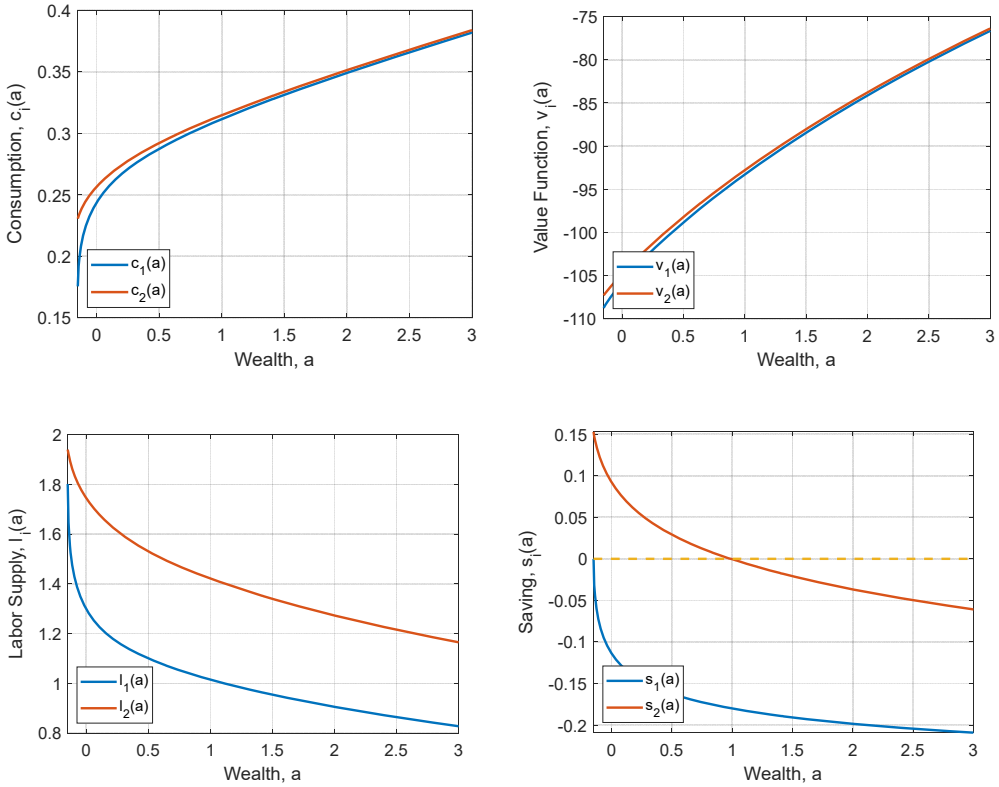
$$-\frac{u_l\Big(c_j(a), l_j(a)\Big)}{u_c\Big(c_j(a), l_j(a)\Big)} = wz_j$$

Parameters here are : $s = 2; \rho = 0.05; r = 0.03; z_1 = 0.1; z_2 = 0.2; z = [z_1, z_2]; la_1 = 1.5; la_2 = 1; la = [la_1, la_2]$;etc. Now resulting graph Figure 1 shows wealth-consumption; wealth-value function; wealth-labor supply, and wealth-saving.

Manuscript received: 21.11.2022
Accepted: 06.12.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 7-25
Online: ISSN **2671-3810**
UDC: 339.13.053-057.182:330.88
Original scientific paper
https://doi.org/10.46763/IJEMT2222007j

Figure 1 Consumption savings problem and endogenous labor supply per Achdou et al.(2022).



Source: solved with Benjamin Moll codes https://benjaminmoll.com/codes/

Credit crunch in Huggett economy (per to Mellior, Gustavo)

This MATLAB code and its algorithm explanation are due to Gustavo Mellior (Kent Uni.2016) and those files can be found at Benjamin Moll web site: https://benjaminmoll.com/codes/ .What is credit crunch? In Bernanke et al.(1991) credit crunch is defined as:"..*We define a bank credit crunch as a significant leftward shift in the supply curve for bank loans, holding constant both the safe real interest rate and the quality of potential borrower*.."A credit crunch (credit squeeze, credit tightening; credit crisis) is a sudden reduction in the general availability of loans or a sudden tightening of the conditions required to obtain a loan from banks. A credit crunch generally involves a reduction in the availability of credit independent of a rise in official interest rates. Economy is described in the text as before, and when credit crunch occurs a household with assets $\underline{a}_{t_0}$ will find itself below the new borrowing limit, and it will reduce consumption by Δa and it moves closer to a_T. And in this example $\underline{a}_{t_0} + 3\Delta a = \underline{a}_T$

equation 71

$$\Delta a = s_1(\underline{a}_{t_0}) = z_1 + r(\underline{a}_T - 3\Delta a) - c_1(\underline{a}_{t_0}); \Delta a = s_1(\underline{a}_{t_0} + \Delta a) = z_1 + r(\underline{a}_T - 2\Delta a) - c_1(\underline{a}_{t_0} + \Delta a); \Delta a = s_1(\underline{a}_{t_0} + 2\Delta a) = z_1 + r(\underline{a}_T - \Delta a) - c_1(\underline{a}_{t_0} + 2\Delta a); 0 = s_1(\underline{a}_{t_0} + 3\Delta a) = z_1 + r(\underline{a}_T) - c_1(\underline{a}_{t_0} + 3\Delta a)$$

When credit crunch occurs previous will be modified to reduce borrowing limit by $3\Delta a$

equation 72

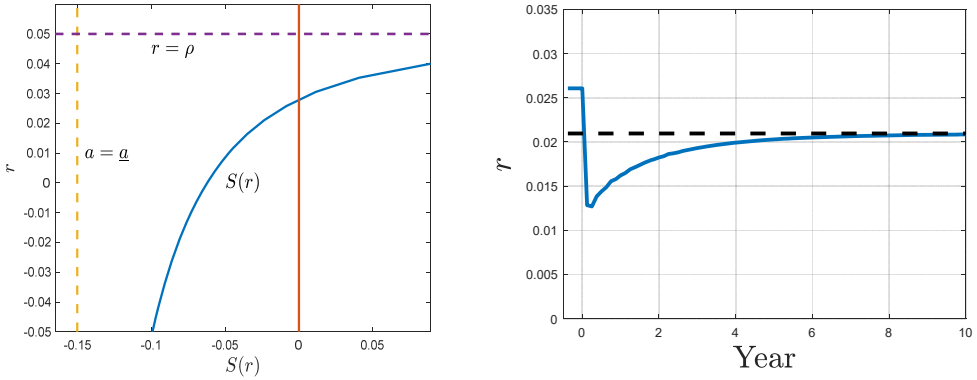
$$\bar{c}_{1,1} - z_1 + r\underline{a}_{t_0} - \Delta a\ ;\ \bar{c}_{2,1} = z_1 + r(\underline{a}_{t_0} + \Delta a) - \Delta a\ ;\ \bar{c}_{3,1} = z_1 + r(\underline{a}_{t_0} + 2\Delta a) - \Delta a\ ;\ \bar{c}_{\underline{a}_T}, 1 = z_1 + r\underline{a}_T;\ \bar{v}'_{i,j} = u'(\bar{c}'_{i,j});\ v_{i,j} = v'_{i,j}\mathbb{1}_{S_F>0} + v'_{i,j}\mathbb{1}_{(s_B<0)} + \bar{v}'_{i,j}\mathbb{1}_{s_B>0>S_F}$$

Manuscript received: 21.11.2022
Accepted: 06.12.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 7-25
Online: ISSN **2671-3810**
UDC: 339.13.053-057.182:330.88
Original scientific paper
https://doi.org/10.46763/IJEMT2222007j

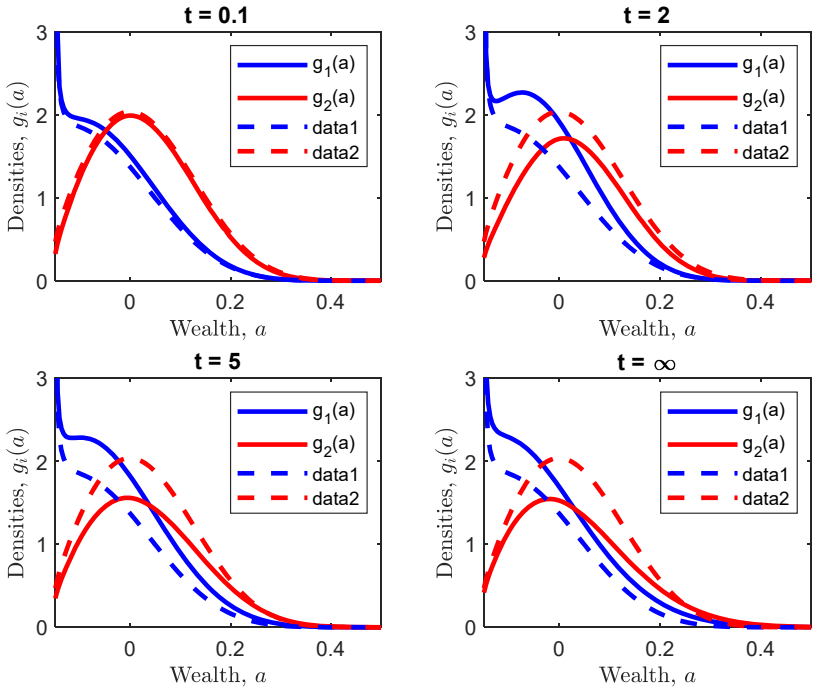
In this example parameters of the model are : $s = 2;\rho = 0.05;z_1 = 0.12;\ z_2 = 0.25;\ z = [z_1, z_2];la_1 = 1.15;\ la_2 = 1,la = [la_1, la_2];r_0 = 0.03;\ r_{min} = 0.001;\ r_{\max} = 0.045;$ $I = 800;$ Equilibrium Found, Interest rate =0.0261. In the next photo equilibrium interest rate and supply of borrowings (loans) priced by that rate are depicted:

Figure 2 equilibrium interest rate



Next densities $g_i(a)$ and wealth a are depicted.

Figure 3 wealth distribution and densities



Krusell-Smith program for "Solving the incomplete markets model with aggregate uncertainty using the Krusell-Smith algorithm" by Maliar et al.(2010)

This part is based on a program written by Lilia Maliar, Serguei Maliar and Fernando Valli (2008) which is available online : https://lmaliar.ws.gc.cuny.edu/codes/ .Paper that uses this code is published as Maliar et al. (2010). Parameters set for the model are:

$\beta = 0.99;$ - discount factor

Manuscript received: 21.11.2022
Accepted: 06.12.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 7-25
Online: ISSN **2671-3810**
UDC: 339.13.053-057.182:330.88
Original scientific paper
https://doi.org/10.46763/IJEMT2222007j

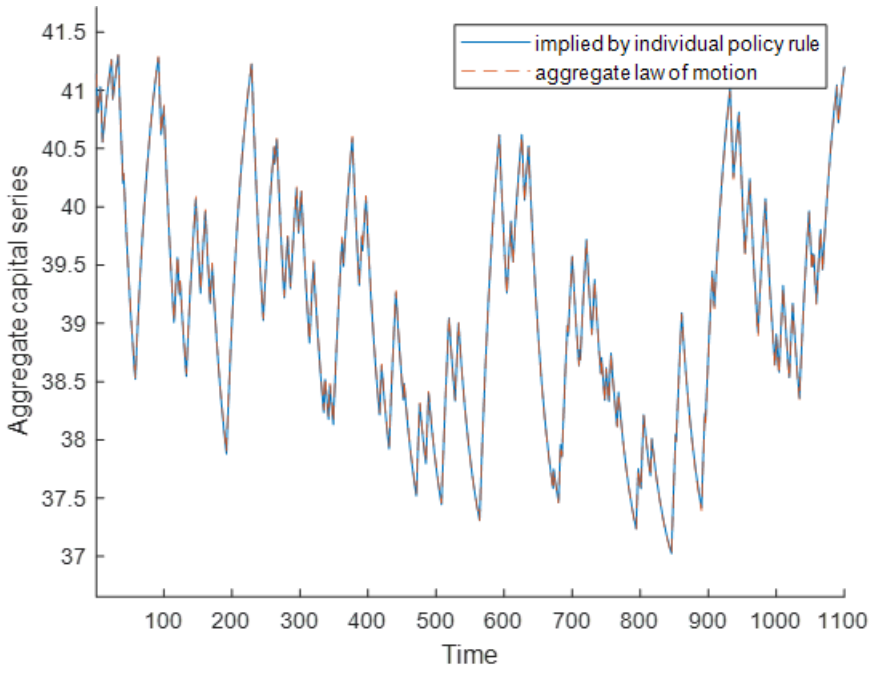
$\gamma = 1$; - utility-function parameter
$\alpha = 0.36$; - share of capital in the production function
δ=0.025; - depreciation rate
δ_a=0.01; - $(1 - \delta_a)$ is the productivity level in a bad state, and $(1 + \delta_a)$ is the productivity level in a good state
$\mu = 0.15$; - unemployment benefits as a share of wage
$\bar{l}$ =1/0.9; - time endowment; normalizes labor supply to 1 in a bad state
$T = 1100$; - simulation length
$ndiscard = 100$; - number of periods to discard
$nstates_{id} = 2$; - number of states for the idiosyncratic shock
$nstates_{ag} = 2$;- number of states for the aggregate shock
$\epsilon_u = 0$; - idiosyncratic shock if the agent is unemployed
$\epsilon_e = 1$; - idiosyncratic shock if the agent is employed
$ur_b = 0.1$; - unemployment rate in a bad aggregate state
$er_b = (1 - ur_b)$; employment rate in a bad aggregate state
$ur_g = 0.04$; - unemployment rate in a good aggregate state
$er_g = (1 - ur_g)$; -employment rate in a good aggregate state

Transition probability matrix is given as:

$$\pi_{i,j} = \begin{pmatrix} 0.525 & 0.35 & 0.03125 & 0.09735 \\ 0.038889 & 0.836111 & 0.002083 & 0.122917 \\ 0.09375 & 0.03125 & 0.291667 & 0.583333 \\ 0.009115 & 0.115885 & 0.024306 & 0.850694 \end{pmatrix}$$

Now, to compute the aggregate law of motion, we use the stochastic-simulation approach of Krusell and Smith (1998). Results are presented in Figure 4.

Figure 4 Accuracy of the aggregate law of motion with random shocks



Manuscript received: 21.11.2022
Accepted: 06.12.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 7-25
Online: ISSN **2671-3810**
UDC: 339.13.053-057.182:330.88
Original scientific paper
https://doi.org/10.46763/IJEMT2222007j

CONCLUDING REMARKS

This paper was investigating model with heterogeneity of agents in incomplete markets in Huggett (1993) ,by using examples solved in MATLAB with codes written for paper by Achdou et al.(2022) .Heterogeneity of individuals was also investigated in Krusell-Smith type economy (with aggregate uncertainty) and with MATLAB code written to find solution to aggregate law of motion and its accuracy with stochastic simulation as per Krusell,Smith (1998). So in conclusion of this review of these models' incomplete markets (heterogenous agents) is that there are developed algorithms for numerically solving the equilibria as equilibria do exist in these types of economics although they may be constrained efficient or inefficient. So, this is one temptation for further exploration in this area and shifting away from representative agent models.

REFERENCES

Abel,A. B.Blanchard,O.J.(1983).An Intertemporal Model of Saving and Investment. Econometrica 51, pp. 675–692.

1. Achdou, Y. Han, J. Lasry, J-M. Lions, P-L. Moll, B.(2022). Income and Wealth Distribution in Macroeconomics: A Continuous-Time Approach, *The Review of Economic Studies*,Volume 89,Issue 1,Pages 45-86
2. Aiyagari, S. R. (1994). Uninsured Idiosyncratic Risk and Aggregate Saving," The Quarterly Journal of Economics, 109(3), pp.659-84
3. Akerlof,G.A.(1978).The Economics of "Tagging" as Applied to the Optimal Income Tax, Welfare Programs, and Manpower Planning, The American Economic Review, Vol. 68, No. 1 (Mar., 1978), pp. 8-19
4. Applebaum, D.(2004). Lèvy Procesess and Stochastic Calculus. Cambridge University Press, Cambrigde, UK.
5. Arnott, R.J. Stiglitz, J.E (1988). Randomization with asymmetric information: A simplified exposition, RAND Journal of Economics 19, pp.344-362.
6. Arrow, J. (1951). An Extension of the Basic Theorems of Classical Welfare Economics. In J. Neyman (ed.), Proceedings of the Second Berkeley Symposium on Mathematical Statistics and Probability (p./pp. 507--532), : University of California Press.
7. Arrow, K. (1953). The Role of Securities in the Optimal Allocation of Risk Bearing, Review of Economic Studies, 1964, 31,pp. 91-96.
8. Arrow, K. J. (1965). Aspects of the Theory of Risk Bearing. The Theory of Risk Aversion. Helsinki: Yrjo Jahnssonin Saatio. Reprinted in: Essays in the Theory of Risk Bearing, Markham Publ. Co., Chicago, 1971, pp.90–109.
9. Arrow, Kenneth J.; Debreu, Gérard (1954). Existence of an equilibrium for a competitive economy. Econometrica. The Econometric Society. 22 (3): 265–90. doi:10.2307/1907353. JSTOR 1907353
10. Auerbach, A. J. Kotlikoff, L. J. (1983). National Savings, Economic Welfare, and the Structure of Taxation. In M. Feldstein (Ed.), Behavioral Simulation Methods in Tax Policy Analysis, pp. 459–498. University of Chicago Press.
11. Bassetto, M. (1999). Optimal fiscal policy with heterogeneous agents. Report, Northwestern University. Available at http://www.nber.org/~bassetto/opttax.html. [678, 679]
12. Bellman R. (1954). Dynamic programming and a new formalism in the calculus of variations. Proc Natl Acad Sci U S A. 1954 Apr;40(4):231-5. doi: 10.1073/pnas.40.4.231. PMID: 16589462; PMCID: PMC527981.
13. Bellman, R. E. (1957). Dynamic Programming. Princeton, NJ.
14. Bellman, R.; Dreyfus, S. (1959). An Application of Dynamic Programming to the Determination of Optimal Satellite Trajectories. J. Br. Interplanet. Soc. 17: pp.78–83.
15. Benhabib, J., A. Bisin, S. Zhu (2015). The Wealth Distribution in Bewley Economies with Capital Income Risk, Journal of Economic Theory, 159(PA), 489{515.

Manuscript received: 21.11.2022
Accepted: 06.12.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 7-25
Online: ISSN **2671-3810**
UDC: 339.13.053-057.182:330.88
Original scientific paper
https://doi.org/10.46763/IJEMT2222007j

16. Bernanke, B. S., Lown, C. S., & Friedman, B. M. (1991). The Credit Crunch. Brookings Papers on Economic Activity, 1991(2), 205–247. https://doi.org/10.2307/2534592
17. Bewley, T. (1986). Stationary monetary equilibrium with a continuum of independently fluctuating consumers. Contributions to mathematical economics in honor of Gérard Debreu, 79.
18. Bewley, T., (1980). The optimum quantity of money, in: J. Kareken and N. Wallace, eds., Models of monetary economies (Federal Reserve Bank of Minneapolis, Minneapolis, MN).
19. Boar, C. V. Midrigan (2020). Efficient Redistribution. mimeo. New York University.
20. Boppart,T.,Krusell,P.Mitman,K.(2018).Exploiting MIT shocks in heterogeneous-agent economies: the impulse response as a numerical derivative. Journal of Economic Dynamics and Control,Volume 89,pp. 68-92
21. Brito,D.L.,Hamilton,J.H.,Slutsky,S.M,Stiglitz,J.E.(1995).Randomization in optimal income tax schedules, Journal of Public Economics,Volume 56, Issue 2
22. Chien, Y., Wen, Y. (2020). Optimal Ramsey Taxation in Heterogeneous Agent Economies with Quasi-Linear Preferences, Working Papers 2019-007D, Federal Reserve Bank of St. Louis.
23. Diamond,P,Mirrlees,J.A.(1978).A model of social insurance with variable retirement, Journal of Public Economics,Volume 10, Issue 3, pp. 295-336
24. Fokker, A. D. (1914). Die mittlere Energie rotierender elektrischer Dipole im Strahlungsfeld. Ann. Phys. 348 (4. Folge 43):pp. 810–820.
25. Geanakoplos, J. (1990). An introduction to general equilibrium with incomplete asset markets. Journal of Mathematical Economics, 19(1-2), pp. 1–38.
26. Geanakoplos, J.D.; Polemarchakis, H.M. (1986). Existence, regularity and constrained suboptimality of competitive allocations when the asset structure is incomplete. In Hell, W.P.; Starr, R.M.; Starrett, D.A. (eds.). Uncertainty, information and communication: Essays in honor of K.J. Arrow. Vol. 3. Cambridge University Press. pp. 65–95. ISBN 9780521327046.
27. Greenwood, J., Hercowitz, Z., Krusell, P. (2000).The role of investment-specific technological change in the business cycle, European Economic Review, 44(1), pp.91-115.
28. Guerrieri, V., G. Lorenzoni, L. Straub, and I. Werning (2020). Macroeconomic Implications of COVID-19: Can Negative Supply Shocks Cause Demand Shortages? NBER Working Paper 26918.
29. Heathcote,J., Storesletten, K., Violante, G. L.(2009). Quantitative Macroeconomics with Heterogeneous Households. Annual Review of Economics, 1(1), pp.319–354. doi: 10.1146/annurev.economics.05
30. Hopenhayn, H. A. (1992). Entry, Exit, and firm Dynamics in Long Run Equilibrium. Econometrica, 60(5), 1127–1150. https://doi.org/10.2307/2951541
31. Huggett, M. (1993). The Risk-Free Rate in Heterogeneous-Agent Incomplete Insurance Economies, Journal of Economic Dynamics and Control 17, pp.953–969
32. Itô,K.(1951). On stochastic differential equations. Memoirs, American Mathematical Society 4,pp. 1–51. Online
33. Jacobsen.M(1996). Laplace and the Origin of the Ornstein-Uhlenbeck Process. Bernoulli, Vol. 2, No. 3. (Sept. 1996), pp. 271 – 286.
34. Johnson, David S., Jonathan A. Parker, and Nicholas S. Souleles.(2004).The Response of Consumer Spending to the Randomized Income Tax Rebates of 2001. Bureau of Labor Statistics, Princeton University, and University of Pennsylvania (February)
35. Judd, K. L. (1985). Short-Run Analysis of Fiscal Policy in a Simple Perfect Foresight Model.Journal of Political Economy 93, pp.298–319.

