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ENTREPRENEURSHIP WITH FINANCIAL AND UNEMPLOYMENT FRICTIONS

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Abstract

Financial frictions for capital and unemployment frictions for labor is said to be main drivers of the business cycle dynamics.Large literature in general equilibrium models of entrepreneurship exists whereby financial frictions play major role in the underlying incentives and motives to trade. In these models entrepreneur wealth shock has different effect on the baseline (frictionless) economy and the economy with financial and unemployment frictions.Entrepreneurs are iintroduced in the models and they posses different abilities (measured by low,medium,high productivity) which in turn affects aggregate savings and aggregate wealth of the economies.In these models financial frictions are introduced following assumption that working capital loans are frictionless. Each entrepreneur faces probability of exit from economy (bankruptcy probability) which is identical for all entrepreneurs in the economy. In the endogenous entrepreneurship and financial frictions model it is shown that occupation choice is different for worker or entrepreneur based on productivity: low (worker) or high (entrepreneur) which in turn affects the aggregate wealth of the economy. Also, in this model it is shown that interest rate in the economy is determined by the intersection of total wealth with public and private capital.

Key words: financial frictions, employment frictions, entrepreneurship, business cycles
JEL Classification: E00,E30,G00,J64

Introduction

Financial crisis from 2008 has made it clear that business cycles modeling can no longer abstract itself from financial factors that appear *prima facie* to be main mechanism of the economic downturn (see Christiano et al. (2011)). Entrepreneurs developers of private firms are central actors in modern economies, and the anemic growth of firms and their plants is one of the unfortunate features of the underdeveloped economies (see, Hsieh,Klenow (2014), Buera et al.(2015)).Poor countries also have low levels of financial development. With lesser access to financial services, such as savings accounts and bank loans, and measures of externa; finance to GDP that can be of order of magnitude smaller than those of advanced economies (see Banerjee, Duflo (2005), King , Levine (1993)).One particular and common explanation of low performance of entrepreneurs in developing countries is their inability to obtain credit to expand their scale of operation. This literature shows that wealth of entrepreneurs is highly undiversified, suggesting limits to the feasibility of external financing. Some forms of contractual frictions or borrowing constraints must be at work to explain why entrepreneurs take so much risk, (see Quadrini (2009)). Several studies in macroeconomics have extended the basic model of precautionary savings, (see Carroll (1997)[1], Huggett (1993),

[1] This is a significant body of literature whose goal is to understand the differential saving behavior between rich and poor households.

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Aiyagari (1994)) to incorporate entrepreneurs. These studies are quantitative in nature and they all share the following features: first the choice to become an entrepreneur is endogenous, second feature is that entrepreneurs generate income with the input of capital, and third external financing is limited due to some form of financial frictions.There is a list of papers that share some of the issues before mentioned: Akyol,Athreya (2007), Bohacek (2006), Buera (2007), Cagetti ,DeNardi (2004,2006), Li (2000), Meh (2005), Meh,Terajima (2007), Quadrini (2000),Terajima (2006).Entrepreneurship models can also study more specific policies such as subsidies and taxes. Examples of previous are such as: Cagetti ,DeNardi (2004), Kitao (2008), Li (2000), Meh (2005). Another issue investigated in these models is whether financial imperfections have positive or negative effect on aggregate accumulation of capital, and in the representative model with uninsurable idiosyncratic risks to earnings, market incompleteness leads to higher accumulation of capital. About the incomplete markets we know that Storesletten et al. (2001) showed that liquidity-constrained households are hit particularly hard by aggregate productivity shocks. Arrow (1951) and Arrow,Debreu (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. Newer literature includes :Guntin,Kochen(2022), that relates to the literature of financial frictions and misallocation as a source of low total factor productivity see also Hsieh , Klenow, (2009) Buera, Kaboski, Shin, (2011); Midrigan ,Xu, (2014).These models have also been used to analyze business cycle fluctuation, particularly in the aftermath od the great depression or 2008 financial crisis (see Achdou et al.(2014), Bassetto et al. (2013), Buera ,Moll (2012), Buera et al. (2014), Kiyotaki , Moore (2012), Shourideh,Zetlin-Jones(2014), with entrepreneurs playing an important role relative to corporations because of the interaction of consumption, saving, and risk that is linked with investment.In the unemployment section of this research Diamond-Mortensen-Pissarides framework (DMP model)[2] has been used. Important standard textbook in macroeconomics use DMP framework these include: Carlin ,Soskice (2006); Williamson (2013); Chugh (2015)[3].DMP model has been accepted throughout macroeconomics in the economics of business cycles, Merz (1995) ;Andolfatto (1996), in the New Keynesian model, see Gertler, Trigari (2009),in the area of monetary policy, see Blanchard and Gali (2010);and in the field of endogenous disasters, Petrosky-Nadeau, Zhang, and Kuehn (2015) ,see Petrosky-Nadeau, Zhang(2017).As per Hall (2012), DMP model is a central component of modern macroeconomics. Model by Christiano et al. (2011) implements financial frictions in the accumulation and management of capital similar to Bernanke et al. (1999) and Christiano et al. (2003, 2008). The financial frictions that are introduced in the paper by Christiano et al. (2011) show that borrowers and lenders are different agents, and that they have different information. Thus, they introduce “entrepreneurs”. These agents own and manage the capital stock, financed both by internal and borrowed funds. Only the entrepreneurs costlessly observe their own idiosyncratic productivity. The presence of asymmetric information in financing the capital stock leads to a role for the balance sheets of entrepreneurs. So, this paper is structured in the following way: First the processes used in the MATLAB,DYNARE and PYTHON will be explained namely Ornstein-Uhlenbeck process, Hamilton-Jacobi-Bellman equation, Finite difference method, and Euler equation. After these, three examples will be used to show effects financial frictions,

[2] Even before this paper large literature existed on job rationing and matching frictions .Models of job ration include efficiency wage models, Solow (1979), gift-exchange model Akerlof (1982), insider-outsider models such as Lindbeck ; Snower (1988),and social norm models Akerlof (1980).

[3] Also wage-setting frictions have an impact on the effort of an employer in recruiting new employees. Accordingly, the setup is not vulnerable to the Barro (1977) critique that wages cannot be allocational in ongoing employer–employee relationships (see Hall, (2005))

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and unemployment frictions (with entrepreneurs) on the economy. Codes used in those parts are written by: Frederic Martenet (PYTHON model)[4], Christiano et al. (2011) a Dynare code [5],and MATLAB code example by Benjamin Moll[6] based on Achdou et.al (2014).In the end we will draw conclusion on models of entrepreneurship with financial and unemployment frictions.

Ornstein–Uhlenbeck process

The Ornstein–Uhlenbeck [7]process x_t is defined as follows:

equation 1

$$dx = \mu F dt + \sqrt{2D}dW$$

Where x drifts with velocity μF, combining drift with an unbiased random walk with average step size$\sqrt{2Ddt}$. Suppose $x_1,(t),x_2(t),\dots x_d(t)$ are d dependent Ornstein-Uhlenbeck processes where $dx_i(t) = -\frac{1}{2}\alpha x_i(t)dt + \sqrt{\alpha}dB_i(t)$, where $B_i(t)$ are standard Brownian motions , $\sqrt{\alpha}$ represents volatility and $-\frac{1}{2}\alpha$ is a mean-reversion rate.Here $x(t)$ follows normal distribution with $\left(x_i(0)e^{-\frac{\alpha t}{2}}; 1-e^{-\alpha t}\right)$.

The squared radius of the vector $x(t)$ is $R(t) = \sum_{i=1}^{d} x_i(t)^2 \rightarrow dR(t) = \sum_{i=1}^{d}\left(2x_i(t)dx_i(t) + d(x_i)(t)\right) = \alpha\left(d - R(t)\right)dt + \sqrt{4\alpha}d\widetilde{W}_i(t)$; $\theta = \frac{4\alpha}{\sigma^2}$ and $d = \frac{4\alpha\mu}{\sigma^2}$ and we have that $r(t) = \frac{R(t)}{\theta}$.