Manuscript received: 21.11.2022
Accepted: 06.12.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 7-25
Online: ISSN **2671-3810**
UDC: 339.13.053-057.182:330.88
Original scientific paper
https://doi.org/10.46763/IJEMT2222007j

36. Kaplan, G., B. Moll, G. L. Violante (2018). Monetary Policy According to HANK. American Economic Review 108, pp.697–743.
37. Kolmogorov,A.(1931). Über die analytischen Methoden in der Wahrscheinlichkeitstheorie [On Analytical Methods in the Theory of Probability]. Mathematische Annalen (in German). 104 (1): 415–458 [pp. 448–451].
38. Krusell, P., A. A. Smith (1998).Income and Wealth Heterogeneity in the Macroeconomy,Journal of Political Economy, 106(5), pp.867-896.
39. Kydland, F. E., Prescott, E. C. (1982). Time to Build and Aggregate Fluctuations. Econometrica, 50(6), 1345–1370. https://doi.org/10.2307/1913386
40. Lucas, R.E., (1978). Asset prices in an exchange economy, Econometrica 46, 142991445
41. Lucas, RE. (1987). Models of Business Cycles. New York: Basil Blackwell.
42. Maliar, L. Maliar,S.Valli,F.(2010).Solving the incomplete markets model with aggregate uncertainty using the Krusell–Smith algorithm. Journal of Economic Dynamics and Control, Vol.34.Issue1, pp.42-49
43. Misra, K., and Surico, P. (2014). Consumption, income changes, and heterogeneity: Evidence from two fiscal stimulus programs. American Economic Journal: Macroeconomics 6, no. 4: pp.84-106.
44. Mukoyama,T.(2021).MIT shocks imply market incompleteness, Economics Letters,Volume 198
45. Piketty, T. (2014). Capital in the Twenty-First Century, Belknap Press, Cambridge, MA
46. Planck, M. (1917). Über einen Satz der statistischen Dynamik und seine Erweiterung in der Quantentheorie. Sitzungsberichte der Preussischen Akademie der Wissenschaften zu Berlin. 24: pp.324–341.
47. Pratt, John W. (1964). Risk Aversion in the Small and in the Large. Econometrica. 32 (1/2): pp.122–136.
48. Ragot, X., Grand, F. L. (2017). Optimal Fiscal Policy with Heterogeneous Agents and Aggregate Shocks, 2017 Meeting Papers 969, Society for Economic Dynamics.
49. Revuz,D. Yor, M. (2005). Continuous Martingales and Brownian Motion, Third Edition Corrected. Volume 293, Grundlehren der mathematischen Wissenschaften. Springer, Berlin, 2005.
50. Robbin, Joel W. (2010), Continuity and Uniform Continuity, UW-Madison Department of Mathematics
51. Rudin,W. (1987). Real & Complex Analysis. McGraw-Hill.
52. Stiglitz, J.E. (1982). Self-selection and Pareto efficient taxation, Journal of Public Economics 17, pp.213-240
53. Stiglitz, J.E. (2017). Where modern macroeconomics went wrong, NBER
54. Storesletten K, Telmer CI, Yaron A. (2001). The welfare cost of business cycles revisited: finite lives and cyclical variation in idiosyncratic risk. Eur. Econ. Rev. 45(7): pp.1311–1139
55. Taub, B., (1988). Efficiency in a pure currency economy with inflation, Economic Inquiry 26, pp.567-583
56. Weiss, L.W. (1976) The desirability of cheating incentives and randomness in the optimal income tax, Journal of Political Economy 89, pp.1343-1352.

Web sites:

1. Benjamin Moll Heterogeneous Agent Models in Continuous Time: https://benjaminmoll.com/codes/

Manuscript received: 20.11.2022
Accepted: 24.11.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 26-41
Online: ISSN **2671-3810**
UDC: 338.48-44:303.71(497.7-88)"1961/2021"
Original scientific paper
https://doi.org/10.46763/IJEMT2222026d

ANALYSIS OF TOURIST MOVEMENTS BY TYPES OF PLACES IN R.N. MACEDONIA FROM 1961 TO 2021

Nikola V. Dimitrov
PhD, University "Goce Delchev" - Stip, Faculty of Tourism and Business Logistics
nikola.dimitrov.ugd.edu.mk

Abstract
The paper deals with tourist movements by types of places in RN. Macedonia[1] for selected years from the period 1961 - 2021. The analysis of tourist movements was made on the basis of extensive statistical data on tourists and overnight stays, for five groups of types of tourist places: Skopje, spa, mountain, lake and others. The purpose of the paper is to see the participation and the role of each type of tourist site in tourist movements for the entire statistical period of 60 years. The text is the result of the analysis of ten thematic tables and ten graphs, all integral parts of the paper. The paper presents the reasons for fluctuations in tourist movements by types of places, and recommendations are given for the growth and improvement of tourist movements by types of places.

Key words: tourism, domestic, foreign, tourists, overnight stays, types of tourist places
JEL Classification: Z32 Tourism and Development; Z39 Tourism: Other

INTRODUCTION

There are few papers in which tourist movements are processed in a period of more than three decades (Panov, 1996, Dimitrov, 2017), and even rarer are papers in which tourist movements are processed by types of places (Panov, 1996). The analysis in this paper is the first of its kind to process a period of 60 years of tourist movements in places. The newspaper uses broad statistics for tourism, thematic publications of the State Statistical Office, Statistical Yearbook of the Republic of Macedonia, for the period 1961-2019, as well as data from the electronic statistics base (Meta Stat.).

MATERIAL AND METHODS

Materials used in the research are statistical publications and other meta statistical data from the SSO on tourist movements. The main method is descriptive analysis and statistical data processing. Tables and graphs are an instrument through which tourist movements by types of places can be traced visually and graphically.

RESULTS AND DISCUSSION

We divide the research results into two parts. The first part includes an analysis of statistical data on total tourist movements for tourists and overnight stays for selected years of the specified period (1961-2021). (See: Table 1, 2 and 3 and Graphs 1,2,3,4). The second part includes an analysis of statistical data on tourist movements (tourists and overnight stays) by types of places: Skopje, spa, mountain, lake places and others. (See: Tables 4-10 and Graphs 5-10).

Analysis of total tourist movements

[1] *Additions to the name Macedonia due to political reasons in the last eight decades (1944-2019): Democratic Federal Republic of Macedonia, DFRM (1944-1946); People's Republic of Macedonia, PRM (1946-1963); Socialist Republic of Macedonia, SRM (1963-1991); Republic of Macedonia, RM (1991-2019), recognized by 133 countries worldwide; application to the UN with temporary reference Former Yugoslav Republic of Macedonia, FYROM (1993-2019); Republic of Northern Macedonia, RNM (2019-). https://en.wikipedia.org/wiki/North_Macedonia retrieved on 08.12.2021. In the text, we will use the abbreviated name of the country, that is, only the initial letters of the adjectives or RN Macedonia.*

Manuscript received: 20.11.2022
Accepted: 24.11.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 26-41
Online: ISSN **2671-3810**
UDC: 338.48-44:303.71(497.7-88)"1961/2021"
Original scientific paper
https://doi.org/10.46763/IJEMT2222026d

From the data listed in table 1., for S.R. Macedonia, we present the following observations. Tourist movements in the period from 1961 to 1987 recorded continuous growth, for tourists from an absolute number of 856,136 tourists or an increase of 261.8%, and for overnight stays of 297,2137 nights or an increase of 295.4%. In that period, the Republic of Macedonia was part of SFR Yugoslavia, which was a significantly larger country in terms of area and population with a well-organized system of "state tourism", and later "self-governing - worker tourism". The peak years for tourists and overnight stays were 1986 and 1987, with over 1,118,000 tourists and over 3,900,000 overnight stays with an average tourist stay of 3.3 days. After the independence of the Republic of Macedonia in 1991, and as a result of economic transition and political conditions, tourist movements in the period 1991-2001 recorded a decrease by 376,970 tourists or -113% and by 1,485,902 overnight stays or -118%. Immediately after, from the following year, a continuous increase in tourist movements with a maximum in 2019, of 1,184,963 tourists (this number of tourists exceeds the maximum since 1987) and 3,262,398 nights, with an average tourist stay of 2.7 days . (See Table 1 and Charts 1 and 2.). This increase in tourist movements has been interrupted in 2020 and 2021, and the reason for this is the Covid-19 pandemic.

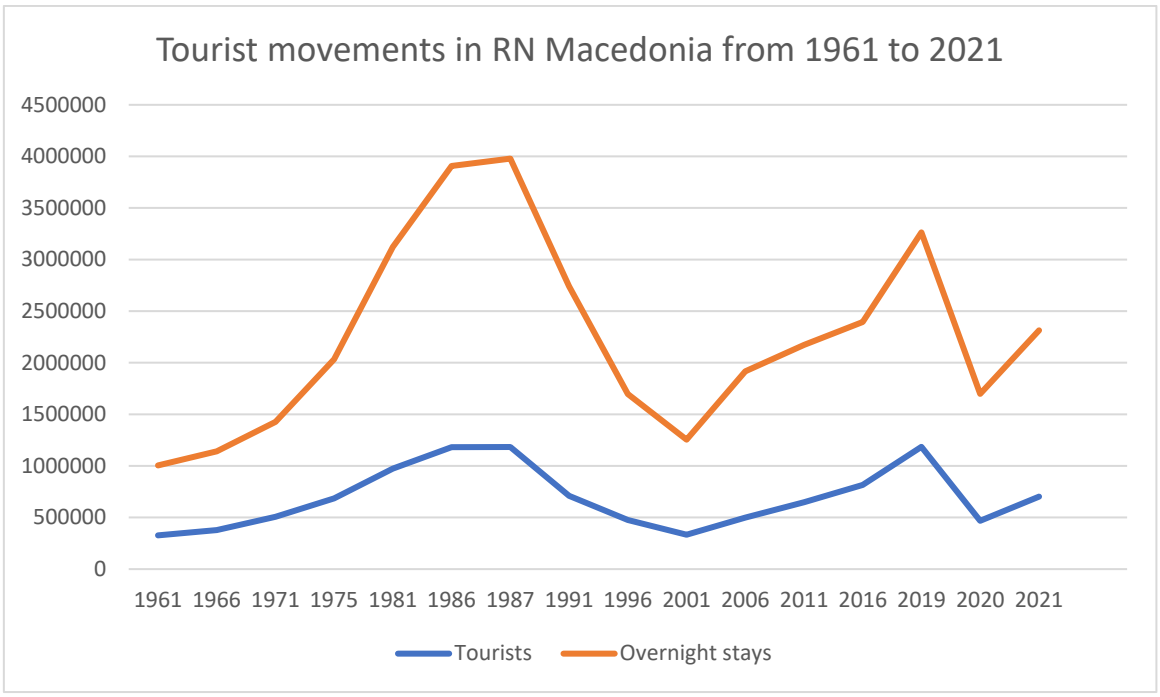
Tables 1: Tourist movements in R. Macedonia* for selected years in the period from 1961 to 2021

Year	Total tourists	Total nights
2021	702463	2313543
2020	467514	1697535
2019	**1184963**	**3262398**
2016	856843	2461160
2015	816067	2394205
2011	647568	2173034
2006	499473	1917385
2001	333308	1254582
1996	476205	1696930
1991	710278	2740484
1987	**1183160**	**3978028**
1986	1180806	3907111
1981	973518	3122190
1975	685314	2033038
1971	507385	1426398
1966	378572	1141467
1961	327024	1005891

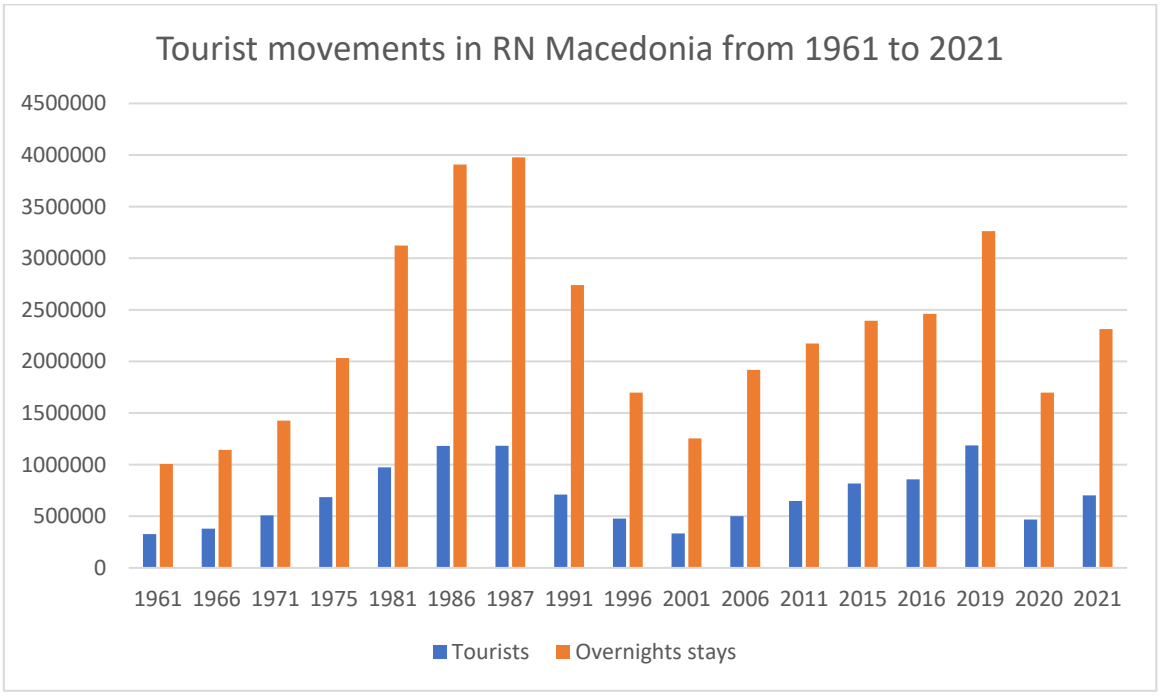
* Source: State Statistical Ofice of the Republic of Macedonia (SSO). Statistical yearbook for SFRJ, PRM, SRM, 1961, 1962, 1966, 1967, 1971, 1972, 1976, 1981, 1982, 1986, 1987, 1988, Skopje (in Macedonian) SSO. Statistical yearbook for Republic of Macedonia, 1991, 1992, 1997, 1998, 2001, 2002, 2006, 2007, 2011, 2012, 2016, 2017, 2018, Skopje (in Macedonian); SSO. Tourism in Republic of Macedonia, Statistical review, 2006-2010, 2007-2011, 2008-2012, 2009-2013, 2010-2014, 2011-2015, Skopje (in Macedonian); SSO: Statistical Yearbook of the Republic of North Macedonia in 2019, 2020, 2021. (in Macedonian); Calculated and compiled NVD
https://www.stat.gov.mk/PublikaciiPoOblast.aspx?id=34&rbrObl=37
http://makstat.stat.gov.mk/PXWeb/pxweb/mk/MakStat/MakStat__TirizamUgostitel__Turizam

Manuscript received: 20.11.2022
Accepted: 24.11.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 26-41
Online: ISSN **2671-3810**
UDC: 338.48-44:303.71(497.7-88)"1961/2021"
Original scientific paper
https://doi.org/10.46763/IJEMT2222026d



Figures 1: Tourist movements in RN Macedonia from 1961 to 2021



Figures 2: Tourist movements in RN Macedonia from 1961 to 2021

Table 2 shows the number of tourist movements according to the number of domestic and foreign tourists. From 1961 to 1987, tourists from other republics of the common SFRY were included in the section of domestic tourists. Thus, the participation of domestic tourists is significantly higher than the number of foreign tourists, with values from 89.6% to 10.4% in 1961, to 79.9% and 20.1% in 1987. Changes in favor of foreign tourists occur from 2011 onwards, with a maximum participation of 63.9% versus 36.1% in favor of foreign tourists (See: Table 2.)

Manuscript received: 20.11.2022
Accepted: 24.11.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 26-41
Online: ISSN **2671-3810**
UDC: 338.48-44:303.71(497.7-88)"1961/2021"
Original scientific paper
https://doi.org/10.46763/IJEMT2222026d

Tables 2: Numerous movements of domestic and foreign tourists and overnight stays

Year	**Tourists**			**Nights**		
percentage	**Total**	**Domestic**	**Foreign**	**Total**	**Domestic**	**Foreign**
2021	**702463**	**408500**	**293963**	**2313543**	**1643083**	**670460**
2020	467514	349308	118206	1697535	1444605	252930
2019	1184963	427370	757593	3262398	1684627	1577771
%	*100*	*36,1*	*63,9*	*100*	*51,6*	*48,4*
2016	856843	346359	510484	2461160	1407143	1054017
2015	816067	330537	485530	2394205	1357822	1036383
2011	**647568**	320097	327471	**2173034**	1417868	755166
2006	499473	297116	202357	1917395	1474550	442845
2001	333308	234362	98946	1254582	1041831	212751
1996	476205	340068	136137	1696930	1419665	277265
1991	710278	415955	294323	2740484	2164146	576338
1987*	1183160	944805	238355	3978028	3466113	511915
%	*100*	*79,9*	*20,1*	*100*	*87,1*	*12,9*
1986*	1180806	951571	229235	3907111	3426720	480391
%	*100*	*80,6*	*19,4*	*100*	*87,7*	*12,3*
1981*	973518	795358	178160	3122190	2765447	356743
1975*	685314	496153	189161	2033038	1660126	372912
1971*	507385	372494	134891	1426398	1188127	238271
1966*	378572	283194	95378	1141467	981820	159647
1961*	327024	292898	34126	1005891	953298	52593
%	*100*	*89,6*	*10,4*	*100*	*94,8*	*5,2*

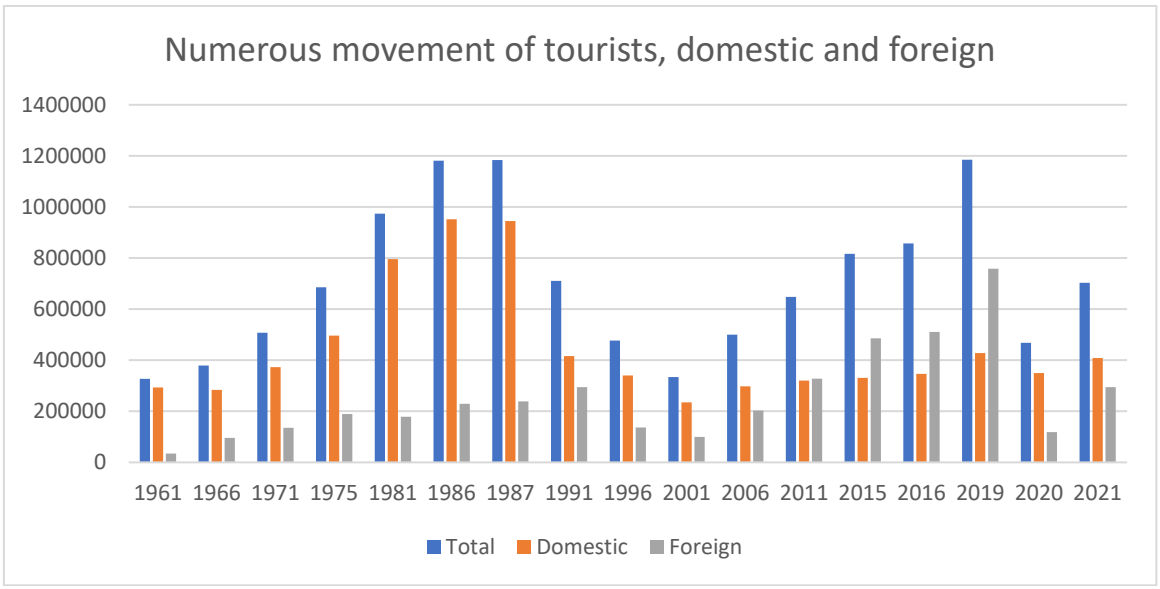
*Domestic - summarized with the other republics of the common state of SFRYugoslavia
* Source: State Statistical Ofice of the Republic of Macedonia (SSO). Statistical yearbook for SFRJ, PRM, SRM, 1961, 1962, 1966, 1967, 1971, 1972, 1976, 1981, 1982, 1986, 1987, 1988, Skopje (in Macedonian) SSO. Statistical yearbook for Republic of Macedonia, 1991, 1992, 1997, 1998, 2001, 2002, 2006, 2007, 2011, 2012, 2016, 2017, 2018, Skopje (in Macedonian); SSO. Tourism in Republic of Macedonia, Statistical review, 2006-2010, 2007-2011, 2008-2012, 2009-2013, 2010-2014, 2011-2015, Skopje (in Macedonian); SSO: Statistical Yearbook of the Republic of North Macedonia in 2019, 2020, 2021. (in Macedonian); Calculated and compiled NVD
https://www.stat.gov.mk/PublikaciiPoOblast.aspx?id=34&rbrObl=37
http://makstat.stat.gov.mk/PXWeb/pxweb/mk/MakStat/MakStat__TirizamUgostitel__Turizam

We registered similar processes in tourist movements according to the number of domestic and foreign overnight stays. Thus, the share of domestic overnight stays is significantly higher than foreign overnight stays, from 94.8% to 5.2% in 1961, to 87.1% to 12.9% in 1987. From 1991 onwards, the share of domestic overnight stays in the total has decreased with greater dynamics, and in 2019 we register the following share of 51.6% versus 48.4% for foreign overnight stays. (See: Table 2 and Graph 3 and 4.).