Definition: Let $(\mathcal{W}_t, \mathcal{F}_t)_{t\in(0,\infty)}$ be an $\mathbb{R}$-valued continuous stochastic process in probability space $(\Omega, \mathcal{F}, \mathcal{P})$,then $(\mathcal{W}_t, \mathcal{F}_t)_{t\in(0,\infty)}$ is called standard Brownian motion if:$\mathcal{W} = 0$; $\mathcal{W}_t - \mathcal{W}_s \sim \mathcal{N}(0, t-s)$; $\mathcal{W}_t - \mathcal{W}_s \perp \mathcal{F}_s$.An $\mathbb{R}^T$ valued process $\mathbb{W}_t$ is called T-dimensional Brownian motion with initial value $x \in \mathbb{R}^T$ if $\mathbb{W}_t = x + (W_t^1, \dots., W_t^T), \forall t \in (0,\infty)$, where $\mathcal{W}_t^i$ are standard Brownian motions, see Ewald (2003).From here we can obtain Fokker-Planck equation[8] for the PDF of finding Brownian particle at $\frac{dx}{dt}$

equation 2

$$\frac{\partial \rho}{\partial t} = \mu\frac{\partial}{\partial x}(\phi'(x)\rho) + D\frac{\partial \rho^2}{\partial x^2}$$

Furthermore we can write previous as follows :

equation 3

$$\frac{\partial P(X,t)}{\partial t} = \int_{n=1}^{\infty}\left(-\frac{\partial}{\partial X}\right)^n [D^n(X)P(X,t)]d(t)$$

Where :

equation 4

$$D^n(X_0) = \frac{1}{n!}\lim_{\Delta t\to 0}\frac{1}{\Delta t}[X(t+\Delta t) - X(t)^n]|_{t=0}$$

Which is commonly referred to as Kramers–Moyal expansion (see Kramers (1940), Moyal (1949)):$\frac{\partial p(x,t)}{\partial t} = \int dx'[W(x|x')p(x',t) - W(x'|x)p(x,t)]$.Where $p(x,t|x_0,t_0)$ is probability or transition probability density to an infinite order PDE (see Gardiner (2009)):

[4] see: https://github.com/FredericMartenet/entrepreneurs

[5] DYNARE code : https://faculty.wcas.northwestern.edu/lchrist/course/Korea_2012/CTW.html

[6] Benjamin Moll codes https://benjaminmoll.com/codes/

[7] See Uhlenbeck, G. E.; Ornstein, L. S. (1930).

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

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equation 5

$$\frac{\partial p(x,t)}{\partial t} = \sum_{n=1}^{\infty} \frac{(-1)^n}{n!} \frac{\partial^n}{\partial x^n} [a_n(x) p(x,t)]$$

Where $a_n(x) = \int_{-\infty}^{+\infty} (x' - x)^n W(x'|x) dx'$.So now lets get back to our previous equation: $\frac{\partial \rho}{\partial t} = \mu \frac{\partial}{\partial x}(\phi'(x)\rho) + D\frac{\partial \rho^2}{\partial x^2}$ which in the context of Brownian motion this is called Smoluchowski equation (see Smoluchowski, M. (1916)):

equation 6

$$\eta \frac{\partial w}{\partial t} = \nabla(w \nabla U) + T\nabla^2 w$$

Where $U(q,t)$ is time dependent potential,$w(q,t)$ are moments of probability density,

equation 7

$$m\,\ddot{q} + \eta\,\dot{q} + \frac{\partial U(q,t)}{\partial q} = \tilde{\mathcal{F}}(t)$$

Where :

equation 8

$$m\,\ddot{\tilde{q}} + n\,\dot{\tilde{q}} + k(t)\tilde{q} = \tilde{\mathcal{F}}(t); k(t) \equiv \frac{\partial^2}{\partial q^2} U(q(t),t)$$

The total probability is given as:

equation 9

$$W(t) = \int_{well's\ bottom} w(q,t) dq$$

Where barriers height of Kramer's problem is given as: $U_0 = U(q_2) - U(q_1)$,the Boltzmann distribution $w \propto \left\{-\frac{U(q)}{T}\right\}$ under decay law $\dot{W} = -\frac{W}{\tau}$ where the lifetime τ has to obey the Arrhenius law[9]:

equation 10

$$\tau = \tau_A \exp\left\{\frac{U_0}{T}\right\}$$

So in the context of our previous equation $\frac{\partial \rho}{\partial t} = \mu \frac{\partial}{\partial x}(\phi'(x)\rho) + D\frac{\partial \rho^2}{\partial x^2}$ it is convenient to write this equation in terms of probability of current S:

equation 11

$$\frac{\partial \rho}{\partial t} + \frac{\partial \rho}{\partial x} = 0; S = -\mu\phi'(x)\rho - D\frac{\partial \rho}{\partial x} = -Dexp\left(-\frac{\phi}{k_B T}\right)\frac{\partial}{\partial x}\left[\exp\left(\frac{\phi}{k_B T}\right)\rho\right]$$

Suppose a steady-state exists for the distribution i.e. some equilibrium. The state would $\exists \rightarrow S = 0$ so:

equation 12

$$\rho(x) = \rho_0 \exp\left(\frac{\phi}{k_B T}\right)$$

This exactly is Boltzmann formula.Or in most simple terms Ornstein- Uhlenbeck process is:

equation 13

$$dx = \mu dt + \sigma dW$$

Which is not-stationary random walk , but the following process is :

equation 14

$$dx = \theta(\bar{x} - x)dt + \sigma dW$$

Analogue to AR(1) process is autocorrelation $e^{-\theta} \approx 1 - \theta$ or : $x_{t+1} = \theta\,\bar{x} + (1-\theta)x_t + \sigma\varepsilon_t$

[9] $k = Ae^{\frac{E_a}{RT}}$; where A is the pre-exponential factor, k is the rate constant (frequency of collisions resulting in a reaction),$R$is universal constant.

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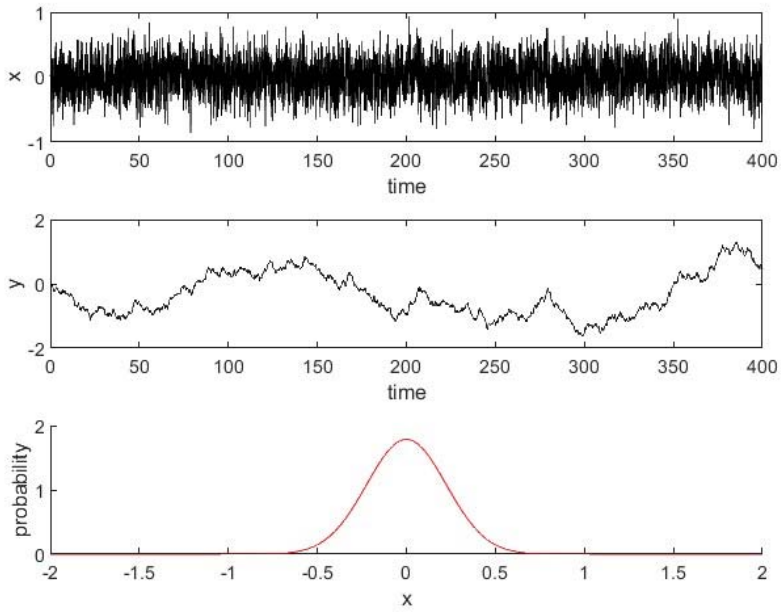
So now we chose $\mu(x) = \theta(\bar{x} - x)$ and we get a nice stationary process, which is called Ornstein-Uhlenbeck process.

Figure 1 Ornstein-Uhlenbeck process



Source : code provided by Travis Kupsche (2023). histNorm (https://www.mathworks.com/matlabcentral/fileexchange/27316-histnorm), MATLAB Central File Exchange. Retrieved March 6, 2023.

HJB equation

HJB equation is modeled as in Achdou et al.(2022). The deterministic optimal control problem is given as:

equation 15

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

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 16

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

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 17

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

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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 :

equation 18

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

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 19

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

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

equation 20

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

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 21

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

In vector notation previous is given as:

equation 22

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

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[10]:

equation 23

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

In vector notation:

equation 24

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

Now for the Kolmogorov Forward (Fokker-Planck[11]) equation we have folowing: let x be a scalar diffusion

equation 25

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

[10] 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).

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

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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 26

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

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 27

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

In the multivariate case Kolmogorov Forward Equation is given as:

equation 28

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

Comparison between Hamiltnian and HJB equation gives:

equation 29

$\mathcal{H}(x,u,\lambda) = h(x,u) + \lambda g(x,u)$ (Hamiltonian)

equation 30

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

Connection i.e. co-state value is $\lambda(t) = V'\big(x(t)\big)$ which is a shadow value. Bellman can be written as:

equation 31

$$\rho V(x) = \max_{u\in U}\mathcal{H}\big(x,u,V'(x)\big)$$

Finite difference method of HJB equation

Finite difference method of HJB equation is given as:

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 32

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

Two basic equations to explain Huggett economy are :

equation 33

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

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 34

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

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:

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equation 35

$$\int_{\underline{a}}^{\infty} ag_1(a,t)da + \int_{\underline{a}}^{\infty} ag_2(a,t)da = B$$