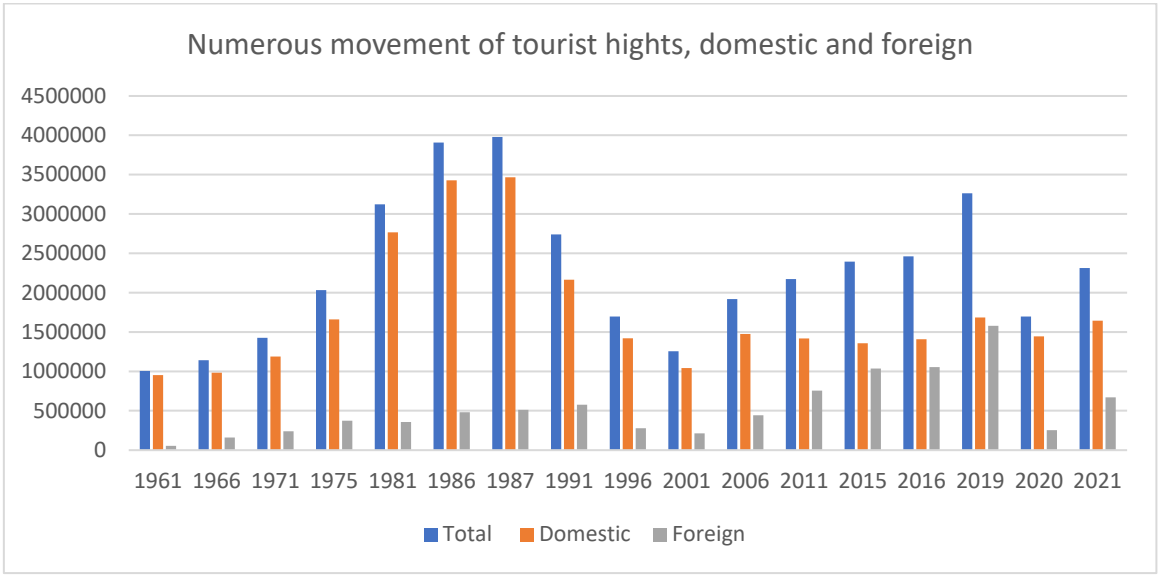
Table 3 shows the average stay in days. From this table, we note that the shortest stay of tourists was in 1971, only 2.8 days, and the longest was in 2006, 3.8 days. Domestic tourists throughout the entire period have an average stay of over 3 days, with a minimum of 3.18 in 1971, and a maximum of 5.2 days in 1991, while foreign tourists had a minimum stay in 1961. of 1.5 days and a maximum of 2.3 days in 2011. and 2.28 in 2021 (See: Table 3.).

Manuscript received: 20.11.2022
Accepted: 24.11.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 26-41
Online: ISSN **2671-3810**
UDC: 338.48-44:303.71(497.7-88)"1961/2021"
Original scientific paper
https://doi.org/10.46763/IJEMT2222026d



Graph 3: Numerous movement of tourists, domestic and foreign



Graph 4: Numerous movement of tourist nights, domestic and foreign

Tables 3. Average tourist stay in days

Year	Average stay in days						
	Total	Domestic	Foreign	Year	Total	Domestic	Foreign
2021	**3,29**	**4,02**	**2,28**	1991	3,85	5,20	1,95
2020	3,63	4,13	2,13	1987	***3,36***	*3,66*	*2,14*
2019	*2,75*	*3,94*	*2,08*	1986	*3,30*	*3,60*	*2,09*
2016	2,87	4,06	2,06	1981	3,20	3,47	2,00
2015	2,93	4,10	2,13	1975	2,96	3,34	1,97
2011	3,35	4,42	**2,30**	1971	**2,81**	3,18	1,76
2006	**3,83**	**4,96**	2,18	1966	3,01	3,46	1,67
2001	3,76	4,44	2,15	1961	*3,07*	*3,25*	***1,54***
1996	3,56	4,17	2,03	*Calculated and compiled NVD*			

Manuscript received: 20.11.2022
Accepted: 24.11.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 26-41
Online: ISSN **2671-3810**
UDC: 338.48-44:303.71(497.7-88)"1961/2021"
Original scientific paper
https://doi.org/10.46763/IJEMT2222026d

Analysis of total tourist movements by types of places

The second part includes an analysis of statistical data on tourist movements, number of tourists and overnight stays by types of places: Skopje, spa, mountain, lake places and others. From the data listed in table 4 to 10 and graphs 5 to 10 by types of places, we present the following observations. In almost the entire period, the number of tourist movements in the lake areas (Ohrid, Prespa and Dojran Lake) dominates with a maximum number registered in 1987 of 456,449 tourists with a participation in the total number of 38.6% and in 2019 with a maximum number registered of 543,855 tourists and participation in the total number of 45.9%. In general, changes in the number of tourists are directly related to the process of transformation of ownership, extinction and emergence of new accommodation facilities, development of tourism, etc. The city of Skopje, as a metropolis, has a significant share in the total number of tourists and overnight stays. For the specified period, we register the following characteristics of tourist movements. The minimum number of tourists, with a participation of 15% and 22%, was in 2001 and 2020, and the reasons are the military conflict and the Covid-19 pandemic. Maximum values were in the distant 1986 and 1987, with 413,396 and 411,797 tourists, with a participation of about 35%. Dominance of the number of tourists who stayed in Skopje, compared to the lake places, were in 1961, 1966, 1971 and 1981 (See: Table 3.). All changes in the numerous movement of tourists are directly related to the transformation of the economy from state-self-governing to private ownership.

Tables 4. Numerical movements of tourists by types of places

Year	**Total tourists by types of places**					
percentage	**Total**	**Skopje**	**Spa**	**Mountainous**	**Lake**	**Others**
2021	702463	166831	20104	56650	360273	98605
2020	467514	72487	12876	52531	270830	58790
2019	1184963	359008	27647	70907	543855	183546
%	*100*	*30,3*	*2,3*	*6,0*	*45,9*	*15,5*
2016	856843	228602	28276	56491	382983	160491
2015	816067	220212	29169	62335	355890	148461
2011	**647568**	141386	27441	71309	279695	127737
2006	499473	108635	19680	40089	264305	66764
2001	333308	74869	19265	38830	142578	57766
1996	476205	103379	23826	50597	225265	73138
1991	710278	221264	26287	55767	290189	116771
1987	1183160	411797	37272	84300	456449	193342
%	*100*	*34,8*	*3,2*	*7,1*	*38,6*	*16,3*
1986	1180806	413396	41913	94615	430427	200455
%	*100*	*35,0*	*3,5*	*8,0*	*36,5*	*17,0*
1981	973518	365774	34653	55766	329283	188042
1975	685314	210697	28807	34799	224780	186291
1971	507385	184205	22196	22436	150119	128429
1966	378572	119445	14686	18566	102875	123000
1961	327024	143083	12313	9357	74054	88217
%	*100*	*43,7*	3,8	2,9	*22,6*	*27,0*

* Source: State Statistical Ofice of the Republic of Macedonia (SSO). Statistical yearbook for SFRJ, PRM, SRM, 1961, 1962, 1966, 1967, 1971, 1972, 1976, 1981, 1982, 1986, 1987, 1988, Skopje (in Macedonian) SSO. Statistical yearbook for Republic of Macedonia, 1991, 1992, 1997, 1998, 2001, 2002, 2006, 2007, 2011, 2012, 2016, 2017, 2018, Skopje (in Macedonian); SSO. Tourism in Republic of Macedonia, Statistical review, 2006-2010, 2007-2011, 2008-2012, 2009-2013, 2010-2014, 2011-2015, Skopje (in Macedonian); SSO: Statistical Yearbook

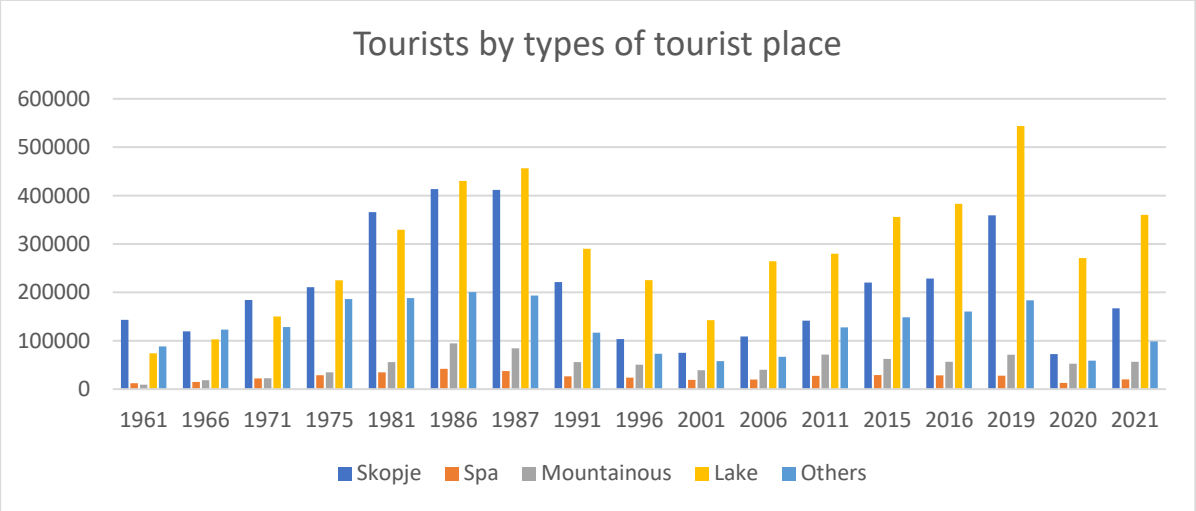
Manuscript received: 20.11.2022
Accepted: 24.11.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 26-41
Online: ISSN **2671-3810**
UDC: 338.48-44:303.71(497.7-88)"1961/2021"
Original scientific paper
https://doi.org/10.46763/IJEMT2222026d

of the Republic of North Macedonia in 2019, 2020, 2021. (in Macedonian); Calculated and compiled NVD
https://www.stat.gov.mk/PublikaciiPoOblast.aspx?id=34&rbrObl=37
http://makstat.stat.gov.mk/PXWeb/pxweb/mk/MakStat/MakStat__TirizamUgostitel__Turizam
Third in tourist movements are places with a common name others (which includes all other smaller tourist and non -tourist sites: cities, villages, monasteries, etc.). Most tourists were in 1986, 1987 and 2019, with a share in the total number of tourists of 17%, 16%and 15%.

Fourth is followed by tourists staying in mountainous areas, with 2.9% in 1961 to 8.0% in 1986 (maximum number 94,615), followed by a decrease, and in 2019 there is a participation of 6.0 %. The numerous movement is proportional to the accommodation facilities in the mountainous areas (hiking homes, resorts, ski resorts, hotels, etc.), as well as with the transition of the economy and the buildings in mountain areas (their transformation, privatization, extinction, etc.).

In fifth place are bathrooms with significant oscillations in the number of tourists and their participation, as a result of the number of baths, from four to a maximum of eight baths and a reduction of the six baths. Thus, in 1961, tourists staying in the bathrooms participated with 3.8%, in 1987 by 3.2%, and the decline culminated in 2019 with only 2.3%. (See: Table 4.)



Graph 5. Tourists by types of tourist place

Table 5 and 6 shows the numerous tourist movement of domestic and foreign tourists by places. From 1961 to 1987, tourists from the other republics of the common SFRY state were together in the field of domestic tourists. In 1961 the biggest visit of domestic tourists was Skopje with 40.5%, then others with 28.6%, lake with 23.6%etc. The situation in 1987 changed in favor of the lake places with a share of 41.7%, Skopje with 31.4% etc. Almost throughout the period, domestic tourists visit the lake places, and then Skopje, then others, mountain and spa. In 2019, domestic tourists made the biggest visit to the lake places with a share of 61.8%, followed by others with 13.3%, mountainous with 10.8%, Skopje with 8.8%and spa with 5.3%. (See: Table 5 and Chart 6.)

The tourist movements of foreign tourists in types of places has the next dynamics. The first place for the visit is the capital Skopje, which was visited by 71.6% of foreign tourists in 1961, and in the second place are the lake places with a share of 14.3%.

As tourism is developing, we register certain changes in the participation of foreign tourists and in the rest of the Macedonian space. Thus, the role of the capital declines, and is

Manuscript received: 20.11.2022
Accepted: 24.11.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 26-41
Online: ISSN **2671-3810**
UDC: 338.48-44:303.71(497.7-88)"1961/2021"
Original scientific paper
https://doi.org/10.46763/IJEMT2222026d

increasing in lake places where the number of foreign tourists is constantly increasing. Namely, for the period 1961-2019 the visit of foreign tourists to Skopje decreased by 29.2% (from 71.6% to 42.4%), and lake places increased by 22.7% (from 14.3% at 37%, which is the result of tourism development in the three lakes, Ohrid, Prespa and Dojran). Foreign tourists increase in places under the name of others from 12.7% to 16.7%, and in mountainous areas of 0.2% in 1961 to 3.3% in 2019, and there is a decrease in spa places (from 1.2% at 0.6%). (See: Table 6 and Chart 7.)

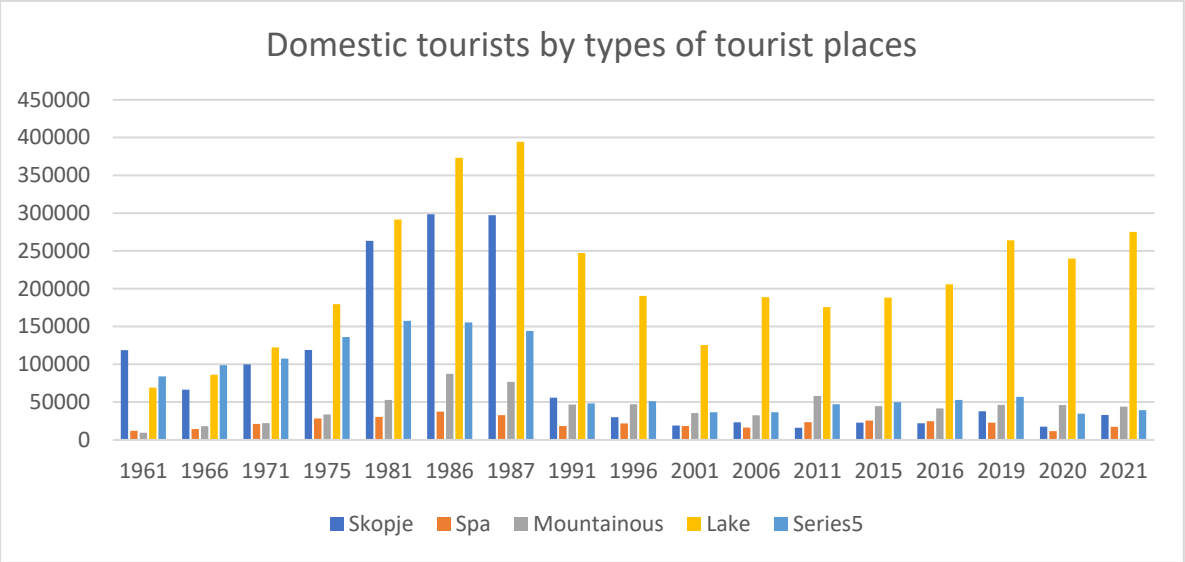
Tables 5. Numerous movement of domestic tourists by types of places

Year	Of that domestic tourists by types of places					
	Total	Skopje	Spa	Mountainous	Lake	Others
2021	408500	32937	17188	43952	275175	39248
2020	349308	17479	11376	46058	239833	34562
2019	427370	37738	22776	46198	263878	56780
%	100	8,8	5,3	10,8	61,8	13,3
2016	346359	21806	24525	41630	205683	52715
2015	330537	22782	25533	44502	188004	49716
2011	320097	15979	23401	58100	175612	47005
2006	297116	23176	16195	32394	188811	36540
2001	234362	18802	18223	35411	125382	36544
1996	340068	29858	21699	47099	190433	50979
1991	415955	55702	18281	46652	247268	48052
1987	944805	297121	32682	76606	394285	144111
%	100	31,4	3,5	8,1	41,7	15,3
1986	951571	298531	37224	87258	373226	155332
%	100	31,4	3,9	9,2	39,2	16,3
1981	795358	263230	30312	52780	291544	157492
1975	496153	118878	28242	33571	179447	136015
1971	372494	99690	21096	21989	122240	107479
1966	283194	66235	14212	17983	86083	98681
1961	292898	118655	11907	9288	69155	83893
%	100	40,5	4,1	3,2	23,6	28,6

* Source: State Statistical Ofice of the Republic of Macedonia (SSO). Statistical yearbook for SFRJ, PRM, SRM, 1961, 1962, 1966, 1967, 1971, 1972, 1976, 1981, 1982, 1986, 1987, 1988, Skopje (in Macedonian) SSO. Statistical yearbook for Republic of Macedonia, 1991, 1992, 1997, 1998, 2001, 2002, 2006, 2007, 2011, 2012, 2016, 2017, 2018, Skopje (in Macedonian); SSO. Tourism in Republic of Macedonia, Statistical review, 2006-2010, 2007-2011, 2008-2012, 2009-2013, 2010-2014, 2011-2015, Skopje (in Macedonian); SSO: Statistical Yearbook of the Republic of North Macedonia in 2019, 2020, 2021. (in Macedonian); Calculated and compiled NVD
https://www.stat.gov.mk/PublikaciiPoOblast.aspx?id=34&rbrObl=37
http://makstat.stat.gov.mk/PXWeb/pxweb/mk/MakStat/MakStat__TirizamUgostitel__Turizam

Manuscript received: 20.11.2022
Accepted: 24.11.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 26-41
Online: ISSN **2671-3810**
UDC: 338.48-44:303.71(497.7-88)"1961/2021"
Original scientific paper
https://doi.org/10.46763/IJEMT2222026d



Graph 6. Domestic tourists by types of tourist places

Tables 6. Numerous movement of foreign tourists by types of places

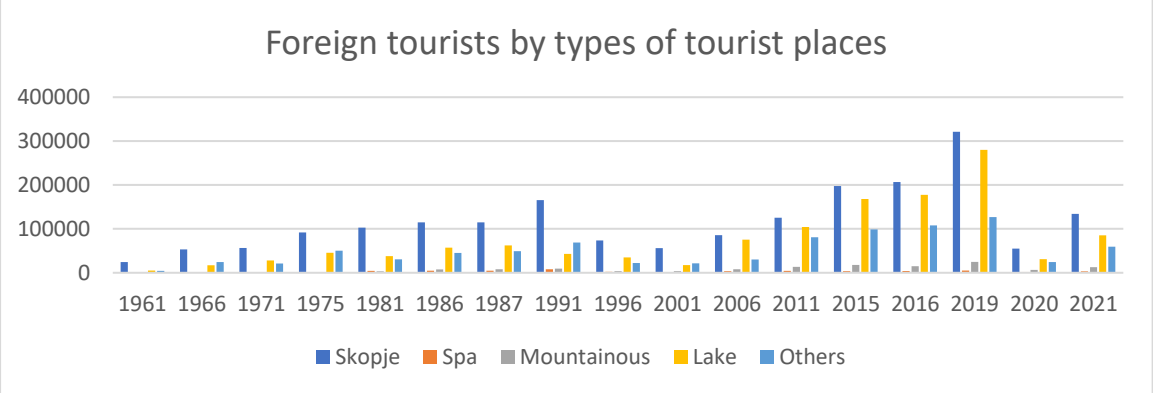
Year	Of that foreign tourists by types of places					
	Total	**Skopje**	**Spa**	**Mountainous**	**Lake**	**Others**
2021	293963	133894	2916	12698	85098	59357
2020	118206	55008	1500	6473	30997	24228
2019	757593	321270	4871	24709	279977	126766
%	100	42,4	0,6	3,3	37,0	16,7
2016	510484	206796	3751	14861	177300	107776
2015	485530	197430	3636	17833	167886	98745
2011	327471	125407	4040	13209	104083	80732
2006	202357	85459	3485	7695	75494	30224
2001	98946	56067	1042	3419	17196	21222
1996	136137	73521	2127	3498	34832	22159
1991	294323	165562	8006	9115	42921	68719
1987	238355	114676	4590	7694	62164	49231
%	100	48,1	1,9	3,2	26,1	20,7
1986	229235	114865	4689	7357	57201	45123
%	100	**50,1**	2,0	3,2	25,0	19,7
1981	178160	102544	4341	2986	37739	30550
1975	189161	91819	565	1228	45333	50276
1971	134891	56359	1100	447	27879	20950
1966	95378	53210	474	583	16792	24319
1961	34126	24428	406	69	4899	4324
%	100	71,6	1,2	0,2	14,3	12,7

* Source: State Statistical Ofice of the Republic of Macedonia (SSO). Statistical yearbook for SFRJ, PRM, SRM, 1961, 1962, 1966, 1967, 1971, 1972, 1976, 1981, 1982, 1986, 1987, 1988, Skopje (in Macedonian) SSO. Statistical yearbook for Republic of Macedonia, 1991, 1992, 1997, 1998, 2001, 2002, 2006, 2007, 2011, 2012, 2016, 2017, 2018, Skopje (in Macedonian); SSO. Tourism in Republic of Macedonia, Statistical review, 2006-2010, 2007-2011, 2008-2012, 2009-2013, 2010-2014, 2011-2015, Skopje (in Macedonian); SSO: Statistical Yearbook of the Republic of North Macedonia in 2019, 2020, 2021. (in Macedonian); Calculated and compiled NVD https://www.stat.gov.mk/PublikaciiPoOblast.aspx?id=34&rbrObl=37

Manuscript received: 20.11.2022
Accepted: 24.11.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 26-41
Online: ISSN **2671-3810**
UDC: 338.48-44:303.71(497.7-88)"1961/2021"
Original scientific paper
https://doi.org/10.46763/IJEMT2222026d

http://makstat.stat.gov.mk/PXWeb/pxweb/mk/MakStat/MakStat__TirizamUgostitel__Turizam



Graph 7. Foreign tourists by types of tourist places

From the data shown in Table 7 we conclude the following. Throughout the period, the number of nights dominated in the lake places with a maximum number in 1987 of 2,642,879 overnight stays and participation in the total of 66,4%, and the second maximum in 2019 of 1,938,169 nights and participation in the total number of 59,4%. In second place is the City of Skopje as a metropolis, with a significant share in the total number of nights of 18.6% in 2019 (in 1961 21.3%), followed by others with 10.7% (in 1961 12, 12, 1%), spa with 6.8%(in 1961 12.5%) and mountainous with 4.5%(in 1961 3.6%). (See: Table 7 and Chart 8.)

Tables 7. Numerous movement of nights by types of places

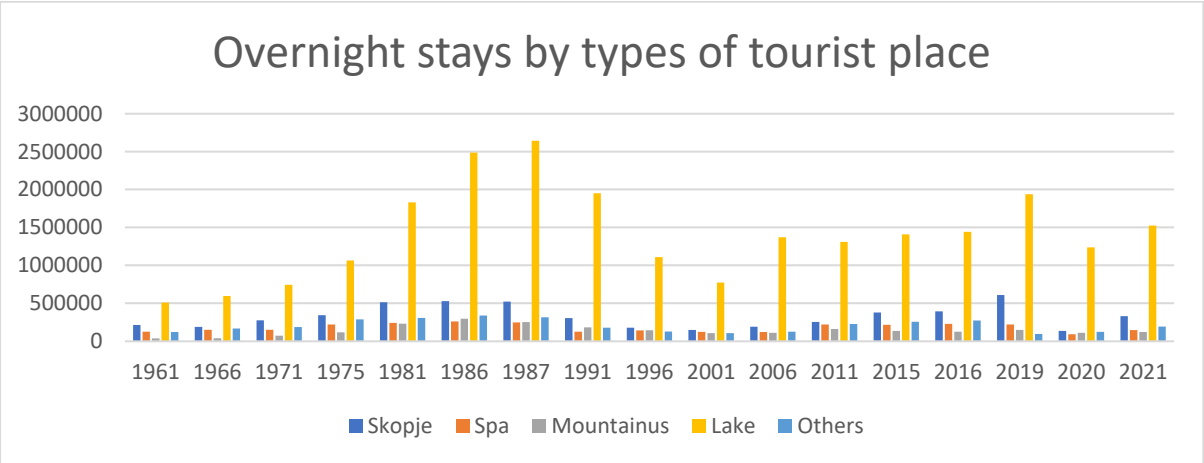
Year	Total nights by types of places					
	Total	**Skopje**	**Spa**	**Mountainous**	**Lake**	**Others**
2021	2313543	329871	145286	120684	1524234	193468
2020	1697535	136289	90805	111268	1237181	121992
2019	3262398	607786	220749	147608	1938169	348086
%	100	18,6	6,8	4,5	59,4	10,7
2016	2461160	392798	227919	125185	1441920	273338
2015	2394205	378253	215541	136436	1407244	256731
2011	**2173034**	254553	220640	161382	1309184	227275
2006	1917385	191314	120298	110337	1369428	126018
2001	1254582	147426	122698	106559	772487	105412
1996	1696930	178651	141110	143127	1107599	126443
1991	2740484	304847	124603	183043	1949604	178387
1987	3978028	521788	246520	252535	2642879	314306
%	**100**	13,1	6,2	6,4	66,4	7,9
1986	3907111	529089	259413	295046	2486335	337228
%	100	13,5	6,6	7,6	63,7	8,6
1981	3122190	512374	241925	230676	1829983	307232
1975	2033038	342572	220901	116734	1065078	287753
1971	1426398	274785	149916	71719	744191	185787
1966	1141467	188791	149582	38698	596081	168315
1961	1005891	213977	125227	36445	508362	121880
%	100	21,3	12,5	3,6	50,5	12,1

* Source: State Statistical Ofice of the Republic of Macedonia (SSO). Statistical yearbook for SFRJ, PRM, SRM, 1961, 1962, 1966, 1967, 1971, 1972, 1976, 1981, 1982, 1986, 1987, 1988, Skopje (in Macedonian) SSO. Statistical yearbook for Republic of Macedonia, 1991, 1992,

Manuscript received: 20.11.2022
Accepted: 24.11.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 26-41
Online: ISSN **2671-3810**
UDC: 338.48-44:303.71(497.7-88)"1961/2021"
Original scientific paper
https://doi.org/10.46763/IJEMT2222026d

1997, 1998, 2001, 2002, 2006, 2007, 2011, 2012, 2016, 2017, 2018, Skopje (in Macedonian); SSO. Tourism in Republic of Macedonia, Statistical review, 2006-2010, 2007-2011, 2008-2012, 2009-2013, 2010-2014, 2011-2015, Skopje (in Macedonian); SSO: Statistical Yearbook of the Republic of North Macedonia in 2019, 2020, 2021. (in Macedonian); Calculated and compiled NVD https://www.stat.gov.mk/PublikaciiPoOblast.aspx?id=34&rbrObl=37 http://makstat.stat.gov.mk/PXWeb/pxweb/mk/MakStat/MakStat__TirizamUgostitel__Turizam
Generally, the changes in the total movement of tourist nights are directly linked to the number of tourists who have visited the state. Increase changes have been initiated by the process of tourism development in the former SFRY, and since 1991 the next decrease as a result of the transformation of ownership, shutdown of workers' resorts, etc., later in 2010. Construction of new accommodation facilities in all kinds of places.



Graph 8. Overnight stays by types of tourist place

From the statistical data in table 8, we state the following. Throughout the entire period, the number of overnight stays realized by domestic tourists dominates in the lake resorts with the maximum number registered in 1987 of 2,346,677 overnight stays, with a participation in the total number of 67.7%, and the second maximum in 2019 of 1,244,961 overnight stays and participation in the total number of 73.9%. In second place are spa resorts, with fluctuations in participation (from 13.1% in 1961, decrease to 6.9% in 1987, then increase to 10.8% in 2019) caused by economic reasons, and the last increase is the result of a social policy for domestic pensioners with low pensions to use a seven-day free spa service in the Macedonian spas. In third place are mountainous places, also with fluctuations in participation (from 3.85 in 1961, 8.2% in 1986, and 6.2% in 2019), in fourth place are Other places (with 12, 1% in 1961, 7.5% in 1987 and 5.6% in 2019) with a decrease in continuity at the expense of the types of places that record an increase. The smallest share of overnight stays by domestic tourists is in the hungry city of Skopje (from 19.1% in 1961, 6.9% in 1987, to 3.5% in 2019), this is a result of the popularity of overnight stays in the lake resorts. places among domestic tourists. (See: Table 8 and Chart 8.)

In general, the changes in the number of tourist nights of domestic tourists are directly related to the number of domestic tourists who stayed in the specified types of places. The changes in the increase were initiated by the process of tourism development in the former SFRY, and since 1991 as a result of the transformation of ownership, the closure of workers' resorts, etc., for the later of 2016, the overnight stays of domestic tourists have increased as a result of the tourist domestic tourism development policy "Home is home".

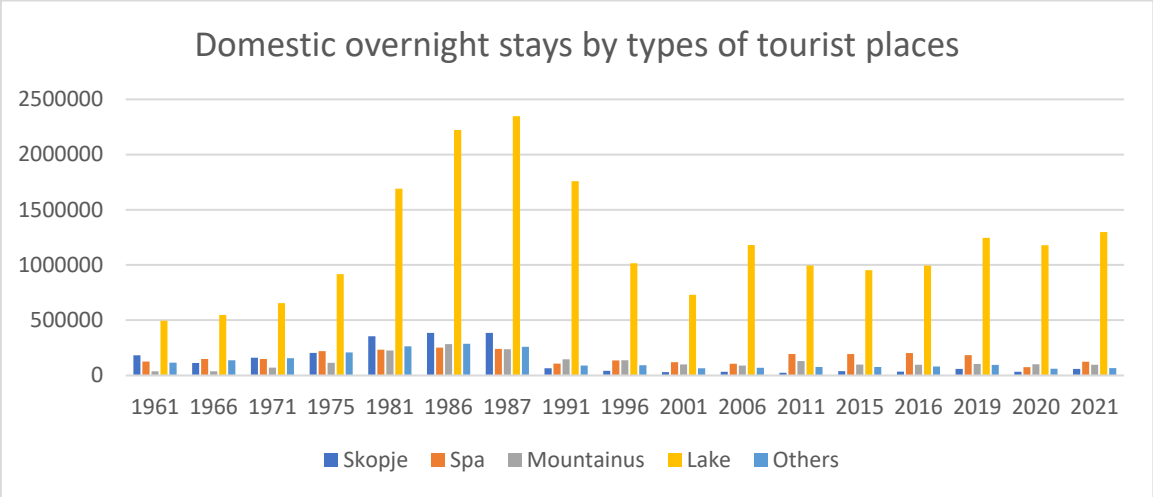
Manuscript received: 20.11.2022
Accepted: 24.11.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 26-41
Online: ISSN **2671-3810**
UDC: 338.48-44:303.71(497.7-88)"1961/2021"
Original scientific paper
https://doi.org/10.46763/IJEMT2222026d

Tables 8. Numerous movement of nights of domestic tourists by types of places

Year	Of that domestic nights by types of places					
	Total	Skopje	Spa	Mountainous	Lake	Others
2021	1643083	59134	123128	96361	1298280	66180
2020	1444605	32063	74399	100268	1178402	59473
2019	1684627	58629	182562	103579	1244961	94896
%	100	3,5	10,8	6,2	73,9	5,6
2016	1407143	34445	201781	95527	995458	79932
2015	1357822	37972	192750	97831	952985	76284
2011	1417868	24434	193274	129937	994400	75823
2006	1474550	32913	104253	89200	1179950	68234
2001	1041831	29958	119230	98481	730074	64088
1996	1419665	40873	135588	136197	1015626	91381
1991	2164146	64520	106572	144961	1758836	89257
1987	3466113	383974	239843	237337	2346677	258282
%	100	11,1	6,9	6,8	67,7	7,5
1986	3426720	384051	251635	282800	2222797	285437
%	100	11,2	7,3	8,3	64,9	8,3
1981	2765447	354313	232817	224822	1690421	263074
1975	1660126	204007	218833	113350	915923	208013
1971	1188127	160442	148478	70658	653598	154951
1966	981820	111822	148988	37483	546589	136938
1961	953298	182351	124812	36265	494425	115445
%	100	19,1	13,1	3,8	51,9	12,1

* Source: State Statistical Ofice of the Republic of Macedonia (SSO). Statistical yearbook for SFRJ, PRM, SRM, 1961, 1962, 1966, 1967, 1971, 1972, 1976, 1981, 1982, 1986, 1987, 1988, Skopje (in Macedonian) SSO. Statistical yearbook for Republic of Macedonia, 1991, 1992, 1997, 1998, 2001, 2002, 2006, 2007, 2011, 2012, 2016, 2017, 2018, Skopje (in Macedonian); SSO. Tourism in Republic of Macedonia, Statistical review, 2006-2010, 2007-2011, 2008-2012, 2009-2013, 2010-2014, 2011-2015, Skopje (in Macedonian); SSO: Statistical Yearbook of the Republic of North Macedonia in 2019, 2020, 2021. (in Macedonian); Calculated and compiled NVD
https://www.stat.gov.mk/PublikaciiPoOblast.aspx?id=34&rbrObl=37
http://makstat.stat.gov.mk/PXWeb/pxweb/mk/MakStat/MakStat__TirizamUgostitel__Turizam



Graph 9. Domestic overnight by types of tourist places

Manuscript received: 20.11.2022
Accepted: 24.11.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 26-41
Online: ISSN **2671-3810**
UDC: 338.48-44:303.71(497.7-88)"1961/2021"
Original scientific paper
https://doi.org/10.46763/IJEMT2222026d

We registered similar processes in tourist movements according to the number of foreign overnight stays, which from 1961 onwards in absolute numbers recorded a constant increase from 52,593 to 1,577,771 or an increase of 30 times. Seen according to types of places, foreign nights have certain oscillations of decreases and increases and vice versa. Thus, the capital city for the stay of foreign tourists and overnight stays is 1961 with a share of 60.1%, in 1987 it decreases to 26.9%, and in 2019 there is an increase to 34.8%. These oscillations are the result of the increased attractiveness for foreign tourists to stay in the lake areas (26.6% in 1961, 57.9% in 1987 and 44.0% in 2019). All other places are attractive for the stay of foreign tourists, thus, the overnight stays of foreign tourists have a share of 12.2% in 1961, 10.8% in 1986 and an increase in 2019. of 16.0%. Mountainous places from 0.3% to 3.0% in 1987. that is, to 2.8% in 2019, and spa places with a continuous increase from 0.8% in 1961, 1.6% in 1986, to 2.4% in 2019. (See: Table 9 and Chart 10.).

In general, changes in the number of foreign tourist nights are directly related to the number of foreign tourists who visited the country. The increase changes were initiated by the process of tourism development in the former SFRY, and from 1991 certain changes as a result of the transformation of ownership, for later from 2010 onwards the overnight stays of foreign tourists increased as a result of the state strategy for the tourism policy for promotion , support and continuous development of tourism in RN. Macedonia.

Tables 9. Numerous movement of night stays by foreign tourists by types of places

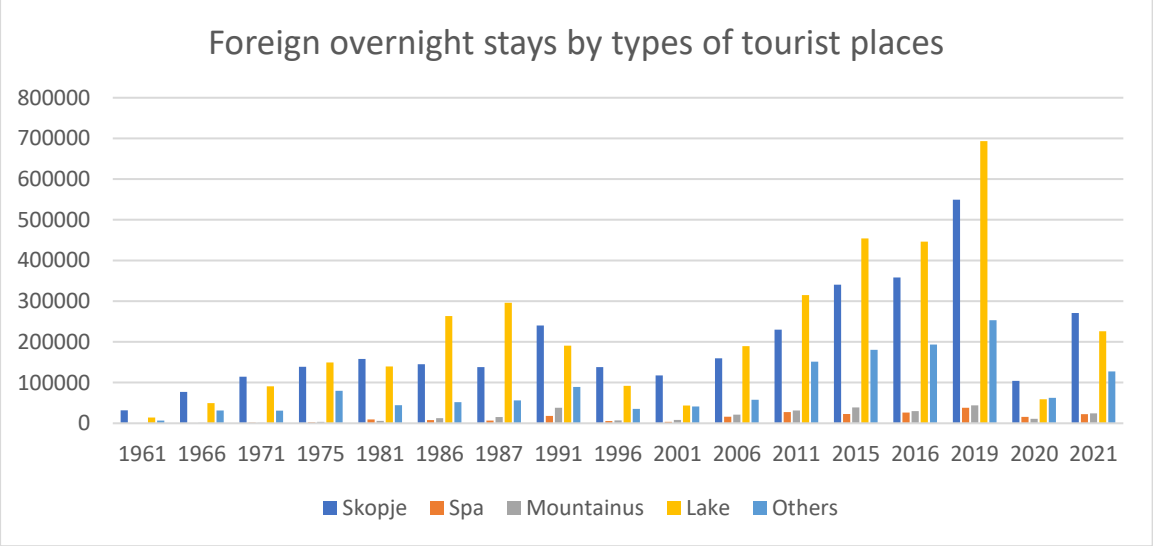
Year	Of that foreign nights by types of places					
	Total	**Skopje**	**Spa**	**Mountainous**	**Lake**	**Others**
2021	670460	270737	22158	24323	225954	127288
2020	252930	104226	15406	11000	58779	62519
2019	1577771	549157	38187	44029	693208	253190
%	100	34,8	2,4	2,8	44,0	16,0
2016	1054017	358353	26138	29658	446462	193406
2015	1036383	340281	22791	38605	454259	180447
2011	755166	230119	27366	31445	314784	151452
2006	442845	159401	16045	21137	189478	57784
2001	212751	117468	3468	8078	43413	41324
1996	277265	137778	5522	6930	91973	35062
1991	576338	240327	18031	38082	190768	89130
1987	511915	137814	6677	15198	296202	56024
%	**100**	26,9	1,3	3,0	57,9	10,9
1986	480391	145038	7778	12246	263538	51791
%	100	30,2	1,6	2,5	54,9	10,8
1981	356743	158061	9108	5854	139562	44158
1975	372912	138565	2068	3384	149156	79740
1971	238271	114343	1438	1061	90593	30836
1966	159647	76969	594	1215	49492	31377
1961	52593	31626	415	180	13937	6435
%	100	60,1	0,8	0,3	26,6	12,2

* Source: State Statistical Ofice of the Republic of Macedonia (SSO). Statistical yearbook for SFRJ, PRM, SRM, 1961, 1962, 1966, 1967, 1971, 1972, 1976, 1981, 1982, 1986, 1987, 1988, Skopje (in Macedonian) SSO. Statistical yearbook for Republic of Macedonia, 1991, 1992, 1997, 1998, 2001, 2002, 2006, 2007, 2011, 2012, 2016, 2017, 2018, Skopje (in Macedonian); SSO. Tourism in Republic of Macedonia, Statistical review, 2006-2010, 2007-2011, 2008-2012, 2009-2013, 2010-2014, 2011-2015, Skopje (in Macedonian); SSO: Statistical Yearbook

Manuscript received: 20.11.2022
Accepted: 24.11.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 26-41
Online: ISSN **2671-3810**
UDC: 338.48-44:303.71(497.7-88)"1961/2021"
Original scientific paper
https://doi.org/10.46763/IJEMT2222026d

of the Republic of North Macedonia in 2019, 2020, 2021. (in Macedonian); Calculated and compiled NVD
https://www.stat.gov.mk/PublikaciiPoOblast.aspx?id=34&rbrObl=37
http://makstat.stat.gov.mk/PXWeb/pxweb/mk/MakStat/MakStat__TirizamUgostitel__Turizam



Graph 10. Foreign overnight stays by types of tourist place

From the statistics in Table 10 we separate the following. The average stay of tourists in Macedonia, almost throughout the period, has increased from 2.8 days (1971) to 3.8 (2006). Domestic tourists staying in the country on average from 3.1 (1971) to 5.2 (1991), ie 4.9 days (2006). Foreign tourists staying an average of 1.5 days in 1961. up to 2.3 days in 2011, ie 2.28 in 2021.