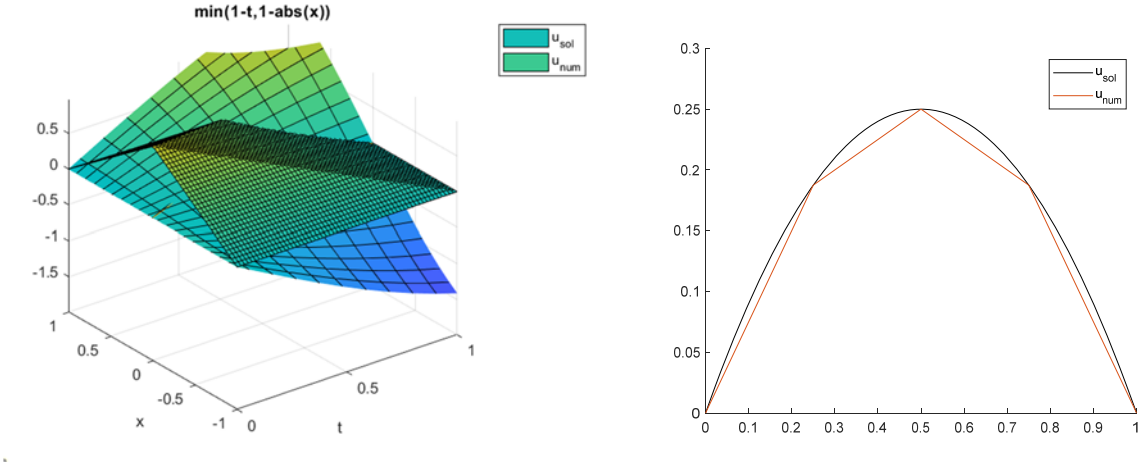
Where in previous expression $0 \leq B \leq \infty$ and when $B = 0$ that means that bonds are zero net supply. So the finite difference method approx. to $\begin{cases} \rho v_1(a) = \max_c u(c) + v_1'(a)(z_1 + ra - c) + \lambda_1(v_2(a) - v_1(a)) \\ \rho v_2(a) = \max_c u(c) + v_2'(a)(z_2 + ra - c)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

equation 36

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

$$c_{i,j} = (u')^{-1}(v_{i,j}')$$

Figure 2 (a,b) Finite difference method



Source: Greif, Constantin, "Numerical Methods for Hamilton-Jacobi-Bellman Equations" (2017). Theses and Dissertations. 1480.

CRRA utility

An example of Constant relative risk aversion is given as:

equation 37

$$u(x) = \frac{x^{1-\rho}-1}{1-\rho}$$

Note that $u'(x) = x^{-\rho}$ and $u''(x) = -\rho x^{\rho-1}$; $R(x) = xA(x) = -\frac{xu''(x)}{u'(x)}$.Where $A(x) = a$; and $u'(x) = ae^{-ax}$ and so $u''(x) = -a^2e^{-ax}$, or $A(x) = \frac{-u''(x)}{u'(x)}$.

Expected utility theorem

Next will give expected utility theorem

Theorem: X is a finite set of prizes,$\Delta(X)$ is a set of lotteries on X. Let $\succcurlyeq$ be a binary relation on ,$\Delta(X)$. Then $\succcurlyeq$ is complete, reflexive , transitive, and satisfies independence . Preference relation $\gtrsim$ is a relation $\gtrsim \subset \mathbb{R}_+^l \times \mathbb{R}_+^l$.With properties $x \gtrsim x, \forall x \in \mathbb{R}_+^l$ (reflexivity), $x \gtrsim y, y \gtrsim z \Rightarrow x \gtrsim z$ (transitivity), $\gtrsim$ is a closed set (continuity), $\forall(x \gtrsim y), \exists(y \gtrsim x)$ (completeness) ,given $\gtrsim, \forall\ (x \gg 0)$ the at least good set $\{y: y \gtrsim x\}$is closed relative to R^l (boundary condition), A is convex, if $\{y: y \gtrsim x\}$is convex set for every y , $ay + (1-\lambda)x \gtrsim x,$ whenever $y \gtrsim x$ and $0 < a < 1$, Mas-Colell, A. (1989).

Lemma 1: If $\succcurlyeq$ is complete, reflexive, transitive, and satisfies independence then:

1. $p \succ q$ and $0 \leq \alpha < \beta \leq 1$
   $\beta p + (-\beta + 1)q \succ \alpha p + (1-\alpha)q$
2. $p \succcurlyeq q \succcurlyeq r; p \succ r\ ; \exists \alpha^* \Rightarrow q \sim \alpha^* p + (1-\alpha)r^*$

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Well in the standard model of one risk-free asset and one risky asset, under constant relative risk aversion the fraction of wealth optimally placed in the risky asset is independent of the level of initial wealth, (see Arrow(1965)).

MIT shock

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).

Euler equation

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

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

equation 38

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

Proof: differentiate $\rho v_j(a) = \max_c u(c) + v_j'(a)\big(y_j + ra - c\big) + \lambda_j\left(v_{-j}(a) - v_j(a)\right)$ 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 39

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

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 40

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

Generalized Euler equations when W is defined recursively $W_{t+1} = R(W_t - c_t)$ previously we should define that $\sum_{t=1}^{\infty} R^{-t+1}c_t \leq W_1$ and gross interest rate $R = r + 1$; are given in the following form:

equation 41

$$u'(c_t) = R\left[\beta\delta\left(\frac{\partial c_{t+1}(W_{t+1})}{\partial W_{t+1}}\right) + \delta\left(1 - \frac{\partial c_{t+1}(W_{t+1})}{\partial W_{t+1}}\right)\right]u'(c_{t+1})$$

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Where $\left[\beta\delta\left(\frac{\partial c_{t+1}(W_{t+1})}{\partial W_{t+1}}\right)+\delta\left(1-\frac{\partial c_{t+1}(W_{t+1})}{\partial W_{t+1}}\right)\right]$ is the effective discount factor, also $c_{t+1}(W_{t+1})$ represents the optimal consumption choice. With uncertainty Euler equation will become:
equation 42

$$u'(c_t)=\beta R\hat{E}\left[u'(c_{t+1})|I_t\right]$$

Where $\hat{E}\left[u'(c_{t+1})|I_t\right]$ represents the agents, expectation given the information set I_t.Now, taking 2nd order approx.to marginal utility in $t+1$ around c_t gives:
equation 43

$$\hat{E}\left[\frac{c_{t+1}-c_t}{c_t}|I_t\right]=\sigma_t(1-(\beta R)^{-1})+\frac{1}{2}\phi_t\hat{E}[(c_{t+1}-c_t)^2|I_t]$$

Where $\phi_t=-\frac{c_t u'''(c_t)}{u''(c_t)}$ is a coefficient of relative prudence (see Dynan (1991), expected consumption growth that rises with the real interest rate and falls with impatience.In continuous time previous would be:
equation 44

$$\frac{\dot{c}_t}{c_t}=\sigma_t(r-\rho)$$

Where $\sigma_t=-\frac{u'(c_t)}{c_t u''(c_t)}$; and $c_{t+\Delta t}=c_t+\Delta c_t, \beta=1-\rho\Delta t;\ \Delta t\to 0$ .Now, let's consider that $\varepsilon_{t+1}=u'(c_{t+1})-(\beta R)^{-1}u'(c_t)$ as in Hall (1978) . It was pointed by Hall (1978) that this equation $u'(c_t)=\beta R\hat{E}\left[u'(c_{t+1})|I_t\right]$ implies that $\hat{E}[\varepsilon_{t+1}z_t|I_t]=z_t\hat{E}[\varepsilon_{t+1}|I_t]$ for any $z_t\in I_t$.

Entrepreneurship and financial frictions (code example by Benjamin Moll)
This model is due to: Achdou et.al (2014); Buera and Shin (2013) and Cagetti and De Nardi (2006). A version with aggregate shocks and business cycle implications will be presented:

1. $\mathbb{E}_0\int_0^\infty e^{-\rho t}u(c_t)dt$ (Individual preferences)
2. $wz^\theta;\theta\geq 0$ (labor income of workers from z earnings)
3. $y_u=F_u(z,k,\ell)=zB_u k^\alpha \ell^\beta$ (unproductive technology)
4. $y_p=F_p(z,k,\ell)=zB_p((k-f_k)^+)^\alpha((\ell-f_\ell)^+)^\beta$ (productive technology)
5. $B_p>B_u$ per-period overhead costs f_k-F_ℓ (productivity of unproductive and productive entrepreneurs)
6. $A_t\equiv qk^{t-1}+B_t$ where B_t is the borrowers liquid savings or debt if $B_t<0$; qk^{t-1} is the value of housing services
7. $\forall x, x^+=\max\{x,0\}$
8. F_p non concave in k,ℓ
9. z:idisosyncratic shock
10. Collateral constraints are: $k\leq\lambda a$; $\lambda\geq 1$
11. $\left(1-\tau_{y_i}\right)e_i\left(k_i^a\ell_i^{1-\alpha}\right)^{1-\nu}=wl_i-(\delta+r)k_i$; $k_i\leq\lambda a_i$
12. financial frictions apply equally to everyone in the economy—λ has no individual subscript, τ_{y_i} has and it is individually specific.
13. τ_{y_i} –taxes/subsidies/wedges on output
14. $\tau_+(\geq 0);\tau_-(\leq 0)\forall e$; $\Pr\{\tau_y=\tau_+|e\}=1-e^{-qe}$
15. $\lambda\in\{1,\infty\}-1$ financial autarky; ∞ - perfect credit, maximum leverage ratio
16. Income maximization: $M(a,z,A;w,r)=\max\{wz^\theta,\Pi_u(a,z,A;w,r),\Pi_p(a,z,A;w,r)\}$; $\Pi_j(a,z,A;w,r)=\max_{k<-\lambda a}F_j(z,A,k,l)-(r+\delta)k-wl; j=p,u$
17. Individuals solve:\