Seen by types of tourist sites, the situation is next. In the first place in the tourist stay are the spa places with the following values, a total stay of 4.7 days in 1991, up to 10.18 days in 1966 (as the first maximum) and 8.0 days in 2016. Or the mean of the tourist stay is about seven days - one week. Domestic tourists stayed from 5.8 in 1991, up to 10.4 days in 1966 and 1961. (as a first maximum), and 8.22 in 2016, and 8.25 days in 2011.

Foreign tourists stayed on average from 1.0 days in 1961 to 10.2 days in 2020. From the data for tourist visit to the spa places we can conclude an upward line - growth, due to the tourism policy for the development of spa and health tourism.
In the second place of the tourist stay are lake places with values of 3.56 in 2019. up to 6.86 days in 1961 (as the first maximum) and 6.7 in 1991. Domestic tourists have a stay of 4.71 in 2019 and 2021. up to 7.14 in 1961 and 7.11 in 1991. Foreign tourists have a stay of 1.89 in 2020, ie 2.5 in 2006. up to 4.76 in 1987 and 4.60 in 1986 The above changes in the length of tourists are primarily the result of economic and political reasons.

In third place are mountainous areas with values of 2.08 in 1966. and in 2019, up to 3.89 in 1961, or 4.13 in 1981. The average stay of domestic tourists in the mountainous areas ranges from 2.08 days in 1966, up to 4.25 days in 1981. The stay of foreign tourists in the mountainous areas is significantly lower with values of 1.66 days in 1986. up to 4.17 days in 1991. However, the mean value of their stay is about 2 days. (See: Table 10).

Fourth and fifth place are almost equal to Skopje and others, with average tourist residence values for 1 to 2 days, for total, domestic and foreign tourists. (See: Table 10).

Tables 10. Average residence of tourists in days by types of places

Manuscript received: 20.11.2022
Accepted: 24.11.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 26-41
Online: ISSN **2671-3810**
UDC: 338.48-44:303.71(497.7-88)"1961/2021"
Original scientific paper
https://doi.org/10.46763/IJEMT2222026d

Year	Average residence in days by types of places						
	Tourists	Total	Skopje	Spa	Mountainous	Lake	Others
2021	**Total**	**3,29**	1,97	7,22	2,13	4,23	1,96
	Domestic	**4,02**	1,79	7,16	2,19	4,71	1,68
	Foreign	**2,28**	2,02	7,59	1,91	2,65	2,14
2020	**Total**	3,63	1,88	7,05	2,11	4,56	2,07
	Domestic	4,13	1,83	6,53	2,17	4,91	1,72
	Foreign	2,13	1,89	10,27	1,69	1,89	2,58
2019	**Total**	*2,75*	1,69	7,98	2,08	3,56	1,89
	Domestic	*3,94*	1,55	8,01	2,24	4,71	1,67
	Foreign	*2,08*	1,70	7,83	1,78	2,47	1,99
2016	**Total**	2,87	1,71	8,06	2,21	3,76	1,70
	Domestic	4,06	1,57	8,22	2,29	4,83	1,51
	Foreign	2,06	1,73	6,96	1,99	2,51	1,79
2015	**Total**	2,93	1,71	7,38	2,18	3,95	1,72
	Domestic	4,10	1,66	7,54	2,19	5,06	1,53
	Foreign	2,13	1,72	6,26	2,16	2,70	1,82
2011	**Total**	3,35	1,80	8,04	2,26	4,68	1,77
	Domestic	4,42	1,52	8,25	2,23	5,66	1,61
	Foreign	2,30	1,83	6,77	2,38	3,02	1,87
2006	**Total**	**3,83**	1,76	6,11	2,75	5,18	1,88
	Domestic	**4,96**	1,42	6,43	2,75	6,24	1,86
	Foreign	**2,18**	1,86	4,60	2,74	2,50	1,91
2001	**Total**	3,76	1,96	6,36	2,74	5,41	1,82
	Domestic	4,44	1,59	6,54	2,78	5,82	1,75
	Foreign	2,15	2,09	3,32	2,36	2,52	1,94
1996	**Total**	3,56	1,72	5,92	2,82	4,91	1,72
	Domestic	4,17	1,36	6,24	2,89	5,33	1,79
	Foreign	2,03	1,87	2,59	1,98	2,64	1,58
1991	**Total**	3,85	1,37	4,74	3,28	6,71	1,52
	Domestic	5,20	1,15	5,82	3,10	7,11	1,85
	Foreign	1,95	1,45	2,25	4,17	4,44	1,29
1987	**Total**	***3,36***	1,26	6,61	2,99	5,79	1,62
	Domestic	***3,66***	1,29	7,33	3,09	5,95	1,79
	Foreign	***2,14***	1,20	1,45	1,97	4,76	1,13
1986	**Total**	*3,30*	1,27	6,18	3,11	5,77	1,68
	Domestic	*3,60*	1,28	6,76	3,24	5,95	1,83
	Foreign	*2,09*	1,26	1,65	1,66	4,60	1,14
1981	**Total**	3,20	1,40	6,98	4,13	5,55	1,63
	Domestic	3,47	1,34	7,68	4,25	5,79	1,67
	Foreign	2,00	1,54	2,09	1,96	3,69	1,44
1975	**Total**	2,96	1,62	7,66	3,35	4,73	1,54
	Domestic	3,34	1,71	7,74	3,37	5,10	1,52
	Foreign	1,97	1,50	3,66	2,75	3,29	1,58
1971	**Total**	**2,81**	1,49	6,75	3,19	4,95	1,44
	Domestic	**3,18**	1,60	7,03	3,21	5,34	1,44
	Foreign	**1,76**	2,02	1,30	2,37	3,24	1,47
1966	**Total**	3,01	1,58	10,18	2,08	5,79	1,36
	Domestic	3,46	1,68	10,48	2,08	6,34	1,38
	Foreign	1,67	1,44	1,25	2,08	2,94	1,29

Manuscript received: 20.11.2022
Accepted: 24.11.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 26-41
Online: ISSN **2671-3810**
UDC: 338.48-44:303.71(497.7-88)"1961/2021"
Original scientific paper
https://doi.org/10.46763/IJEMT2222026d

1961	**Total**	*3,07*	1,49	10,17	3,89	6,86	1,38
	Domestic	*3,25*	1,53	10,48	3,90	7,14	1,37
	Foreign	*1,54*	1,29	1,02	2,60	2,84	1,48

Calculated and compiled NVD

CONCLUDING REMARKS

From the previously stated we can conclude that tourist movements in RS Macedonia have dynamics with unequal oscillations for all types of places. In any case, with small oscillations, for a period of sixty years, the number of tourists and overnight stays in all types of places is visible. The dominant role in the dynamics of the number of tourists and nights are lake places and Skopje, followed by the places others, then the mountainous and finally the spa.

However, if the average tourist stay is analyzed in days, then we register the opposite situation. The spa places dominate the longest stay of tourists for 7.2 days. Second are the lake with 5.1 days, the third are the mountainous areas with 2.7 days, in fourth place is Skopje with 1.6 days and in fifth place are others, with 1.6 days.

From the overall analysis we can conclude that in RN. Macedonia there are real opportunities for greater tourism development in all kinds of places. Promotion of tourism requires more active tourism policy, activation of several institutions and entities, requiring strategic partners to promote, build modern accommodation facilities, and so on.

REFERENCES

1. Panov, N. (1996). Tourism development in the country, I Proceedings Congress geographers of Macedonia held in Ohrid 26-28.11.1995, Skopje, pp. 311-321 (in Macedonian)
2. Dimitrov V. Nikola, (2017) Analysis of Tourism in the Republic of Macedonia 1945-2015. Journal of Tourism and Hospitality Management, 5 (2)., pp. 1-14.
3. State Statistical Ofice of the Republic of Macedonia (SSO). Statistical yearbook for SFRJ, PRM, SRM, 1961, 1962, 1966, 1967, 1971, 1972, 1976, 1981, 1982, 1986, 1987, 1988, Skopje (in Macedonian) SSO. Statistical yearbook for Republic of Macedonia, 1991, 1992, 1997, 1998, 2001, 2002, 2006, 2007, 2011, 2012, 2016, 2017, 2018, Skopje (in Macedonian)
4. SSO. Tourism in Republic of Macedonia, Statistical review, 2006-2010, 2007-2011, 2008-2012, 2009-2013, 2010-2014, 2011-2015, Skopje (in Macedonian)
5. SSO: Statistical Yearbook of the Republic of North Macedonia in 2019, 2020, 2021. (in Macedonian)
6. http://www.stat.gov.mk
7. https://www.stat.gov.mk/PublikaciiPoOblast.aspx?id=34&rbrObl=37
8. http://makstat.stat.gov.mk/PXWeb/pxweb/mk/MakStat/MakStat_TirizamUgostitel_Turizam

Manuscript received: 18.11.2022
Accepted: 24.11.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 42-53
Online: ISSN **2671-3810**
UDC: 005.966:334.722(497.7)
Original scientific paper
https://doi.org/10.46763/IJEMT2222042s

CAREER CHOICE AND EFFECTIVE CAREER MANAGEMENT: ENTREPRENEURSHIP AS BASIS ON THE WAY TO CAREER

Hristina Serafimovska [1*], Marija Apostolova Nikolovska [2]
[1]Faculty of tourism and business logistics, Goce Delchev University, Republic of N. Macedonia
[2] Government of the Republic of N. Macedonia, Republic of N. Macedonia
**corresponding author: hristina.serafimovska@ugd.edu.mk*

Abstract
This paper identifies the importance of effective career management and need for organizational support for employees' career management. Effective career management refers to the policies and practices deliberately designed by the organizations in order to enhance the career effectiveness of their employees. We examined empirically the relationship between opinions of employees about strategy that is most important in career and their opinions about effective career management. In research data were gathered and analyzed fro 102 employees. Some of the opinions of the employees emphasize that a career strategy is a process of realization of the idea for one's own career progress. Their opinions point out that effective career management refers to continuous personal and professional upgrade. By understanding what we want in our careers and how this will affect our nonwork activities, we can be in a better position to plan our future.

Key words: career management, career strategy, entrepreneurial goals, process, employees
JEL Classification: M13, M12, O15

INTRODUCTION

The basis of a quality organization consists of employees who are satisfied with their work, ready to learn and thrive and thus continuously bring progress and profit for themselves and the organization. The foundation of a quality organization is the corporate mission, a reasonable vision of the organization, clearly set goals and a high level of creativity and innovation of employees, aimed at fulfilling the mission, vision and goals. The career and life-management process begin with the development of a personal definition of success (Mackowiak, 1985). Through the integration of the roles of the individual and the organization in the career-management process, employees can optimize their contribution to an organization. Employees can successfully manage their careers by applying the techniques of self-assessment, goal setting, and career planning. But organizations need to work constantly at improving the abilities and advancement potential of their members. The organization's role in career management begins with a sound performance-appraisal system. A good and realistic career plan helps people to see the opportunities in relation to their abilities and includes concrete steps and short-term results to be achieved, which when achieved create a sense of accomplishment that directly affects the motivation and satisfaction of work.

DETERMINATION OF THE TERM "CAREER MANAGEMENT"

Career management is combination of structured planning and the active management choice of one's own professional career (Ball, 1997). Career management definition according to Arnold are the attempts that is made to influence the career development of one of more people and the formal activities of providing training, mentoring and careers advice (Arnold, 1997). Career management is important to an organization which helps it to secure the skills and knowledge for its future and needs (Adamson,1998).

Manuscript received: 18.11.2022
Accepted: 24.11.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 42-53
Online: ISSN **2671-3810**
UDC: 005.966:334.722(497.7)
Original scientific paper
https://doi.org/10.46763/IJEMT2222042s

For the authors Greenhaus, Callanan, and Godshalk the career management model guides individuals through the different phases of their career from figuring out what their first job should be right to navigating the road to retirement (Greenhaus, 2018).

Arnold states that work organizations are compelled (and sometimes choose) to change form, strategy, and size in ways which affect the kinds of work roles and careers available and it can be argued that managing careers is difficult yet necessary for both individuals and organizations in these circumstances (Arnold, 2002).

EFFECTIVE CAREER MANAGEMENT AS A CONTINUOUS AND ACTIVE PROCESS

The organization helps employees in career planning, although career management is primarily an individual responsibility (Dessler, 2007). Employee assistance is provided by reviewing careers, setting career goals, planning activities, and providing career feedback. Quality and effective career management involves three types of information: information on the strategy, goals and plans for work and development, information on the abilities, goals and development potentials of the employees and information on organizational needs and vacancies It is very important for employees to have information that refers to the organization itself, its plans and work needs for timely planning of their careers. It is also important for the organization to have relevant information on employment, their potential and career development goals in order to align with the organizational and individual goals and interests. A common and important feature within models of career management is the career goal (Greco, 2020). Given the unpredictable labor market, effective career management is the responsibility of both individual workers and organizations.

According to Baron and Greenberg a typical career management programme, as part of the larger human resources system, involves efforts to help employees to assess their own career strengths and weaknesses; set priorities and specific career goals; provide information on various career paths and alternatives within the organization and offer employees yearly reviews of their progress towards these goals by managers who have received training in conducting such assessments. The authors Hiirshi and Koen in their paper - Contemporary career orientations and career self-management: A review and integration presents a career counseling intervention framework to help clients self-direct their careers and attain work-nonwork balance (Hirchi, 2021). According to them researchers can use this framework to gain a better understanding of career self-management from a whole-life perspective.

The organization should develop and simultaneously realize the development career of the individual by engaging in accordance with the current competence of the individual, by projecting the future job or managerial role of the individual in accordance with the capabilities through training the employee in accordance with current and planned requirements. working, by evaluating performance, by rewarding and promoting employees based on their performance, by reassigning, checking for other suitable jobs and roles.

ENTREPRENEURSHIP AS A CAREER CHOICE

When we talk about career choice we cannot say that we have fully elaborated this issue, if we consider it outside the concept of entrepreneurship. The decision to be the owner of an enterprise, or to develop innovative potentials within a larger organization (intrapreneurship) undoubtedly requires setting goals and creating an appropriate career plan. It is important to know that career is usually understood as a set of behaviours demonstrated by the individual in the direction of self-improvement. In contrast, entrepreneurship is more understood as an individual behaviour that has as its ultimate goal the promotion of innovation and the manifestation of creative actions. (Ozsungur, 2021)

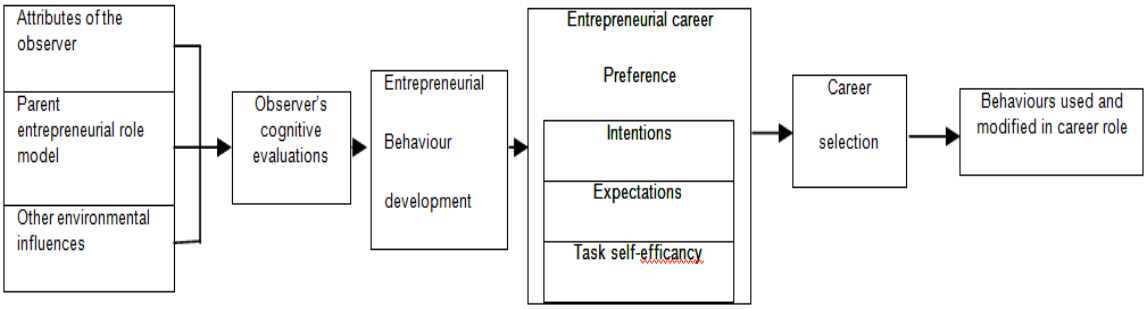
Manuscript received: 18.11.2022
Accepted: 24.11.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 42-53
Online: ISSN **2671-3810**
UDC: 005.966:334.722(497.7)
Original scientific paper
https://doi.org/10.46763/IJEMT2222042s

To understand the connection, let's first start from the essence of entrepreneurship. Entrepreneurship is usually understood as the transformation of innovative and creative ideas into action, as well as turning risks into opportunities. Creative ideas emerge as e result of cognitive coding and information transformation process. In the process of innovation, the integration of new knowledge with existing knowledge takes place. In this sense, entrepreneurship is reduced to the creation and implementation of ideas. Of course, for this to happen, the entrepreneur should have the appropriate knowledge, skills and talent. An individual can develop the idea of an entrepreneur; invest in it to the extent that he can manage his knowledge, skills and talent. An entrepreneur is also expected to possess characteristics of a researcher, organizer, etc. For all these characteristics to be acquired, to be sustainable and to result in a successful entrepreneur, career management is needed. When these two concepts are connected, we arrive at the term career entrepreneurship. (Ozsungur, 2021)

Questions we should ask ourselves are: Why do people choose entrepreneurship as a career choice? or What factors influence the development of entrepreneurial behavior? An answer to these questions can be obtained from the Social Learning Theory which can help to understand and identify the basic determinants of entrepreneurial activity. According to this theory, people perceive and evaluate behavior in their environment. As a result of the environment they develop their attitudes and beliefs, but also set their intentions and goals. (Scheiner, 2009) When we talk about the environment, it should be emphasized that it is the family environment that is the most influential and most of the process of socialization of the person takes place within its framework or by its example. (Jayawarna et al., 2015)

Figure 1 – Process of entrepreneurial career choice from a social learning perspective



Source: Scheiner, W.Ch., 1st Edition (2009) ***Fundamental Determinants of Entrepreneurial Behaviour,*** Gabler, GWV Fachverlage GmbH, Wiesbaden, p. 19

This theory offers four categories of factors (Scheiner, 2009) that can have a significant impact on a career choice decision:

1. **Specific abilities of the person such as genetics, innate gifts, talents, abilities –** these abilities can largely limit the person's preferences.
2. **Environmental conditions and events –** this category is mostly outside the sphere of influence of the individual, but they have a significant impact on the decision-making process. This part includes family experience and resources, because each family teaches and directs its children to different things and depending on the availability of different resources.
3. **Experience gained through learning –** which can be understood as an individual's behavior aimed at generating recognition/rewards (Instrumental Learning Experiences), or behaviour created by observing and learning from real or imagined models (Associative Learning Experience)

Manuscript received: 18.11.2022
Accepted: 24.11.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 42-53
Online: ISSN **2671-3810**
UDC: 005.966:334.722(497.7)
Original scientific paper
https://doi.org/10.46763/IJEMT2222042s

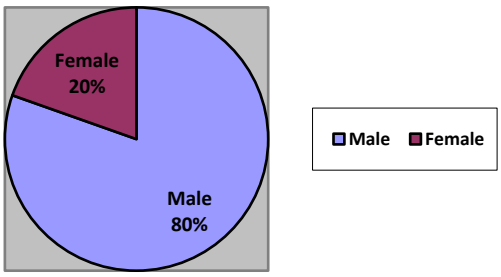
4. **Tasks approach skills –** a category that develops in cases where the individual is faced with unfamiliar problems.

Regarding the choice of an entrepreneurial career as a career choice, there are several empirical studies that show that there is a connection between the decision made by the individual and his family background. An individual is more inclined to choose entrepreneurship as a career path if there is observational learning from a valid model that offers a success story of self-employment. The observed pattern is a powerful determinant and thus the individual may be encouraged or discouraged to make a decision to follow it. Research goes even deeper, distinguishing between the influence of the role of the father and that of the mother on children's determination. Namely, the profession of the father has an influence on the professional determination of the son and daughter, while the role of the mother has a limited influence mostly only on the daughter. On the other hand, research has shown that women are more influenced by the family when deciding to start a business, unlike men who are more independent in this matter. (Scheiner, 2009)

RESULTS AND METHODS

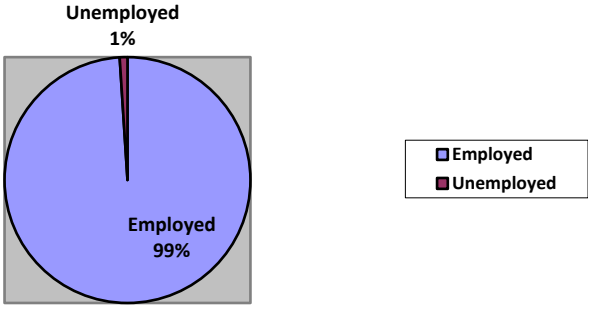
In order to determine the conditions for effective career management in Macedonia, a research was conducted in which a survey technique was used. The survey covered a total of 102 respondents throughout the Republic of Macedonia. It is a simple random sample, which allows to obtain estimates for the characteristics of the entire population to which the sample belongs. As for the demographic characteristics of the sample, the research included respondents from different age groups, different genders - male/female, with different socio-economic status - employed/unemployed and of course with different work experience in order to get an objective picture of the situation.

Figure 2 – Gender of the respondents



Source: Own research

Figure 3 - Socioeconomic status of the respondents

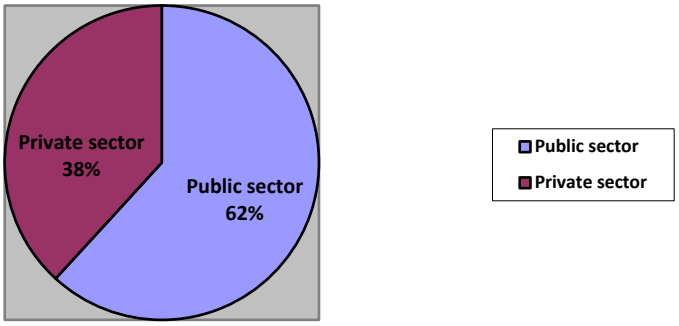


Source: Own research

Manuscript received: 18.11.2022
Accepted: 24.11.2022

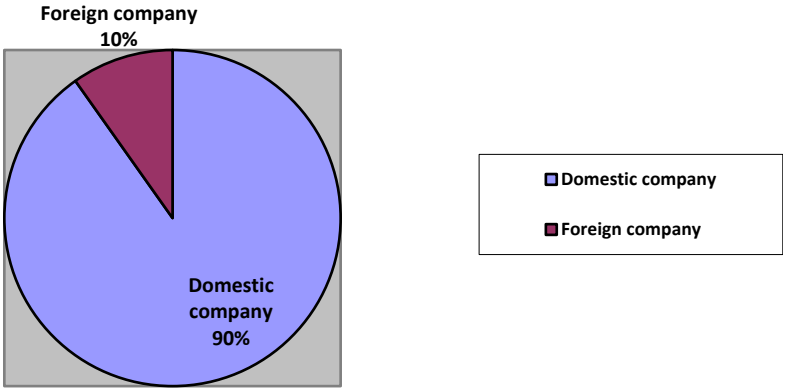
International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 42-53
Online: ISSN **2671-3810**
UDC: 005.966:334.722(497.7)
Original scientific paper
https://doi.org/10.46763/IJEMT2222042s

Figure 4 – The employment sector



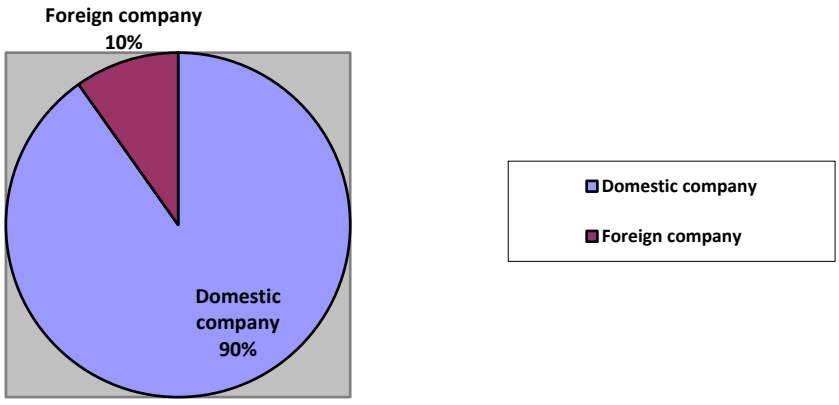
Source: Own research

Figure 5 – Type of company



Source: Own research

Figure 6 – Work experience



Source: Own research

The survey consisted of statements for which respondents could express their attitude in the form of clear approval (agree), partial agreement (partially agree) in the case that their worldview is close to the statement, but not identical to it, it was left to them possibility of

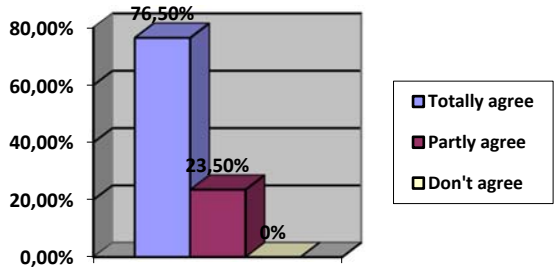
Manuscript received: 18.11.2022
Accepted: 24.11.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 42-53
Online: ISSN **2671-3810**
UDC: 005.966:334.722(497.7)
Original scientific paper
https://doi.org/10.46763/IJEMT2222042s

complete disapproval (disagree). The statements covered several essential aspects on which effective career management depends, such as motivations, prerequisites that need to be met in order to achieve effective career management, factors that influence this process, knowledge and skills that should be available for successful managing this process etc.

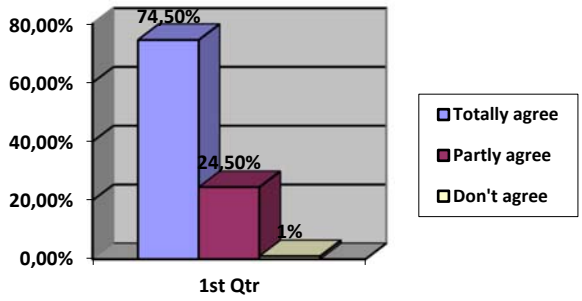
From this research, knowledge should be obtained about the situation regarding this issue in Macedonia, how career management is an act of a conscious process and in which parts interventions are needed to improve the situation.The answers to the claims that if the individual wants to have an effective career management, first of all, as a prerequisite, he should have knowledge about himself, his affinities, advantages and disadvantages on the one hand, and knowledge about the environment as a factor that can influence the realization of the planned on the other hand, can be traced in Figure 7 and Figure 8.

Figure 7 – Effective career management requires excellent self-knowledge



Source: Own research

Figure 8 – Effective career management requires having an accurate assessment of one's environment



Source: Own research

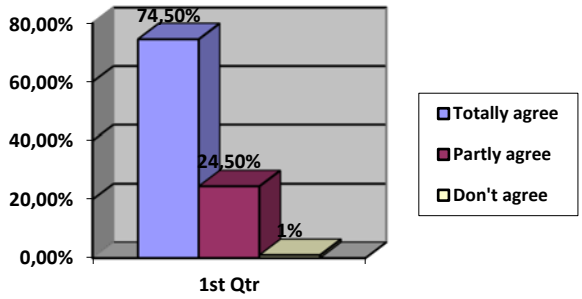
It can be seen that the respondents have a clear idea of the importance of self-knowledge and how influential the external environment can be for effective career management. Both statements have almost equal significance in the perception of the respondents.

As for the conviction that goals should correspond to a person's inner potentials, in terms of values, abilities, interests and preferred lifestyle in order to be realistic, an overwhelming majority of respondents answered positively. (**Figure** 9)

Manuscript received: 18.11.2022
Accepted: 24.11.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 42-53
Online: ISSN **2671-3810**
UDC: 005.966:334.722(497.7)
Original scientific paper
https://doi.org/10.46763/IJEMT2222042s

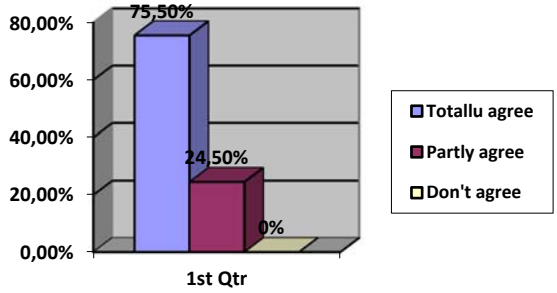
Figure 9 - Effective career management requires developing realistic and conceptual goals that are compatible with one's own values, interests, abilities and preferred lifestyle.



Source: Own research

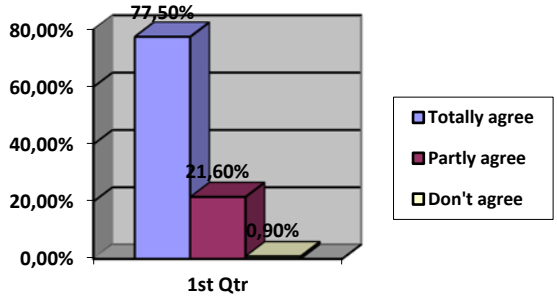
In the section dedicated to the development of a career plan and creating a strategy, the respondents were faced with claims through which it was necessary to determine how much the respondents are aware of the need for a strategic approach to this issue. (Figure 10) The answers provide a clear insight into how important it is for the respondents to have feedback and how important is also to have the skills to develop a strategy. (**Figure** 11, 12)

Figure 10 - Effective career management requires developing and implementing appropriate career strategies.



Source: Own research

Figure 11 - Effective career management requires a continuous feedback process

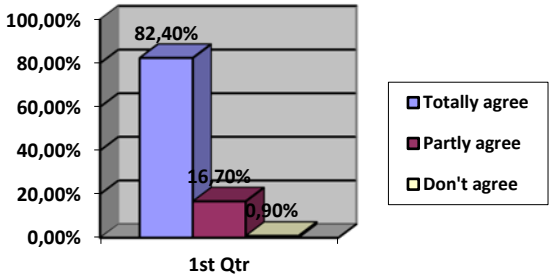


Source: Own research

Manuscript received: 18.11.2022
Accepted: 24.11.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 42-53
Online: ISSN **2671-3810**
UDC: 005.966:334.722(497.7)
Original scientific paper
https://doi.org/10.46763/IJEMT2222042s

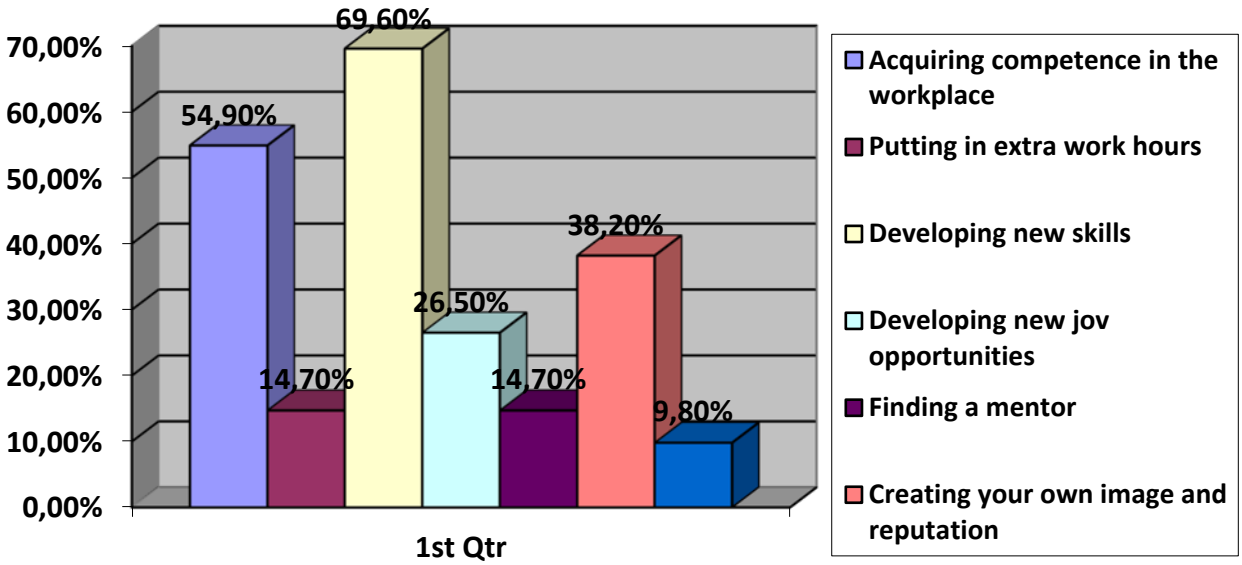
Figure 12 – Having the skills to develop and implement career strategies is key to effective career management



Source: Own research

Also, from the respondents' answers to the question – What do you think constitutes a career strategy? it can be concluded that they have a clear idea of what a career strategy is. The answers mostly move within the framework of the understanding that it is primarily a process, guided by defined goals and taken action. Continuous improvement of own skills through perseverance and dedication in order to achieve the vision. According to the respondents' perception, this is a process in which it is crucial to know one's own advantages and disadvantages. In doing so, respondents were offered to choose which of the listed strategies is crucial and most important according to their understanding in order to achieve effective career management.(**Figure 13)**

Figure 13 - Which strategy do you think is most important in career management?



Source: Own research

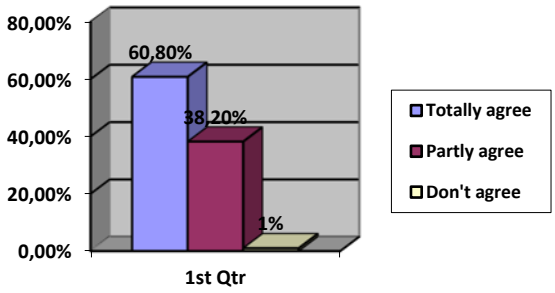
From the answers (Figure 13), it can be seen that the respondents mostly consider the importance of *Developing new skills* and *Acquiring competence in the workplace* as strategies for accessing effective career management. From this it can be concluded that the respondents believe that relying on themselves and investing in their own development of skills is the surest path to career development. It immediately follows the *image and reputation*

Manuscript received: 18.11.2022
Accepted: 24.11.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 42-53
Online: ISSN **2671-3810**
UDC: 005.966:334.722(497.7)
Original scientific paper
https://doi.org/10.46763/IJEMT2222042s

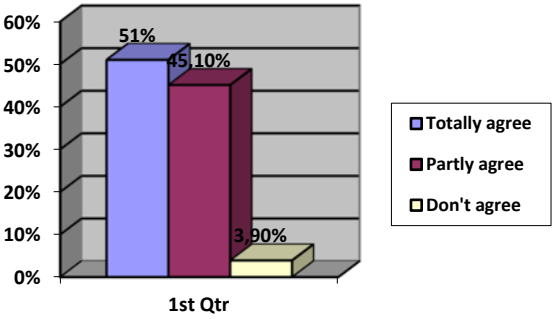
that the person will create in the environment. The lowest rated, i.e. strategy with the least importance for effective career management according to the respondents, is the involvement in the decision-making process in the organization and the development of its policies.
As for the effectiveness of the strategy and the influences that may call it into question, the respondents were offered two influencing factors as options: the organization itself (the norms and values that it nurtures) and the nature of the ultimate goal for which the strategy is intended. From the responses of the respondents that can be seen in Figure 14 and Figure 15, it can be concluded that the respondents agreed that the nature of the goal we strive for is significant and has an impact on the effectiveness of the strategy, but also the values and norms that are nurtured in organization have a high degree of influence on the success of the strategy.

Figure 14 - The effectiveness of the specific strategy depends on the norms and values of the organization.



Source: Own research

Figure 15 - The effectiveness of a particular strategy depends on the nature of the career goal



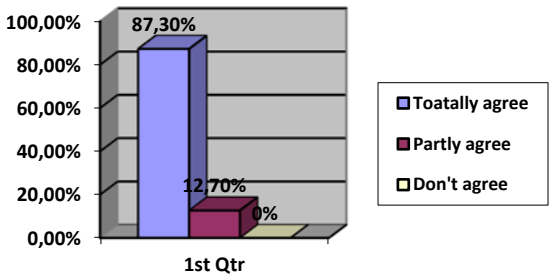
Source: Own research

The last question of the survey was aimed at determining the thinking and perception of the respondents about whether there is a universal way, a prescribed model that can equally successfully respond in all cases to defined goal.

Figure 16 - There is no "one best" strategy that is equally effective in all situations

Manuscript received: 18.11.2022
Accepted: 24.11.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 42-53
Online: ISSN **2671-3810**
UDC: 005.966:334.722(497.7)
Original scientific paper
https://doi.org/10.46763/IJEMT2222042s



Source: Own research

From the given answers, it can be concluded that the respondents clearly understand the essence of the strategic approach in solving problems. An overwhelming majority (87.3%) pointed to the fact that each strategy is specific to itself, built in accordance with the nature of the goal.

CONCLUDING REMARKS

Considering the importance of effective career management, the paper elaborates this issue in the Macedonian context. By determining the attitude of the respondents on several key issues related to effective career management, gaps in thinking and the possible lack of adequate knowledge in the area of career management should be revealed.

The results of the conducted research show that Macedonian citizens see career development as a continuous process that requires vision and long-term commitment. The conclusions are based on a sample composed of employees in both the public and private sectors (public 61.8%, private 38.2%), with experience mostly in domestic companies (90.2%), but also in foreign companies (9.8%), representation of both gender (male 19.6%, female 80.4%) and of course, the sample was predominantly composed of people in employment (99%) who face the challenge of developing their own career path.

What brought to the fore the result of the research was that the respondents have a clear idea of the need for an objective attitude towards oneself and one's environment. Over 70% of the respondents emphasized the importance of cultivating an honest attitude towards one's own needs and abilities, as well as their matching with the defined desires and goals. Because it is not enough to just want something strongly, but you also need the appropriate skills to achieve it. Very often, the possibilities for achieving the goals are limited by the conditions in the environment, so successful management of external factors is necessary, and for this purpose, their realistic assessment is needed. A third point that stands out with exceptional importance is that the defined goals must be realistic (78.4%) in order to be achievable. They should match the opportunities of the environment and also be compatible with the values, interests, abilities and lifestyle of the individual.

Over 75% of respondents have a clear idea that career management is a long-term, thoughtful and painstaking process that requires a strategic approach and a continuous supply of feedback that should provide us with insights as to whether we are on the right track and how far our actions are deviating from the defined goals. This kind of strategic approach necessitates the need for appropriate skills for strategy development as well as their implementation. 82.4% of respondents emphasized this fact. In the part of their free understanding of what, according to them, the strategy represents, most of the answers define

Manuscript received: 18.11.2022
Accepted: 24.11.2022
International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 42-53
Online: ISSN **2671-3810**
UDC: 005.966:334.722(497.7)
Original scientific paper
https://doi.org/10.46763/IJEMT2222042s

it as a continuous planned and organized process that requires persistence and commitment, aimed at a single goal/vision, the realization of which requires appropriate skills and constant upgrading of own knowledge.

Given the many opportunities that can provide career development in the form of different strategies, respondents emphasized the importance of having a strategy for developing new skills. 69.6% of respondents believe that the key to progress in one's career is to invest in the development of new knowledge and skills through continuous education. The second most important strategy, supported by 54.9%, is the acquisition of workplace competence, which is again related to the level of personal skills, abilities and investment in personal development. Options such as building one's own image and reputation (38.2%), developing new job opportunities (26.5%), finding a mentor and investing in additional working hours (14.7%) follow, and the lowest rated is the strategy for inclusion in the development of the organization's policies (9.8%).

We have already said that a career can be understood as a set of behaviors demonstrated by an individual for self-improvement, while entrepreneurship refers more to individual behavior aimed at promoting innovative and creative actions. (Ozsungur, 2021) However, individuals who see themselves in an entrepreneurial career should set their goals accordingly to reflect these entrepreneurial aspirations. Operational goals in the entrepreneurial career will reflect expectations for personal success, but also the achievements of the firm. In this case, personal career goals and business goals intersect. (Greenhaus et al., 2010)

Not every strategy is necessarily relevant to an entrepreneurial career. There are strategies that are almost unnecessary for an entrepreneur. However, a strategy that is considered relevant and necessary for every entrepreneur is definitely the strategy that includes the development of skills and knowledge (Greenhaus et al., 2010), because we said that for an idea to be transformed and implemented, appropriate knowledge, skills and talent are needed. Among other things, an entrepreneur is expected to possess characteristics of a researcher, organizer, etc. According to the respondents, exactly this strategy for developing new skills is of crucial importance and is ranked as a real priority regardless of the type of career in question.

Most respondents agree that the norms and values that are nurtured in the organization (60.8%) and the nature of the defined goal (51%) have an impact on effective career development. However, what is significant is the awareness that there is no unified model that guarantees results, but each career path requires its own commitment and a specific strategy specifically developed for the defined goal. 87.3% of respondents agreed that there is no "one best" strategy that is equally effective in all cases.

If we compare the answers, we will see that the so-called internal factors (abilities, skills, knowledge, self-assessment 76.5%) are far more pronounced than external factors (organizational culture as a factor 60.8%). Respondents gave greater importance to what personal skills, knowledge and abilities (as a condition for achieving career goals) represent, in contrast to the atmosphere in the organization as part of the opportunities/limitations that come from the environment. Part of the emphasized knowledge and skills refer to skills for strategy development and strategy management, supported by 82.4% of the respondents, quite expected if we consider that the need for strategic career development is strongly supported by 75.5% of respondents.