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equation 45

$$\max_{\{c_t\}} \mathbb{E}_0 \int_0^{\infty} e^{-\rho t} u(c_t) dt \;\; s.t \; da_t = [M(a_t, z_t, A_t; w_t, r_t) + r_t a_t - c_t]dt \; ; dzt = \mu z(t)dt + \sigma(z_t)dW_t; \; a_t \geq 0$$

18. Optimal capital and labor choices corresponding to the productive technology are given as:

equation 46

$$k_p(a; z; w; r) = \min\left\{\lambda a, (zAB_p)^{\frac{1}{1-\alpha-\beta}} \left(\frac{\beta}{w}\right)^{\frac{\beta}{1-\alpha-\beta}} + f_k\right\};$$

$$\ell_p(a, z, w, r) = \left(\frac{\beta z \; AB_p}{w}\right)^{\frac{1}{1-\beta}} k_p(a, z, w, r)^{\frac{\alpha}{1-\beta}} + f_\ell$$

19. Equilibrium conditions are:

equation 47

$$\rho v(a, z, t) = \max_c u(c) + \partial_a v(a, z, t)\big[M\big(a, z; w(t)\big) + r(t)a - c\big] + \partial_z v(a, z, t)\mu(z) + \frac{1}{2}\partial_{z.z} v(a, z, t)\sigma^2(z) + \partial_t vv(a, z, t)$$

equation 48

$$\partial_t g(a, z, t) = -\partial_a[s(a, z, t)g(a, z, t)] - \partial_z\left[\mu(z)g(a, z, t) + \frac{1}{2}\partial_{zz}[\sigma^2(z)g(a, z, t)]\right]$$

Where g is PDF of the statistical distribution.

In previous $\partial_a v = \frac{\partial v}{\partial a}$ and the optimal savings function is given as:

equation 49

$$s(a, z, t) = M(a, z; w(t), r(t) + r(t)a - c(a, z, t)$$

In previous current assets $a =\neq (1 + r)a + p - c$; and p are social security payments,c is consumption and utility from consumption is givenas $u(c) = \frac{c^{1-\sigma}}{1-\sigma}$ as in Cagetti and De Nardi (2006) where public firms maximize:

equation 50

$$r(t) = \partial_K F_c\big(A, K_c(t), L_c(t)\big) - \delta$$
$$w(t) = \partial_L F_c(AK_c(t), L_c(t)$$

Capital and labor market clear at:

equation 51

$$K_c(t) = \int ag(a, z, t)dadz$$
$$L_c(t) = \int z^\theta \, \mathbf{1}_{\{wz^\theta > \max\{\Pi_u, \Pi_p\}\}} g(a, z, t)dadz$$

Where $\mathbf{1}_{\{wz^\theta > \max\{\Pi_u, \Pi_p\}\}}$ is an indicator function[12] and:

equation 52

$$\mathbf{1}: wz^\theta > \max\{\Pi_u, \Pi_p\}$$

Defined as:

equation 53

$$\mathbf{1}: \begin{cases} 1 \;\; \because wz^\theta > \max\{\Pi_u, \Pi_p\} \\ 0 \; \therefore z^\theta \leq \max\{\Pi_u, \Pi_p\} \end{cases}$$

Where θ represents entrepreneurial ability. Now about numerical computation given $\xi_l = K_c/L_c$ and then find (compute) $L_{c,l} = \frac{K_{c,l}}{\xi_l}$ so that "excess demand" is given as:

[12] Indicator function is a function that returns 1 if an element is present in a specified subset and 0 if absent; naturally isomorphic with a set's subsets.

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equation 54

$$D_l = L_c(t) + \int l_u\big(a,z,w(t),r(t)\big)\,\mathbf{1}_{\{\Pi_u > \max\{\Pi_p, wz^\theta\}\}} g(a,z,t)dadz + \int l_p\big(a,z,w(t);r(t)\big)\,\mathbf{1}_{\{\Pi_u > \max\{\Pi_p, wz^\theta\}\}} g(a,z,t)dadz - \int z^\theta \mathbf{1}_{\{wz^\theta > \max\{\Pi_u;\Pi_p\}\}} g(a,z,t)dadz$$

Next Savings,consumption function as well as wealth function with entrepreneurship are presented.

Figure 3 savings and consumption functions with entrepreneurship

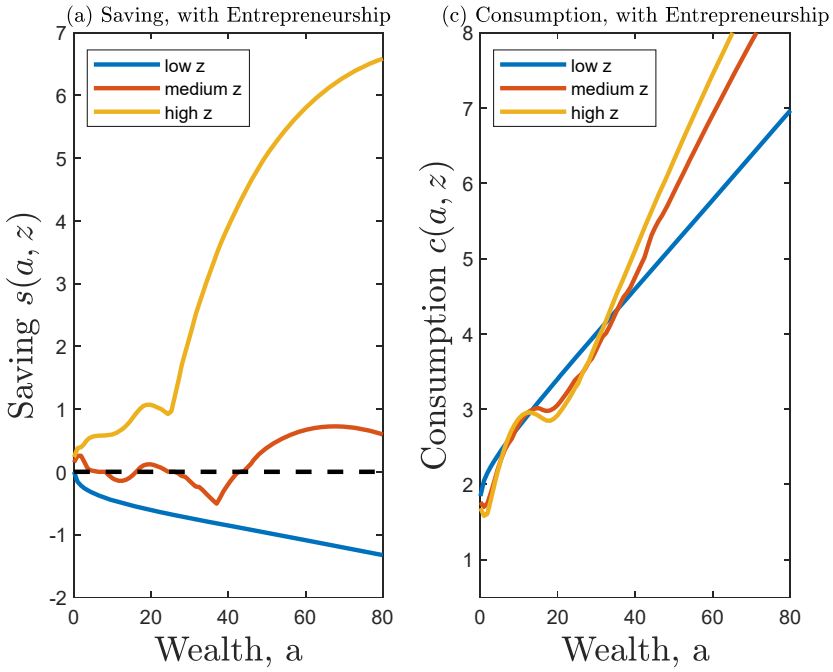

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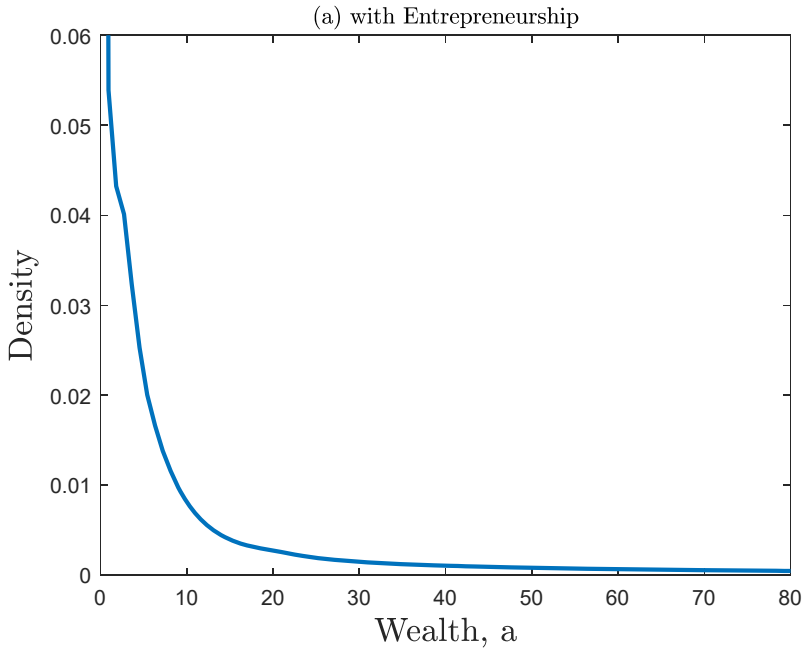
Figure 4 Wealth with entrepreneurship



Source code: Benjamin Moll codes https://benjaminmoll.com/codes/

Endogenous entrepreneurship and financial frictions

Code used in this part was written by Frederic Martenet [13].In this model there are continuum of individuals that differ in wealth a and entrepreneurial ability z. Entrepreneurial ability z Is drawn from Pareto distribution:

equation 55

$$\mu_{pdf}(z) = \eta z^{-\eta-1}, z \geq 1$$

Entrepreneurial ability is persistent in each period ability is drawn with probability γ .Banks collect deposits and rent out capital to entrepreneurs with rate $R = r + \delta$ where r is deposit rate. There is also representative public firm. Government taxes all entrepreneurial profits and revenues τ^{π} and τ^{y}, and rebates receipts with lump-sum payments $\mathcal{T}_t$.CRRA preferences are given as:

equation 56

$$\max \mathbb{E}_0 \sum_{t=0}^{\infty} \beta^t \frac{c_t^{1-\sigma} - 1}{1-\sigma}$$