Manuscript received: 18.11.2022
Accepted: 24.11.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 42-53
Online: ISSN **2671-3810**
UDC: 005.966:334.722(497.7)
Original scientific paper
https://doi.org/10.46763/IJEMT2222042s

REFERENCES

1. Adamson, S.J., Doherty, N. and Viney, C. (1998) The meanings of career revisited: implications for theory and practice, British Journal of Management, Vol. 9, pp. 251-9.
2. Arnold, J. (1997). Managing careers into the 21st century. Paul Chapman, London.
3. Arnold, J. (2002). Careers and career management. In N. Anderson, D. S. Ones, H. K. Sinangil, & C. Viswesvaran (Eds.), *Handbook of industrial, work and organizational psychology, Vol. 2. Organizational psychology* (pp. 115–132). Sage Publications, Inc.
4. Ball, B. (1997). Career management competences – the individual perspective. Career Development International 2 (2): 74–79.
5. Dessler, Gary (2007). *Osnovi menadžmenta ljudskih resursa.* Beograd: Data Status.
6. Greco, L. M., & Kraimer, M. L. (2020). Goal-setting in the career management process: An identity theory perspective. *Journal of Applied Psychology, 105*(1), 40–57.
7. Greenhaus, J.H., Callanan, G.A., & Godshalk, V.M. (2018). Career Management for Life (5th ed.).
8. Greenhaus, J.H., Callanan, G.A., Godshalk, V.M., (2010). *Career Management.* Thousand Oaks. SAGE Publications, Inc.
9. Hirschi, A., Koen, J., (2021) Contemporary career orientations and career self-management: A review and integration, Journal of Vocational Behavior, 10.1016/j.jvb.2020.103505, 126, (103505).
10. Jayawarna, D., Jones, O., Macpherson, A., (2015). Becoming an entrepreneur: the unexplored role of childhood and adolescent human capital. In Rae, D., Wang, C.L. *Entrepreneurial Learning: New Perspectives in Research, Education and Practice* (pp.59-60). New York: Routledge
11. Mackowiak, John. (1985). *Career management: An active process*. American Journal of Hospital Pharmacy, Vol.42. p.554.
12. Ozsungur, F. (2021). A New Entrepreneurship Model for Digital Enterprises. In Sandhu, K., *Disruptive Technology and Digital Transformation for Business and Government* (pp. 43-45). Hershey: IGI Global
13. Scheiner, Ch.W. (2009). Fundamental Determinants of Entrepreneurial Behaviour. Wiesbaden.Gabler

Manuscript received: 22.11.2022
Accepted: 06.12.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 54-59
Online: ISSN **2671-3810**
UDC: 338.48-6:397.845]:338.48-6:663.2(497.7)
https://doi.org/10.46763/IJEMT2222054n

WINE TOURISM AS A FACTOR FOR THE DEVELOPMENT OF RURAL TOURISM

Marija Neskovic[1]
[1]*Second cycle student, Goce Delcev University of Stip, Faculty of tourism and business logistics*
**Corresponding author: neskovicm27@gmail.com*

Abstract
Wine roads are starting to develop and enrich the offer of rural tourism in the Republic of North Macedonia. Wine tourism is that part of tourism that includes visiting wineries, consuming wine, tasting cheeses, as one of the dishes that is characteristic and compatible with wine. Macedonia is a country with great potential for the development of this type of tourism. Some of the Macedonian wineries work intensively in this direction. The wineries in their offer include accommodation in their facilities in order to attract tourists who want to experience something different from this aspect. While staying in one of the suites at one of the wineries, almost every part related to winemaking is at your fingertips and you can fully understand the process of creating a new wine.

Key words: tradition, cultivation, history, cellars
JEL Classification: Tourism and Development

INTRODUCTION

Wine is the extract and essence of the grape, while the grape is the essence that comes from the soil where it sprouts. The ancients said "Tell me where you're from and I'll tell you what you're like, grapes carry within themselves the soil from which they sprouted and the climate under which they were grown. It unites the elements of nature with the strength, wisdom and spirit of the people who lived before us. Through wine we combine the past and the future, the tradition of the old masters in harmony with modern knowledge and technology, contributes to the development of rural tourism. Wine is one of people's favorite alcoholic beverages.Whether it is red or white wine, people really enjoy its taste and it is the most commonly consumed drink in all celebrations. The very thought of this delicate subject inspires respect, the play of numerous aromas and flavors, with the texture and structure of food and wine is extremely sophisticated. If we add here the subjectivity of the consumer's personal experiences and his current mood on the one hand, and the inspiration of the sommelier and chef on the other hand we get the "Fibonacci code" complicated or not, there are still some rules in this maze that we should generally adhere to.

Add the 30-century tradition of wine making, the hospitality of the locals and the delicacies of Macedonian traditional cuisine and you get one of the most interesting wine destinations in Eastern Europe, which can be seen by the increasing number of tourists interested in wine tourism. Today, wine tourism in Macedonia is experiencing a significant development, which can be seen through the increasing number of new private wine cellars that are enriching their activities in the direction of the development of local rural tourism. In addition to the increasing number of private wine cellars, wine tourism in Macedonia is being strategically developed at the state level through the development of wine routes, organizations, chambers and associations that aim to ensure the development of rural tourism in Macedonia on a global scale.

MATERIAL AND METHODS

1. Macedonia - the land of wine

1. History

Macedonia has a rich wine history. During the time of Philip the Second and Alexander the Great, the members of the Macedonian royal dynasty were known as great lovers of wine. This tradition continues during the time of the Roman Empire when Macedonia is one of the

Manuscript received: 22.11.2022
Accepted: 06.12.2022
International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 54-59
Online: ISSN **2671-3810**
UDC: 338.48-6:397.845]:338.48-6:663.2(497.7)
https://doi.org/10.46763/IJEMT2222054n

most important wine regions in the empire. Also, the great importance of wine is retained during the penetration of Christianity, when in almost all orthodox Christian ceremonies performed in churches, wine is part of the tradition. An example of this is the wedding ceremony where wine along with bread and salt is given to the bride and groom.

All these ceremonies are still present today and in this way the tradition of the meaning of wine is continued. Historical facts also say that wine played an important role during the reign of King Samuil, the Middle Ages and the end of the Turkish rule in Macedonia. Numerous archaeological finds have proven that the affinity towards growing wine grapes and wine production is one of the most important in Macedonian history. Today, Macedonia has 24,000 ha of vineyards that produce significant amounts of wine.

The intense aromas of Macedonian wines are the result of the combined influence of both Mediterranean and continental climates, with hot summer days and cooler nights. The extended ripening process of the grapes ensures the rich colors and complex aromas of the wine. Macedonia has vineyards with the famous modern French varieties of wine grapes, but also vineyards with native varieties of grapes, such as Vranec from the red ones, Žilavka and Temjanika from the white ones, and Stanushinata from the pink ones. Winemaking in Macedonia has a rich and varied potential like any other country, but this potential has only just begun to be exploited, even though the country has a long and significant history of wine production. 2. Wine regions

According to the climatic characteristics and classification of the EU, the Republic of Macedonia is considered as III-C-b zone for the cultivation of vines and has adopted the oenological rules that apply to this zone. A basic characteristic of this zone is that the wines can have acidification, but not enrichment, which corresponds to legislation and current practice of wine production in the country. There is one wine-growing region in Macedonia, which can be geographically divided into three regions:

1) Vardar valley, i.e. in the Central region (former Povardar wine region) - covers about 83% of the total production,
2) Western region (former Pelagonsko-Pologsko viticulture region) - covers 13% of the production and
3) The Eastern region (former Pchinjsko-Osogovo viticultural region), - covers about 4% of the total production.

3. Wine cellars
Today, Macedonia has 24,000 ha of vineyards that produce significant amounts of wine. The two most important indigenous grape varieties grown in Macedonia are Vranec (red) and Smederevka (white). In addition to these two most popular varieties, international varieties of wine grapes are grown, such as: Merlot, Cabernet Sauvignon and Pinot Noir from the reds and Chardonnay, Riesling and Sauvignon Blanc from the whites. In addition to these, other varieties of wine grapes are grown in Macedonia, such as Muscat Otonel, Semillion, Rkatsiteli, Grenache Blanc and Kadarka. Finally.

2. Wine tourism as an integral part of rural tourism
The analysis of the individual characteristics and the very term interpretation of rural tourism, eco-tourism, wine tourism, gastronomy as a tourism product, hunting tourism, fishing tourism, farm tourism, agricultural farm tourism, cultural tourism and religious tourism, indicate a common component. , and that is the development of activities in a rural environment. Wine tourism represents a new type of tourism with double benefits for both tourism and the rural area.

Manuscript received: 22.11.2022
Accepted: 06.12.2022
International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 54-59
Online: ISSN **2671-3810**
UDC: 338.48-6:397.845]:338.48-6:663.2(497.7)
https://doi.org/10.46763/IJEMT2222054n

The definition of rural tourism differs in different countries in Europe there is no single definition of rural tourism, rural tourism mainly refers to all services and activities offered in rural areas. Common key elements of rural tourism are:

- the rural area;
- preserved nature;
- accommodation in traditional village households;
- bed and breakfast with the possibility of independent food preparation;
- traditional rural gastronomy;
- communication with the hosts;
- getting to know and/or participating in agricultural activities, the tradition and way of living of the local population.

Through the development of wine tourism, rural areas can be regenerated, and on the other hand, economic progress and nature conservation can be achieved. According to the analyzes of the WTO (World Tourism Organization) and ETC (European Travel Commission), Europe as the number 1 tourist destination in the world shows a tendency to increase the number of tourists who use extended weekends as a way of rest from avoiding the stressful life in urban environments.

3. Wine tourism in rural areas in the Republic of North Macedonia

Macedonia as a country abounds with beauties and tastes that would attract every tourist. Unlike other famous wine regions, Macedonia is like an undiscovered treasure for every wine lover and anyone with an exploratory spirit, attracted by the long wine history and tradition and by the top wines in the rural areas. In addition to quality wines, untouched nature, ecological food and hospitality are the other things for which Macedonia is recognized in the world. Macedonia has an authentic history and tradition and of course that distinguishes us from other countries, but no less important are the local grape varieties from which top quality wines are produced.

4.Barovo wine camp as a factor for the development of rural tourism

Barovo wine camp is a unique tourist location that offers a stay in wine barrels in which Macedonian wine has been aged for decades. The wine camp captures the unity of time and place, the feeling of oneness with nature and with the history of a rural environment. Accommodation in a barrel is a fusion of untouched nature and endless vineyards, the tradition and culture of wine, local food and the unique taste of terroir created over centuries. The wine camp consists of 12 adapted barrels for accommodation, two shower rooms, a dressing room and a kitchen, all completely renovated from old barrels that aged Macedonian wine for more than 40 years. Each barrel is equipped with a bed and bedding, and electricity is provided for them through solar panels. The barrels are arranged in a way that allows each of them to have its own terrace with a chair to enjoy an unforgettable view of the sunrise and the unobstructed vineyards. Natural materials are used in Barovo Wine Camp, so mething that has a wine character and is authentic to the region, and complements the whole wine story that is told and passed on to tourists. It is considered that domestic tourists would be interested in weekend visits and replacing classic restaurants and already known destinations with such an extraordinary experience. While, foreign tourists would be more interested in rural tourism, sports, getting to know local landmarks and traditional ways of producing food and wine. If we consider tourism demand and the wants and needs of tourists, there are several different groups of visitors, whether domestic or foreign.

5. Popova Kula as a factor for the development of rural tourism

The natural beauties of the region make Popova Kula an ideal place for the development of rural tourism. In cooperation with experts, Popova Kula offers various activities in rural areas

Manuscript received: 22.11.2022
Accepted: 06.12.2022
International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 54-59
Online: ISSN **2671-3810**
UDC: 338.48-6:397.845]:338.48-6:663.2(497.7)
https://doi.org/10.46763/IJEMT2222054n

during your stay with them. Hotel "Popova Kula" offers 33 rooms, each named after the varieties of wine produced in Popova Kula and decorated in harmony with the colors and shades of the wine. All are equipped with: telephone and internet, air conditioning and satellite TV. Most of them also have a balcony with an amazing view of the beautiful surroundings – a real challenge for nature lovers. During their stay at the winery, guests can, if they wish, join a walk through the vineyards, grape picking, wine tasting, and a visit during wine production. By staying in the winery itself, they have the opportunity to enjoy the rural environment where the vineyards of the winery are located.

Doshnica River
A relaxing walk along the course of the beautiful r. Doshnica (with the possibility of a picnic lunch), Doshnica River is one of the cleanest rivers in Macedonia. From its source, which is located about 20 km south-southwest of Demir Kapija, under the highest peak of Kozhuf Mountain, all the way to Demir Kapija, there are no settlements or settlements. Before flowing into the r. Vardar near the Demirkapi Gorge, r. Doshnica passes through the lowlands of the Demirkapi valley hidden by the old forest that grows along its course.
Cycling - around the vineyards of Popova Kula
Rent a bike and take a tour around the vineyards, Length: 13.5 km; Altitude: start 178m, highest point 390 m.
Bird watching
Demirkapi Gorge is one of the richest ornithological reserves in Europe in terms of the presence of rare vulture birds. In cooperation with the local ornithological club, we offer bird watching tours with an expert guide.
Fortress Avg
A slightly more strenuous hike to the remains of the ancient fortress of Prosek, combined with moderate walking and easy walking on the way back. This tour is intended for people who are ready for slightly more difficult physical activities. The Prosek fortress was a strategic place, located on the stone hill on the left side of the Demirkapi Gorge. The view from this place is spectacular!
Klisura village
Easy to moderately difficult hike to the abandoned village of Klisura, the village of Klisura is located south of Demir Kapija, just behind the Krastavec hill this is the oldest village within the Demir Kapija municipality. Enjoy the beautiful peaceful nature surrounded by mountains with the opportunity to visit the church and the monastery in the village. The village of Klisura is also a great place for bird watching.
The Lost World - Radnja Village
Deep in Kozuf Mountain, a forbidden place for Turks during the Ottoman Empire, lies the land of the free - the village of Radnja,the village was established in the early days of the Ottoman Empire. It was completely destroyed during the Second World War and is therefore abandoned today. Today, one true story of a lost world remains.
Tikvesh Valley - wine tasting tours
Although there are more than 80 wineries in Macedonia, most of the grapes and wine are found in Tikveštia, and therefore most of the wineries are found right here. All wineries are located within a radius of 30 km from Popova Kula, which allows an easy and quick visit to those that are open to tourists.

Chelavec village
A moderately strenuous hiking tour along the Juruchka River to the village of Chelavec,spectacular starting point - between the two tunnels in the Demirkapi Gorge, and then continue to the small but beautiful gorge of Juruchka Reka.

Hot springs on the r. Doshnica true hidden treasure for tourists - refresh yourself and merge with nature. Before the very entrance of r. Flowing into the Demirkapi valley, the river has

Manuscript received: 22.11.2022
Accepted: 06.12.2022
International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 54-59
Online: ISSN **2671-3810**
UDC: 338.48-6:397.845]:338.48-6:663.2(497.7)
https://doi.org/10.46763/IJEMT2222054n

formed natural whirlpools suitable for refreshment. The water in the whirlpools in summer is warmed by the sun, but also by the accumulated heat from the rocks that surround them.

Cooking lessons for traditional Macedonian dishes
One of the things that you should definitely do when you are visiting Macedonia is to try the local food. It will also be an unforgettable experience to try to learn to prepare your favorite Macedonian traditional meal. We offer you this unforgettable experience.

Traditional dance and dance classes
Macedonia has a rich musical and folklore heritage. While you are here it would be an unforgettable experience to get to know some of this cultural treasure better. We provide you with exactly this.

Rock climbing
Demirkapi Gorge is one of the best places in the world for rock climbing. This place is the choice of professional climbers from all over the world. However, it is also a perfect place for beginners or enthusiasts.

RESULTS AND DISCUSSION

Changes in tourism candidates, those among young people, who according to the World Tourism Organization (UNWITO) set their life values and prefer to spend those who are directly money in rural areas, the community knows that tourism the introduction of new products or services in the wine industry is not a key to opening the door to an innovative offer, but it is the result of which today the tourist offer should be created and the rurliminalism should be developed.

In the wine camp Barovo and Popova Kula you have a unique opportunity to experience the complete wine story and rural environment. Not only to taste the wines, but to directly discover and reveal to you the knowledge of the cultivation of the vine and its production that begins in the vineyard itself.

CONCLUDING REMARKS

Wine tourism represents a new type of tourism with dual use for both tourism and rural areas. Mainly under rural tourism are defined all services and activities that are offered in rural areas. Through the development of wine tourism, rural areas can be regenerated, on the other hand progress and nature conservation can be achieved. Unlike other famous wine regions, Macedonia is like an undiscovered treasure for every wine lover and anyone with an inquisitive nature, attracted by the great wine history and tradition and by the top spirits in the rural areas. In addition to quality wines, untouched nature, ecological food and hospitality are the other things for which Macedonia is recognized in the world. Macedonia has an authentic history and tradition and they are no different from other countries, but they are no less important and are grapes from which top quality wines are produced. It is a significant difference and a sufficient reason for the promotion of the uniqueness of our country in relation to the wine tourism offer and therefore also the reasons for rural tourism.

REFERENCES

1. Ivanova-Petropoulos, V. (2013), Sensory and Analytical Evaluation of Wine. Stip: UDG;
2. Indesign studio (2011), Guide to Macedonian wineries. Skopje: Indesign studio;
3. Metodijeski, D., Filiposki, O., Todorovic, E., Taleska, M., Michev, G., Dimovski, Ch. (2019), Guide to wine tourism in the Republic of North Macedonia. Skopje: Ministry of Economy;

Manuscript received: 22.11.2022
Accepted: 06.12.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 54-59
Online: ISSN **2671-3810**
UDC: 338.48-6:397.845]:338.48-6:663.2(497.7)
https://doi.org/10.46763/IJEMT2222054n

4. Natsev, T. (2016), Wine Regions in the Province of Macedonia II. Yearbook of the Association for Anthropology, Ethnology and Folklore "Ongle",
5. Tashkov, N., Veljanov, T. (2011), Service Technology. Stip: UDG;
6. The Environmental and Social Aspects Management Plan, Development of Wine and Gastronomic Tourism – Taste Macedonia Skopje, 2019
7. Ivanova, S., Dimitrov, D. (2017), Applying wine culture
8. restaurant. Journal of Mountain Agriculture in the Balkans, 20 (4)
9. vanova, K. (2012), Sommeliership. Varna: IU Science and Economics;
10. Josefina, WINE CULTURE, TERRITORY/LANDSCAPE AND TOURISM, A KEY PILLAR OF WINE TOURISM, http://193.136.79.105:8080/bitstream/
11. Popova Tower http://www.popovakula.com.mk/

Manuscript received: 24.11.2022
Accepted: 06.12.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 60-66
Online: ISSN **2671-3810**
UDC: 336.748.12:336.781.5]:303.725.3(497.7)
Original scientific paper
https://doi.org/10.46763/IJEMT2222060mg

RISING INTEREST RATES REDUCE INFLATION: AN EMPIRICAL STUDY FOR THE REPUBLIC OF NORTH MACEDONIA

PhD. Milica Milosheska Gavrovska[1]
[1]Komercijalna banka AD, Skopje, Republic of North Macedonia,
e-mail: milica_miloseska@yahoo.com

Abstract
This article aims to help us understand what rising inflation will mean in this low interest rate environment. This paper analyzes the current developments with growing inflation and makes a theoretical and empirical analysis of the interactions between interest rates and inflation in North Macedonia.

In the theoretical part, the review of the literature revealed that some of the researchers established a unidirectional relationship between the inflation and the interest rate, and some a bidirectional relationship. In the empirical analysis, the daily data of the Central Bank od the Republic of North Macedonia for inflation and interest rates for the period 2006:01 – 2022:06 were used.

Granger Causality Test was used to determine the relationship and its direction in the short term through VECM. As a result of the analysis, bilateral causality among variables was determined in the short term. In other words, inflation is a cause of interest rate and interest rate is a cause of inflation. An increase in interest rates reduces inflation. But, the main problem with using interest rates to control inflation are lags, because take time to affect inflation trends. Yet the NBRSM's adherence to its inflation target can only be gauged with backward-looking inflation statistics. But, at this point, no one really knows how high interest rates might need to climb in order to get inflation back down without creating too much additional unemployment.

The findings have practical policy implications for decision makers in the area of macroeconomic planning, particularly in North Macedonia.

Keywords: *Inflation, İnterest rates, Cointegration, Monetary policy.*
JEL Classification: E31, E43, C12, C22

INTRODUCTION

After a long period of relatively low inflation, consumer prices are skyrocketing. The global economy is facing rising prices of primary products on world markets and disruptions in supply chains, which also affect other types of products. These problems have increased production costs in all parts of the world. The war in Ukraine and the West's economic sanctions against Russia have intensified the existing inflation. The inflation is very high and has the potential to continue rising unless policymakers take more aggressive measures. Policymakers face the challenge of stemming inflation without compounding the economic slowdown resulting from the war in Ukraine and related sanctions.
The main task of central banks is to prevent inflation from spiraling out of control - and to bring it back down to the desired pace of around 2%. But I believe this is the most difficult task facing central banks in general.
Prices in North Macedonia, on average, rose by about 7%, in the European Union by about 5.5%, and in the United States, on average, prices rose by about 7.5% (which is the fastest rate of inflation in the United States since 1982). An additional problem and threat for the European Union is now the political crisis (governmental and parliamentary) in Italy.