Inverse intertemporal elasticity of substitution is σ .The budget constraint is given as:

equation 57

$$c_t + a_{t+1} \leq \max\{w_t, \pi(z_t, a_t)\} + (1 + r_t)a_t + \mathcal{T}_t$$

Profits from operation technology are given as:

equation 58

$$\pi(z_t, a_t) = \max_{l_t, k_t}\{(1-\tau_t^{\pi})\left[(1-\tau_t^{y})z_t Z_t (k_t^{a} l_t^{1-a})^{1-v} - w_t l_t - (\delta + r_t)k_t\right]\}$$

$$\text{s.t. } k_t \leq \lambda a_t$$

individuals with productivity z_t choose to become entrepreneurs if their wealth exceeds the threshold value $\bar{a}(z_t)$ which solves :

equation 59

$$w_t = \pi(z_t, \bar{a}(z_t))$$

[13] See: https://github.com/FredericMartenet/entrepreneurs

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The technology operated by individual entrepreneurs has decreasing returns to scale :
equation 60

$$y_t = f(z,k,l) = zZ_t(k^a l^{1-a})^{1-v}$$

$Z_t = \sum z_t$ or they are aggregate TFP shocks. On the other hand, public firm operates with constant returns to scale of CRS technology:
equation 61

$$F(K_{ct}, L_{ct}) = Z_t Z_{ct} K_{ct}^a L_{ct}^{1-a}$$

FOCs are given as:
equation 62

$$r_t = aZ_t Z_{ct} K_{ct}^a L_{ct}^{-a+1}$$
$$w_t = (1-a)Z_t Z_{ct}\left(\frac{K_{ct}}{L_{ct}}\right)^a$$

Capital-labor ratio is given by:
equation 63

$$\frac{K_{ct}}{L_{ct}} = \left(\frac{aZ_t Z_{ct}}{r_t + \delta}\right)^{\frac{1}{-a+1}}$$

Labor market clearing condition is given as:
equation 64

$$L_{ct} + \int_R l_t(z,a) dD_t(a,z) - \int_w dD_t(a,z) = 0$$

Asset market (capital market) clears:
equation 65

$$K_{ct} + \int_E k_t(z,a) s D_t(a,z) - \int aD_t(a,z) = 0$$

Government budget balance is given as:
equation 66

$$\mathcal{T}_t = \int_E \left[(\tau_t^\pi + \tau_t - \tau_t^\pi \tau_t) y_t(z,k,l) - \tau_t^\pi \left(w_t l_t(z,a) + (\delta + r_t) k_t(z,a)\right)\right] dD_t(a,z)$$

$D_t(a,z)$ is some distribution of assets and skills and initial distribution is given as $D_0(a,z)$.
Now when solving for entrepreneurial profits:

$$\pi(z_t, a_t) = \max_{l_t, k_t}\left\{(1-\tau_t^\pi)^{1-v}\left[\left(1-\tau_t^y\right) z_t Z_t (k_t^a l_t^{1-a})^{1-v} - w_t l_t - (\delta + r_t) k_t\right]\right\}$$
$$\text{s.t. } k_t \leq \lambda a_t$$

if collateral constraint is binding following applies : $k^c(a_t) = \lambda a_t$ or if the collateral constraint is not binding then we have:
equation 67

$$k^u(z_t) = \left[\left(1-\tau_t^y\right) z_t Z_t\right]^{\frac{1}{v}} \left(\frac{a(1-v)}{r_t + \delta}\right)^{\frac{1-(1-a)(1-v)}{v}} \left(\frac{(1-a)(1-v)}{w_t}\right)^{\frac{(1-a)(1-v)}{v}}$$

Capital policy function is given as:
equation 68

$$k(z_t, a_t) = \min\{k^c(a_t), k^u(z_t)\}$$

Labor policy function is given as:
equation 69

$$l(z_t, a_t) = \left(\frac{(1-a)(1-v)\left(1-\tau_t^y\right) z_t Z_t}{w_t}\right)^{\frac{1}{1-(1-a)(1-v)}} k(z_t, a_t)^{\frac{a(1-v)}{1-(1-a)(1-v)}}$$

Indirect profit function is given by :
equation 70

$$\pi(z_t, a_t) = (1-\tau_t^\pi)\left[\left(1-\tau_t^y\right) z_t Z_t (k(z_t, a_t)^a l(z_t, a_t)^{1-a})^{1-v} - w_t l(z_t, a_t) - (\delta + r) k(z_t, a_t)\right]$$

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τ_t^{π} does affect policies and τ_t^{y} does not. Bellman equation here can be written as:
equation 71

$$v_t(a_t, z_t) = \max_{c_t, a_{t+1}} \left\{ u(c_t) + \beta \left[\gamma v_{t+1}(a_{t+1}, z_t) + (1-\gamma) \int v_{t+1}(a_{t+1}. z_{t+1}) \mu(z_{t+1}) dz_{t+1} \right] \right\}$$

s.t. $c_t + a_{t+1} = M(a_{t+1}, z_t) + (1 + r_t)a_t + \mathcal{T}_t$
where $M(a_{t+1}, z_t) = \max\{w_t, \pi(z_t, a_t)\}$ and the corresponding Euler equation is given as:
equation 72

$$\begin{aligned} & u'\big(c_t(z_t, a_t)\big) \\ & = \beta \Big[\gamma \left(1 + r_{t+1}^{eff}(z_t, a_{t+1}, d_{t+1})\right) u'(c_{t+1}(z_t, a_{t+1}) \\ & + (1 \\ & - \gamma) \int \left(1 + r_{t+1}^{eff}(z_{t+1}, a_{t+1}, d_{t+1})\right) u'\big(c_{t+1}(z_{t+1}, a_{t+1}, d_{t+1})\big) u'(c_{t+1}(z_{t+1}, a_{t+1})) \mu(z_{t+1} dz_{t+1} \Big] \end{aligned}$$

Effective rate of return r_t^{eff} is defined as:
equation 73

$$r_t^{eff}(z_t, a_t) = \begin{cases} r_t \; if \; worker \\ r_t + \dfrac{\partial \pi(z_t, a_t)}{\partial a_t} \; if \; entrepreneur \end{cases}$$

Where :

$$\frac{\partial \pi(z_t, a_t)}{\partial a_t} = \begin{cases} \dfrac{\partial \pi^{const}(z_t, a_t)}{\partial a_t} \; if \; worker \\ 0 \; if \; unconstrained \; entrepreneur \end{cases}$$

Cash on hand for the next period on the grids a, z
equation 74

$$coh(z_{t+1}, a_{t+1}) = M(z_{t+1}, a_{t+1}) + (1 + r_t)a_{t+1} + \mathcal{T}_t$$

Right hand side of Euler equation $u'\big(c_t(z_t, a_t)\big) = \beta \Big[\gamma \left(1 + r_{t+1}^{eff}(z_t, a_{t+1}, d_{t+1})\right) u'(c_{t+1}(z_t, a_{t+1}) + (1-\gamma) \int \left(1 + r_{t+1}^{eff}(z_{t+1}, a_{t+1}, d_{t+1})\right) u'\big(c_{t+1}(z_{t+1}, a_{t+1}, d_{t+1})\big) u'(c_{t+1}(z_{t+1}, a_{t+1})) \mu(z_{t+1} dz_{t+1} \Big]$ is given as:
equation 75

$$\begin{aligned} RHS(a_{t+1} z_t) = \beta \Big[& \gamma \left\{ 1 + r_{t+1}^{eff}(z_t, a_{t+1}) \right\} u'\big(c_{t+1}(z_t, a_{t+1})\big) \\ & + (1-\gamma) \int \left\{ 1 + r_{t+1}^{eff}(z_{t+1}, a_{t+1}) \right\} \mu(z_{t+1}) d\_z_{t+1} \Big] \end{aligned}$$

This inverted will give us consumption function:
equation 76

$$c(a_{t+1}, z_t) = \frac{1}{u\big(RHS(a_{t+1} z_t)\big)}$$

Asset policy function is given as:
equation 77

$$a_t = \frac{c_t(a_{t+1}, z_t) + a_{t+1} - M(a_{t+1}, z_t) - \mathcal{T}_t}{1 + r_t}$$

Results are graphically depicted in the following two figures.
Figure 5 Occupational choice, wealth distribution

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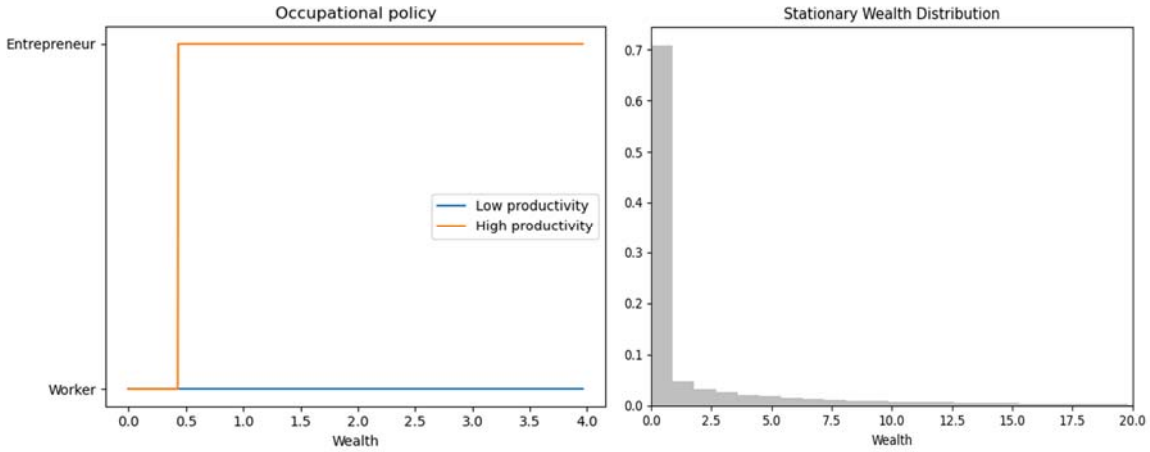
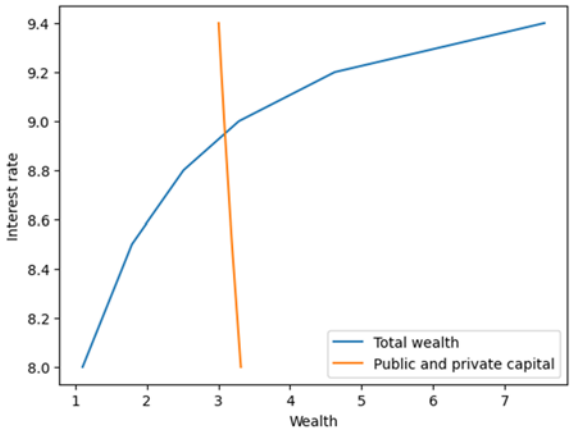


Figure 6 Equilibrium interest rate, total wealth ,and public ,private capital



Financial frictions and unemployment with entrepreneurs (snippet by Cristiano et al.2011)

This model starts with the following production function:

equation 78

$$Y_t = \left[\int_0^1 Y_{i,t}^{\frac{1}{\lambda^d}} di\right]^{\lambda_d} ; 1 \leq \lambda_d < \infty$$

Where Y_t is homogenous domestic good, $\frac{1}{\lambda^d}$ is a degree of substitutability. Intermediate good $Y_{i,t}$ is :

equation 79

$$Y_{i,t} = \left(z_t, H_{i,t}\right)^{1-\alpha} \epsilon_t K_{i,t}^{\alpha} - z_t^{+}\phi$$

Where $K_{i,t}^{\alpha}$ is capital rented and its services by intermediate goods producer, $\log\left(z_{i,t}\right)$ is a technology shock whose first-difference has positive mean, and ϕ denotes production costs. And Ψ_t denotes investment specific technology shock (IST),and z_t^{+} is :

equation 80

$$z_t^{+} = \Psi_t^{\frac{\alpha}{1-\alpha}} z_t$$

$H_{i,t}$ are homogeneous labor services, firms borrow fraction of wage bill, one unit of labor costs is denoted as $W_t R_t^f$ where:

equation 81

$$R_t^f = v^f R_t + 1 - v^f$$

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where W_t is the aggregate wage rate, R_t is the risk-free interest rate that applies to working capital loans and v^f corresponds to the fraction that must be financed in advance.Firms marginal costs are:

$$mc_t = \tau_t^d \left(\frac{1}{1-\alpha}\right)^{1-\alpha} \left(\frac{1}{\alpha}\right)^{\alpha} \left(r_t^k\right)^{\alpha} \left(\overline{w}_t R_t^f\right)^{1-\alpha} \left(\frac{1}{\epsilon_t}\right)$$

where r_t^k is the nominal rental rate of capital scaled by P_t and $\overline{w}_t = \frac{w_t}{z_t^+ P_t}$. Also, $\tau_t^d$is a tax-like shock, which affects marginal cost, but does not appear in a production function. In the linearization of a version of the model in which there are no price and wage distortions in the steady state, $\tau_t^d$is isomorphic to a disturbance in λ_d, i.e., a markup shock.Productive efficiency states that mc_t is equal to the cost of producing another unit using labor, which in turn implies :

equation 82

$$mc_t = \tau_t^d \frac{\left(\mu_{\psi,t}\right)^{\alpha} \overline{w}_t R_t^f}{\epsilon_t (1-\alpha) \left(\frac{\frac{k_{i,t}}{\mu_z^+}}{H_{i,t}}\right)^{\alpha}}$$

Price setting is subject to Calvo frictions. With probability ε_d the intermediate good firm cannot reoptimize its price, in which case following applies:

equation 83

$$P_{i,t} = \hat{\pi}_{d,t} P_{i,t-1} \; ; \hat{\pi}_{d,t} \equiv (\pi_{t-1})^{k_d} (\bar{\pi}_t^c)^{1-k_d-\chi_d} (\hat{\pi})^{\chi_d}$$

Where $k_d, \chi_d, k_d + \chi_d \in (0,1)$ are parameters π_{t-1} is lagged inflation rate and $\bar{\pi}_t^c$ is the CB target inflation rate. With probability $1 - \xi_d$ firm can change its price:

equation 84

$$E_t \sum_{j=0}^{\infty} \beta^j v_{t+j} \left\{P_{i,t+j}, Y_{i,t+j} P_{t+j} Y_{(i,t+j)}\right\}$$

Previous expression are discounted profits. Demand is given by:

equation 85

$$\left(\frac{P_t}{P_{i,t}}\right)^{\frac{\lambda_d}{\lambda_d - 1}} Y_t = Y_{i,t}$$

Domestic intermediate output good is allocated as follows:

equation 86

$$Y_t = G_t + C_t^d + I_t^d + \int_0^1 X_{i,t}^d$$

Where G_t denotes government consumption, C_t^d denotes intermediate goods used to produce final consumption goods, also I_t^ds the amount of intermediate domestic goods used in combination with imported foreign investment goods to produce a homogeneous investment good. Final consumption goods are :

equation 87

$$C_t = [(1-\omega_c)]^{\frac{1}{\eta_c}} \left(C_t^d\right)^{\frac{\eta_c - 1}{\eta_c}} + \omega_c^{\frac{1}{\eta_c}} (C_t^m)^{(\eta_c - 1)/\eta_c}]^{\frac{\eta_c}{\eta_{c_1}}}$$

C_t^d is the first input for final goods consumption production[14], and has a price P_c. The input prices for representative firm are:P_t, P_t^{mc} :

equation 88

$$c_t^d = (1-\omega_c)(P_t^c)^{\eta_c} c_t$$

[14] one-for-one transformation of the homogeneous domestic good

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$$c_t^m = \omega_c \left(\frac{p_t^c}{p_t^{mc}} \right) c_t$$

Where $P_t^c = p_t^c / p_t$ and $p_t^{mc} = p_t^{mc} / p_t$ and

equation 89

$$p_c^t = [(1 - \omega_c) + \omega_c (p_t^{mc})^{1-\eta_c}]^{\frac{1}{1-\eta_c}}$$

The rate of inflation of consumption goods is :

equation 90

$$\pi_t^c = \frac{p_t^c}{p_{t-1}^c} = \left[\frac{(1 - \omega_c) + \omega_c (p_t^{mc})^{1-\eta_c}}{(1 - \omega_c) + \omega_c (p_{t-1}^{mc})^{1-\eta_c}} \right]^{\frac{1}{1-\eta_c}}$$

Investment goods are produced as:

equation 91

$$I_t + a(u_t)\overline{K}_t = \Psi_t \left[(1 - \omega_i)^{\frac{1}{\eta_i}} \left(I_t^d \right)^{\frac{\eta_t - 1}{\eta_i}} \right]^{\frac{\eta_i}{\eta_i - 1}}$$

The sum of investment goods is I_t , plus investment goods in capital maintenance $a(u_t)\overline{K}_t$,where:

equation 92

$$K_t = u_t \overline{K}_t$$

And u_t denotes utilization rate of capital. Profit maximization leads to:

equation 93

$$i_t^d = \left(p_t^i \right)^{\eta_i} \left(i_t + a(u_t) \frac{\overline{k_t}}{\mu_{\psi,t}, \mu_{z,t}^+} \right)$$

$$i_t^m = \omega_i \left(\frac{p_t^i}{p_t^{m,i}} \right)^{\eta_i} \left(i_t + a(u_t) \frac{\overline{k_t}}{\mu_{\psi,t}, \mu_{z,t}^+} \right)$$

Where $p_t^i = \frac{\Psi_t p_i^t}{p_t}$ and $p_t^{m,i} = \frac{p_t^{m,i}}{p_t}$,the price of I_t is given as:

equation 94

$$p_t^i = \left[(1 - \omega_i) + \omega_i \left(p_t^{mi} \right)^{1-\eta_i} \right]^{\frac{1}{1-\eta_i}}$$

The rate of inflation of investment good is :

equation 95

$$\pi_t^i = \frac{p_t^i}{p_{t-1}^i} = \left[\frac{(1 - \omega_i) + \omega_i \left(p_t^{mi} \right)^{1-\eta_i}}{(1 - \omega_i) + \omega_i \left(p_{t-1}^{mi} \right)^{1-\eta_i}} \right]^{\frac{1}{1-\eta_i}}$$

Homogenous labor service is given as:

equation 96

$$H_t = \left[\int_0^1 \left(h_{j,t} \right)^{\frac{1}{\lambda_w}} dj \right]^{\lambda_w} ; 1 \leq \lambda_w, \infty$$