Manuscript received: 24.11.2022
Accepted: 06.12.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 60-66
Online: ISSN **2671-3810**
UDC: 336.748.12:336.781.5]:303.725.3(497.7)
Original scientific paper
https://doi.org/10.46763/IJEMT2222060mg

According to a Pew Research Center analysis (DeSilver, 2022), inflation rates have doubled in 37 of 44 advanced economies over the past two years. High inflation is a big challenge for everyone.

Since the global financial crisis of 2007-2009, interest rates in Europe have remained at almost zero levels (some even negative), and in the Macedonian economy they have been continuously declining. But the current events caused changes in the situation and the final tightening of the monetary policy by the central banks, which heralded the end of low interest rates. Rising interest rates reduce inflation. Central banks have already started to actively increase interest rates in response to the situation, and they are also announcing a new additional increase in interest rates. The Bank of England, FED, ECB, have already done that.

The Federal Reserve has several main goals regarding the economy: to promote maximum employment, to keep prices stable, and to ensure moderate long-term interest rates. The Fed's main tool for dealing with inflation is interest rates. “The Fed uses interest rates as either a gas pedal or a brake on the economy when needed. With inflation running high, they can raise interest rates and use that to pump the brakes on the economy in an effort to get inflation under control.” said Greg McBride, a chief financial analyst at Bankrate (Reinicke, 2022). To do that, the Fed has signaled it plans to raise interest rates several times this year — perhaps as many as five — starting in March. And faster-than-expected inflation numbers in January suggest it may need to accelerate its overall timetable. However, Sinclair (Reinicke, 2022) alerts that “They have to carefully walk that tightrope”.

The European Central Bank raised interest rates for the first time in more than 11 years, trying to control rising inflation in the Eurozone. The key interest rate has been negative since 2014 in order to encourage banks to borrow money and circulate the money instead of depositing it with the ECB. The ECB has twice increased interest rates by 0.5 percentage points (the last time on 21.07.2022), and is planning a further increase.

The National Bank of North Macedonia continued with the gradual normalization of the monetary policy to maintain medium-term price stability, through a further increase in the basic interest rate (the interest rate on Central Bank bills increased to the level of 2.5% as of July 2022).

However, the fact is that despite the increase, they will remain very low by historical standards and well below the rate of inflation. „This 2022, it is going to be a tough year.“ said Kristalina Georgieva, managing director at International Monetary Fund (Pomeroy, 2022).

The structure of the paper is as follows: section 2 reviews theoretical basics of interest rate and inflation rate relationship. Section 3 discussed about interest rates and inflation. In section 4, the data and methodology are presented. Section 5 devotes on discussion of the empirical results. Finally, Section 6 presents concluding remarks.

LITERATURE REVIEW

Interest rates have played a central role in macroeconomic policy. They have also enjoyed high popularity as policy instruments in developing countries. For instance, high interest rate has been an essential component of many stabilization programs in countries with chronic inflation during the 1980s. One of the basic macroeconomic variables related with interest rate is inflation rate.

Various studies on the relationship between interest rate and inflation have evolved over time in the literature. Some of these studies are theoretically based while some are empirical. The Fisher hypothesis (Fisher, 1930) suggests that inflation is the main determinant of interest

Manuscript received: 24.11.2022
Accepted: 06.12.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 60-66
Online: ISSN **2671-3810**
UDC: 336.748.12:336.781.5]:303.725.3(497.7)
Original scientific paper
https://doi.org/10.46763/IJEMT2222060mg

rates, and as the inflation rate increases by one percent, the interest rate increases by the same amount (Amaefula, 2016). A relationship between inflation and the interest rate has been established using the Fisher effect as a framework (Fama, 1975,1982; Mishkin, 1992).

Based on theoretic issues and empirical studies, there is bidirectional causality relationship between interest rate and inflation rate (Çiğdem, 2019). Of course, some studies have rejected a strong bidirectional relationship between two-mentioned variables (Asgharpur et al., 2007). Brzezina (2001); and Fave and Auray (2002) have confirmed a relationship between interest rate and inflation rate in the long-run.
So, based on these issues, it is expected that a bidirectional causal relationship will exist.

ANALYSIS OF THE CURRENT SITUATION WITH INTEREST RATES AND INFLATION

The volatility of the financial markets remains high. Inflation continues to surprise on the upside. Policymakers face difficulty in predicting supply shocks. At the same time, energy and food shocks appear to be more persistent than previously thought and not just a consequence of the war in Ukraine, as inflation gained momentum before the outbreak of the conflict. Inflation rates for services and non-energy industrial goods also surprised to the upside, and none of the increases in core inflation each month so far this year were forecast.

In the period January - June 2022, the annual inflation rate in North Macedonia is 10%, on average, which is more than projected. The largest part of the domestic inflation is the result of the pressure from the import prices of food and energy, which so far are growing stronger than expected. These pressures quickly spill over to the prices of other products and services and further fuel inflationary expectations (NBRNM, 2022). Core inflation in Macedonia in June reached 12.30% (May 10.2%), and headline inflation 14.50% (May 11.9%). The conditions in the European Union and the United States are moving in the same direction. The core inflation in the European Union in June reached 4.59% (May 4.51%), and the headline inflation 9.60% (May 8.80%). Core inflation in the USA in June reached 5.9% (May 6.0%), and headline inflation reached 9.0% (May 8.50%). This is shown at Fig.1 and indicates that price pressures are expanding and becoming more persistent.

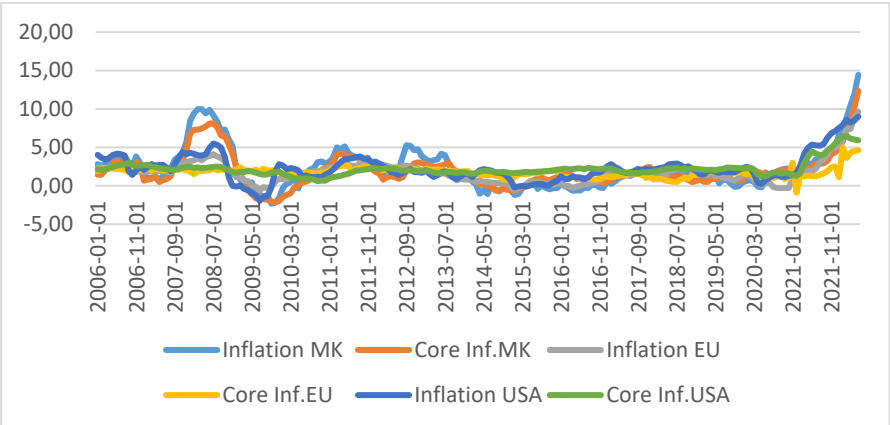


Figure 1. Headline and Core inflation, monthly: RN Macedonia, EU and USA
Source: State Statistical Office of the Republic of North Macedonia, ECB and FED Financial Statistics; Created by the Author

The problem is that any "all-items" CPI will often exaggerate the underlying trend in inflation, usually dominated by extreme changes in global energy and food prices. This can make apparent inflation over the past 12 months dangerously misleading as a guide to future policy for the next 12 months. Core inflation usually captures more persistent components of inflation

Manuscript received: 24.11.2022
Accepted: 06.12.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 60-66
Online: ISSN **2671-3810**
UDC: 336.748.12:336.781.5]:303.725.3(497.7)
Original scientific paper
https://doi.org/10.46763/IJEMT2222060mg

relevant to medium-term trends. Hence, understanding "core inflation" has rarely been so important.

Core inflation is the change in the costs of goods and services, but it does not include those from the food and energy sectors. This measure of inflation excludes these items because their prices are much more volatile. In the Macedonian economy is calculated using the consumer price index (CPI), which is a measure of prices for goods and services. Core inflation is a good indicator of current and future trends in inflation, and hence a viable target for monetary policy. The historically high level of core inflation pointed to increased risks of higher inflation becoming more entrenched and more permanent. Gasmain pressures are also seen to continue to rise, increasing the chances of a stronger and faster pass-through to consumer prices.

DATA AND METHODOLOGY

The basic model of interest rate as a function of inflation rate *(x)* is presented at Eq. (1):

$$y_t=f(x_t) \quad (1)$$

All variables are in percentages; and data have gathered from the State Statistics Office and the National Bank of the Republic of North Macedonia between the period of January 2005 and June 2022. The time span allows us to use 222 observations in our time analysis. For all calculations the statistical software EVIEWS is used. The data are graphically shown at Fig.2:

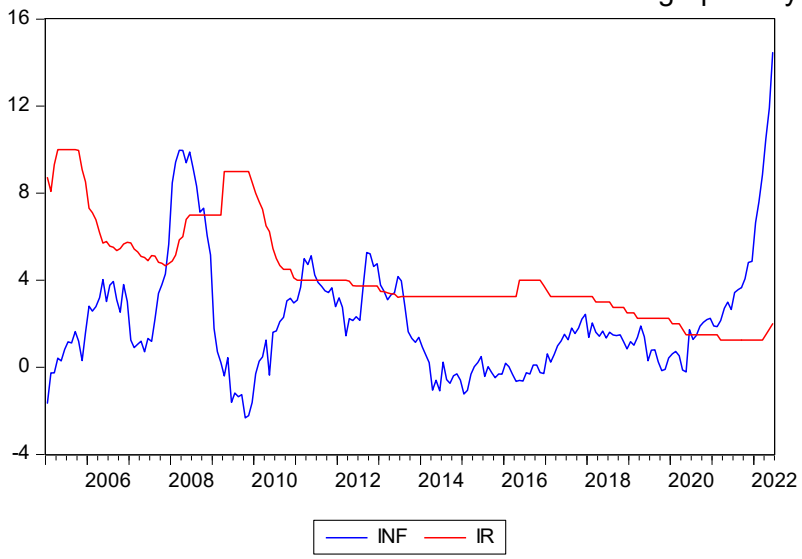


Figure 2. Inflation and Interest rate in Macedonia, 2006:01-2022:06
Source: Created by the Author

Firstly, in order to understand the stationarity (or the order of integration) of considered variables, a standard Unit root test was performed. More specifically, unit root analyses of PP (Phillips - Perron) developed by Phillips and Perron (1988) and ADF (Augmented Dickey - Fuller) developed by Dickey and Fuller (1979, 1981) were used. Equation (2) and equation (3) functionally represent the PP unit root analysis and ADF test, respectively;

$$\Delta y_t = ß+\delta y_t + \sum_{i=1}\emptyset i\ \Delta y_{t-1} + \varepsilon_t \quad (2)$$

$$y_t=\beta_0+\delta_1 y_{t-1}+\varepsilon_t \quad (3)$$

In these equations, the observation number was formulated with T, the distribution of the errorterms with ε_t, the series where the test is applied with y_t and the trend variable with *α, β* and*t*. Hypothesis is as

Manuscript received: 24.11.2022
Accepted: 06.12.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 60-66
Online: ISSN **2671-3810**
UDC: 336.748.12:336.781.5]:303.725.3(497.7)
Original scientific paper
https://doi.org/10.46763/IJEMT2222060mg

H_0 : Series is not stationary (there is a unit root in the series)
H_1 : Series is stationary (there is no unit root in the series)

Secondly, as a result of the unit root analysis, after it was deteced that the variables were stationary at the same level (I_1), Johansen Cointegration test was performed to test whether the series cointegrated in the long term. Following the cointegration detection, Granger Causality Analysis was applied to the series through VECM (Vector Error Correction Model) with an aim to question the causality relationship and direction of the causality in the long term.

The standard Granger causality test is based on the prediction of the two-variable VAR model given at Eq. (4):

$$\Delta y_t = \beta_0 + \sum^{n}_{i=1} \beta_{1i} y_{t-1} + \sum^{n}_{i=1} \beta_{2i} x_{t-1} + \varepsilon_t \quad (4)$$

Engle and Granger (1987) stated that the standard Granger test based on the VAR model would not be acceptable when the series were cointegrated and in this case, the causality relationships between the series needed to be examined with the vector error correction model (VECM). In this case, the VECM is established to explaining the short and long-term causality relationships. The VECM model is specified in the following Eq. (5):

$$\Delta y_t = \beta_0 + \sum^{n}_{i=1} \beta_{1i} y_{t-1} + \sum^{n}_{i=1} \beta_{2i} x_{t-1} + \beta_3 EC_{t-1} + \varepsilon_t \quad (5)$$

where, $y_t$represents the dependent variable, x_t represents the independent variable, *ECt-1* is the error-correction term, and ε_t is the standard error. In the VECM model it is estimated that all variables are endogenous, the impact can be calculated through the selection of dependent and independent variables.

EMPIRICAL RESULTS AND DISCUSSION

In this section, firstly, the unit root analysis results of the variables included in the analysis and then cointegration test results will be discussed. The results of the analysis where the stationariness of the series were tested are given in Table1. According to the ADF and PP unit root results, variables are stationary at I_1.

Table1. Unit root test (PP and ADF): inf, ir

Variable	Phillips Perron Test						
	At level		1st difference		2nd difference		Conclusion
	Adj.t-stat.	p-value	Adj.t-stat.	p-value	Adj.t-stat.	p-value	
Inf	-1.553447	0.5046	-12.62733	0.0000	-54.56348	0.0001	I (1)
Ir	-1.887997	0.3376	-11.42120	0.0000	-39.00874	0.0001	I (1)
	Augmented Dickey - Fuller						
Inf	0.114622	0.9661	-6.196393	0.0000	-4.906303	0.0001	I (1)
Ir	-2.61844	0.0908	-7.025479	0.0000	-12.55855	0.0000	I (1)

*significant at 10% level of significance p<0.10; ** significant at 5% level of significance p<0.05; *** significant at 1% level of significance p<0.01; Decision:Reject the null hypothesis of unit root at 5% level of significance.With the results thus obtained, Johansen's cointegration technique can be implemented and the VECM model can be applied. But before calculating the long-run coefficients of the basic VAR model, it is necessary to determine the optimal

Manuscript received: 24.11.2022
Accepted: 06.12.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 60-66
Online: ISSN **2671-3810**
UDC: 336.748.12:336.781.5]:303.725.3(497.7)
Original scientific paper
https://doi.org/10.46763/IJEMT2222060mg

number of lags. We determine the optimal lag length by minimizing the Schwarz (1978) Bayesian Information Criteria (SC). The lower the SC value, the better the model. In our case, the optimal length of the delay has been calculated and is 3. Then, with Johansen Cointegration test, Table 2, it is stated that the statistical value is smaller than the critical values; the inflation and interest rate series are cointegrated in the long term.

Table 2. Johansen Cointegration test

Variables	Trace	Max-Eigen	Lag
Inf – ir	22.49180***	19.99502***	3

*significant at 10% level of significance p<0.10; ** significant at 5% level of significance p<0.05; *** significant at 1% level of significance p<0.01; Trace represents the Trace Test statistics and Eigenvalue is the Maximal Eigenvalue Test statistics.

Table 3. Granger Causality Test Results through VECM

Hipothesys	Prob	Direction od Causality
Inf is a Granger cause odIr	0.0085***	Inf → Ir
Ir is a Granger cause of Inf	0.0013***	Ir → Inf

**Note: significant at 1% level of significance p<0.01*

Table 3 shows the Granger Causality Test results through the VECM model and the directionof the relationship determined in the short term; accordingly, there is a *bilateral causality* between the variables. It means that inflation is a Granger cause of interest rates and interestrates are a Granger cause of inflation.

CONCLUSION

Global inflation has rebounded from last year's lows faster and sooner than after any previous global recession in the past five decades. At the same time, this is the highest inflation in the recent history of the Macedonian economy. Current developments prompted the idea of examining the relationship between inflation and interest rates through the case of North Macedonia The Granger Causality Test through the VECM model, indicates a bilateral causality between the variables in the Republic of North Macedonia. Interest rates tend to move in the same direction as inflation but with lags, because interest rates are the primary tool used by central banks to manage inflation. In general, higher interest rates are a policy response to rising inflation. And this was the response of policymakers in most countries around the world in response to current developments. But it is important that policy changes take time to affect inflation.

If the high inflation in the Macedonian economy is mainly due to the previously mentioned higher production costs and low inventories, then the Central Bank will have to continue raising interest rates to a large extent, causing commercial banks to tighten lending conditions (because up to this point most of the banks did not respond to the market signals), and thus it will significantly reduce the demand to slow down the pace of inflation. Importantly, the bigger the Central Bank raises rates, the more damaging it will be for the economy. That is the main risk of raising interest rates too quickly. Hence the uncertainty about the degree and pace of monetary policy adjustment needed to restore price stability in the medium term.

Manuscript received: 24.11.2022
Accepted: 06.12.2022

International Journal of Economics, Management and Tourism
Vol. 2, No. 2, pp. 60-66
Online: ISSN **2671-3810**
UDC: 336.748.12:336.781.5]:303.725.3(497.7)
Original scientific paper
https://doi.org/10.46763/IJEMT2222060mg

REFERENCES

Amaefula, C.G. (2016). Long-Run Relationship between Interest Rate and Inflation: Evidence from Nigeria. *Journal of Economics and Finance* (IOSR-JEF) e-ISSN: 2321-5933, p-ISSN: 2321-5925.Volume 7, Issue 3. Ver. I, pp. 24-28

Asgharpur, H., Kohnehshahri, L. A., & Karami, A. (2007). The Relationships Between Interest Rates and Inflation Changes: An Analysis of Long-Term Interest Rate Dynamics in Developing Countries. Tehran: Iran Economic Research Center. https://www.researchgate.net/publication/267384862 (accessed 01.07.2022)

Brzezina, M.B. (2001). The relationship between real rate interest rate and inflation. Research department, National Bank of Poland and Chair of Monetary Policy

Çiğdem, G. (2019). A Paradox: An Empiric Approach to Inflation-Interest Rates Relationship: Evidence from Turkey. *Macrothink Institute journal*, ISSN 1948-5433, Vol. 11, No. 3

DeSilver, D. (2022). Research from 44 countries shows levels of rising inflation across the world. Pew Research Center Articles. https://www.pewresearch.org/fact-tank/2022/06/15/in-the-u-s-and-around-the-world-inflation-is-high-and-getting-higher/ (accessed 15.06.2022)

Dickey, D. A., & Fuller W. A. (1979). Distribution of the Estimators for Eutoregressive Series with a Unit Root. *Journal of the American Statistical Association*, Vol.74, pp.427-431

Dickey, D., & Fuller, W. A. (1981). Likelihood Ratio Statistics for Autoregressive Time Series with a Unit Root. *Econometrica*, Vol.49, pp.1057-1072

ECB, Statistical Data Warehouse. https://sdw.ecb.europa.eu/ (accessed 12.07.2022)

Engle, R. F., & Granger, C. W. J. (1987). Co-Integration and Error Correction: Representation, Estimation, and Testing. *Econometrica*, Vol.55(2), pp.251-276

Fama, E. (1975). Short term interest rate as predictor of inflation. *American Economic Review*, Vol.65, pp.269-282

Fama, E. & Gibbons, M. (1982). Inflation, real returns and capital investment. *Journal of monetary Economics*, Vol.9, pp.297-323

Fave, P. &Auray, S. (2002). Interest rate and inflation in Monetary models with ingenious money growth rate. *Economic Bulletin*, 5(1), pp. 1-10

FED, Statistical Data. https://www.federalreserve.gov/data.htm (accessed 12.07.2022)

Fisher, I. (1930). *The Theory of Interest*. New York: Macmillan.

Mishkin, F. S. (1992). Is the Fisher effect for real?.*Journal of Monetary Economics*, Vol.30, pp.195-215

NBRNM (2022). The base interest rate increased to 2,50%. https://www.nbrm.mk/ns-newsarticle-soopstenie-13072022.nspx (accessed 13.07.2022)

NBRNM, Statistical Data. https://www.nbrm.mk/statistika.nspx (accessed 12.07.2022)

Phillips, P. C., &Perron, P. (1988). Testing For A Unit Root in Time Series Regression. *Biometrika*, Vol.75(2), pp.335-346

Pomeroy, R. (2022). What's next for the global economy? Experts talk inflation, stagnation and (de-)globalisation at Davos 2022. World Economic Forum Annual Meeting, Article. https://www.weforum.org/agenda/2022/06/davos-2022-global-economic-outlook (accessed 10.06.2022)

Reinicke, C. (2022). The Federal Reserve just hiked interest rates by 0.75 percentage point. How raising rates may help slow inflation. CNBC Articles. https://www.cnbc.com/2022/06/15/federal-reserve-interest-rate-hike-how-raising-rates-slows-inflation.html (accessed 15.06.2022)

Schwarz, G. (1978). Estimating the dimension of a model. *The annals of statistics*, Vol.6 (2), pp.461-464.

State Statistical Office of the Republic of North Macedonia. http://makstat.stat.gov.mk/PXWeb/pxweb/mk/MakStat/MakStat__Ceni__IndeksTrosZivot (accessed 12.07.2022)