With probability $1 - \xi_w$ household jth can reoptimize its wage according to:

equation 97

$$w_{j,t+1} = \bar{\pi}_{w,t+1} W_{j,t}$$

$$\bar{\pi}_{w,t+1} = (\pi_t^c)^{k_w} (\bar{\pi}_{t+1}^c)^{1 - k_w - \chi_w} (\hat{\pi})^{\chi_w} (\mu_{z^+})^{\varrho_w}$$

Where $k_w + \chi_w, k_w, \chi_w, \varrho_w \in (0,1)$.Now households reoptimize:

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equation 98

$$E_t^i \sum_{i=0}^{\infty} (\beta\xi_w)^i \left[-\xi_{t+1}^h A_L \frac{(h_{j,t+1}}{1+\sigma_L} + v_{t+i} W_{j,t+1} h_{j,t+1} \frac{1-\tau^y}{1+\tau^w} \right]$$

Where τ^y and τ^w are taxes on labor income and payroll tax respectively. And:

equation 99

$$h_{j,t+1} = \left(\frac{\overline{W}_t \hat{\pi}_{w,t+1}, \dots . \hat{\pi}_{w,t+1}}{W_{t+i}} \right)^{\frac{\lambda_m}{1-\lambda_m}} H_{t+i}$$

Next in the model financial frictions are introduced following assumption that working capital loans are frictionless. Our strategy of introducing frictions in the accumulation and management of capital follows the variant of the BGG model implemented in Christiano et al. (2003). The discussion and derivation here borrows heavily from Christiano et al. (2008).

Entrepreneurs and financial frictions in Christiano et al.2011

Entrepreneurs net-worth is given as:N_{t+1}. Entrepreneur combines net worth with bank loan B_{t+1} :

equation 100

$$B_{t+1} = P_t P_{k',t} \overline{K}_{t+1} - N_{t+1}$$

Entrepreneur must pay gross interest rate Z_{t+1} for the bank loan in period $t+1$. Risk free interest rate is :

equation 101

$$R_{t+1}^k = \frac{\left(1-\tau^k\right)\left[u_{t+1} r_{t+1}^k - \frac{p_{t+1}^i}{\Psi_{t+1}} a(u_{t+1})\right] P_{t+1} + (1-\delta) P_{t+1} + \tau^k \delta P_t P_{k',t}}{P_t P_{k',t}}$$

Where :

equation 102

$$a_t = \frac{S A_{t+1}^*}{P_t z_t^+}$$

A_{t+1}^* are the net-foreign assets. Real costs of assets are S_t/P_t.Cut of value for idiosyncratic productivity of entrepreneurs in order to be able to repay debt is given as:

equation 103

$$\overline{\omega}_{t+1} R_{t+1}^k P_t P_{k',t} \overline{K}_{t+1} = Z_{t+1} B_{t+1}$$

Entrepreneurs with $\omega < \overline{\omega}_{t+1}$ are bankrupt and turn over resources:

equation 104

$$R_{t+1}^k \omega P_t P_{k',t} \overline{K}_{t+1} < Z_{t+1} B_{t+1}$$

The bank monitors entrepreneur at cost:

equation 105

$$\mu R_{t+1}^k \omega P_t P_{k',t} \overline{K}_{t+1}$$

Where $\mu \geq 0$ is a parameter.For loans amounted B_{t+1} the bank receives gross interest rate $Z_{t+1} B_{t+1}$ from fraction $1 - H(\overline{\omega}_{t+1}; \sigma_t)$ of entrepreneurs who are not bankrupt, CDF is given as $(\omega, \sigma)$where σ is shock of idiosyncratic uncertainty. Zero profit condition is given as:

equation 106

$$[1 - F(\overline{\omega}_{t+1}; \sigma_t)] Z_{t+1} B_{t+1} + (1-\mu) \int_0^{\overline{\omega}_{t+1}} \omega dF(\omega; \sigma_t) R_{t+1}^k P_t P_{k',t} \overline{K}_{t+1} = R_t B_{t+1}$$

And after rearranging with using of $\overline{\omega}_{t+1} R_{t+1}^k P_t P_{k',t} \overline{K}_{t+1} = Z_{t+1} B_{t+1}$ we get:

equation 107

$$[\Gamma(\overline{\omega}_{t+1}; \sigma_t) - \mu_t G((\overline{\omega}_{t+1}; \sigma_t))] \frac{R_{t+1}^k}{R_t} \varrho_t = \varrho_t - 1$$

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Where
equation 108

$$G((\bar{\omega}_{t+1};\sigma_t) = \int_0^{\bar{\omega}_{t+1}} \omega dF(\omega;\sigma_t)$$

$$\Gamma(\bar{\omega}_{t+1};\sigma_t) = \bar{\omega}_{t+1}[1 - F(\bar{\omega}_{t+1};\sigma_t)] + \int_0^{\bar{\omega}_{t+1}} \omega dF(\omega;\sigma_t)$$

$$\varrho_t = \frac{P_t P_{k',t} \bar{K}_{t+1}}{N_{t+1}}$$

This is leverage ratio $\varrho_t = \frac{P_t P_{k',t} \bar{K}_{t+1}}{N_{t+1}}$ and it implies that :
equation 109

$$\frac{B_{t+1}}{N_{t+1}} = \varrho_t - 1$$

And rate of interest aid by the entrepreneur is:
equation 110

$$z_{t+1} = \frac{\bar{\omega}_{t+1} R^k_{t+1}}{1 - \frac{N_{t+1}}{P_t P_{k',t} \bar{K}_{t+1}}} = \frac{\bar{\omega}_{t+1} R^k_{t+1}}{1 - \frac{1}{\varrho_t}}$$

The motion law foe every entrepreneur is given as:
equation 111

$$V_t = R^k_t P_t P_{k',t} K_t - \Gamma(\bar{\omega}_t;\sigma_{t-1}) R^k_t P_{t-1} P_{k',t-1} K_t$$

Each entrepreneur face probability to exit economy γ which is identical for all entrepreneurs. Fraction of entrepreneurs who survive bankruptcy is $\gamma_t \bar{V}_t$ and a fraction of $1-\gamma$ entrepreneurs arrive. Entrepreneurs who survive or are new receive transfer $W^e_t = Z^+_t W^e$. The average net worth across all entrepreneurs is :
equation 112

$$\bar{N}_{t+1} = \gamma_t \bar{V}_t + W^e_t$$

Or alternatively:
equation 113

$$\bar{N}_{t+1} = \gamma_t \{R^k_t P_t P_{k',t-1} \bar{K}_t\} - \left[R_{t-1} + \frac{\mu \int_0^{\bar{\omega}_{t+1}} \omega dF(\omega;\sigma_{t-1}) R^k_t P_{t-1} P_{k',t} \bar{K}_t}{P_{t-1} P_{k',t-1} \bar{K}_t - \bar{N}_t}\right]$$

Because of its direct effect on entrepreneurial net worth, we refer to λ_t as the shock to net worth.

Labor market fictions in this model [Christiano et al.2011]
Economists had been using search models for more than 50 years to describe labor market more closely. And the seminal work of Diamond(1982); Pissarides (1985); and Mortensen and Pissarides (1994), had become a framework for macroeconomists to study unemployment. Matching function is given as:$mL = m(uL, vL)$,it is concave and homogenous of degree 1. Homogeneity or constant returns to scale. Where u is unemployment rate, v -vacancy rate, uL unemployed worker L-total labor force, and vL job vacancies. Vacancy to filled jobs equals $\frac{v}{u}$ is denoted to θ [15] and equals to: $\theta = m\left(\frac{u}{v}, 1\right)$.Also, δt is a small time interval during some vacant job is matched to an unemployed person,with a probability $q(\theta)\delta t$. Toa related Poisson

[15] $\theta = \frac{v}{u}$ is a market tightness, and for the firms probability of filling a vacancy is given as:$\frac{m(u,v)}{v} = m\left(\frac{1}{\theta}, 1\right) \equiv q(\theta)$, and $q'(\theta) < 0$; and for the workers probability of finding a job is: $\frac{m(u,v)}{v} = m(1,\theta) \equiv \theta q(\theta)$.There flowing applies : $\lim_{\theta\to 0}[\theta q(\theta)] = \lim_{\theta\to\infty} q(\theta) = 0$ and $\lim_{\theta\to\infty}[\theta q(\theta)] = \lim_{\theta\to\infty} q(\theta) = +\infty$

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proces $\lambda = \frac{m(uL,vL)}{uL}$ where $\lambda = \theta q(\theta)$ and has elasticity $1 - \eta(\theta) \geq 0$ .The mean duration of unemployment is $1/\theta q(\theta)$.The evolution of unemployment is given as:

equation 114

$$\dot{u} = \lambda(1-u) - \theta q(\theta) u$$

V is the present-discounted value of expected profit from a vacant job and satisfies Bellman equation:

equation 115

$$rV = -pc + q(\theta)(J - V).$$

The permanent incomes of unemployed and employed workers, in terms of the returns z and w and the discount and transition rates:

equation 116

$rU = \frac{(r+\lambda)z+\theta q(\theta)w}{r+\lambda+\theta q(\theta)}$; $rW = \frac{\lambda z+[r+\theta q(\theta)]w}{r+\lambda+\theta q(\theta)}$

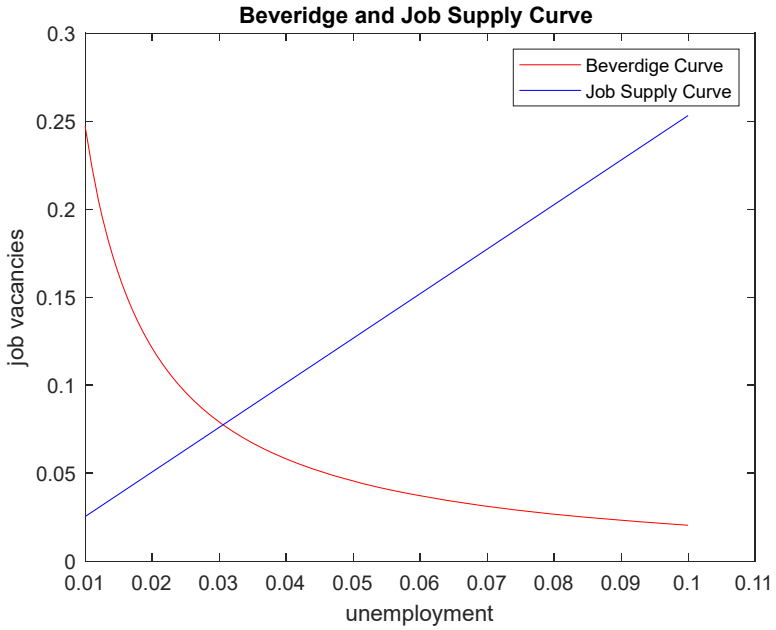
The job is worth t the worker : $rW_i = w_i - \lambda(W_i - U)$the job rate for this job satsfies :

equation 117

$$w_i = argmax(W_i - U)^{\beta}(J_i - V)^{1-\beta}$$

β is labor's share of the total surplus that an occupied job creates,$0 \leq \beta \leq 1$, $\beta = \frac{1}{2}$ is the most plausible value.Now, rU -reservation wage, $\beta(p-r)$ fraction of net surplus they create by accepting the job, product value net of what they give up[16], $rU \Rightarrow rU = z + \frac{\beta}{1-\beta} pc\theta$. Aggregate wage equation that holds in equilibrium, is given as: $w = (1-\beta)z + \beta p(1 + c\theta)$.

Figure 7 DMP model without benefit shock



Source: author calculation based on the code published on: https://github.com/pdevlieger/MatLab-files

[16] It is intuitive for a market equilibrium if we note that $pc\theta$ is the average hiring cost for each unemployed worker (since $pc\theta = pcv/u$ and pcv is total hiring cost in the economy).

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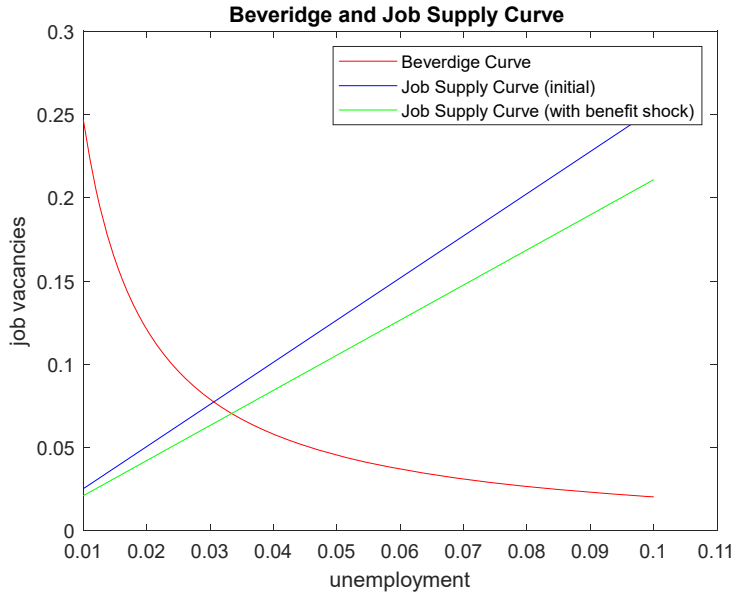
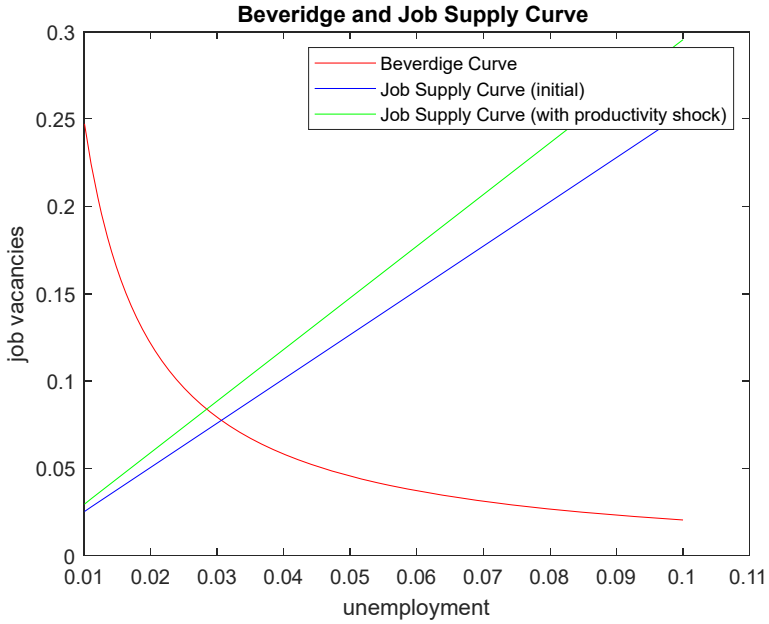
Figure 8 DMP model with benefit shock



Source: author calculation based on the code published on:
https://github.com/pdevlieger/MatLab-files

Figure 9 DMP model with productivity shock



Source: author calculation based on the code published on:
https://github.com/pdevlieger/MatLab-files

That was the textbook model DMP, but in this model hours worked are presented as:

equation 118

$$E_t \sum_{t-0}^{\infty} \beta^{l-t} \left\{ \xi_{t+1}^{c} \log(C_{t+1} - bC_{t+l-1}) - \xi_{t+l}^{h} \left[\sum_{i=0}^{N-1} \frac{(\varsigma_{i,t+l})^{1+\sigma_L}}{1+\sigma_L} \left[1 - \mathcal{F}(\bar{a}_{t+1}^{i}; \sigma_{a,t+l} \right] \right] I_{t+1}^{i} \right\}$$

Where $i \in \{0, N-1\}$ represents cohort where agency belongs. And I_{t+1}^{i} represents number of workers in the cohort$i$,after endogenous separations and new arrivals. And $a_t^i < \bar{a}_t^i$ are laid of from the firm. Also:

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equation 119

$$\mathcal{F}_t^i = \mathcal{F}\left(\bar{a}_t^i; \sigma_{a,t}\right) = \int_0^{\bar{a}_t^i} d\mathcal{F}\left(a; \sigma_{a,t}\right)$$

The disutility experienced by worker form working hours is given as:

equation 120

$$\xi_t^h A_L = \frac{\left(\varsigma_{i,t}\right)^{1+\sigma_L}}{1+\sigma_L}$$

each household has sufficiently many workers so that the total fraction of workers employed

equation 121

$$L_t = \sum_{i=0}^{N-1} \left[1 - \mathcal{F} + t^i\right] I_t^i$$

The household currency receipts from labor market are given as:

equation 122

$$(1-\tau^y)(1-L_t)P_t b^u z_t^+ + \sum_{i=0}^{N-1}\left[1-\mathcal{F}_t^i\right] I_t^i \varsigma_{i,t} \frac{1-\tau^y}{1+\tau^w}$$

Where $b^u z_t^+$ is a pre tax payment to the workers. Firm is posting vacancies as a:

equation 123

$$\tilde{v}_t^i \equiv \frac{Q_t^l v_t^i}{\left(1-\mathcal{F}_t^i\right) I_t^i}$$

The agency hiring rate is:$\chi_t^i = Q_t^{1-I}\tilde{v}_t^i$.Where Q_t represents probability of filing vacancy. The value function of the firms is given as:

equation 124

$$F(l_t^0, \omega_t) = \sum_{j=0}^{N-1} \beta^j E_t \frac{V_{t+j}}{v_t} , \max_{\tilde{v}_{t+j}; \bar{a}_{t+j}} \left[\int_{\bar{a}_{t+j}^j}^{\infty} (W_{t+j} a - \left[\Gamma_{t,j}\dot{\omega}_t\right)\varsigma_{j,t+j} d\mathcal{F}(a) - P_{t+j} \frac{k z_t^+{}_{i+j}}{\varphi} \left(\tilde{v}_{t+j}^j\right)^{\varphi} (1 - \mathcal{F}_{t+j}^j) \right] I_{t+j}^i + \beta^N E_t \frac{v_{t+N}}{v_t} F(I_{t+N}^0, \widetilde{W}_{t+N})$$

Where :

equation 125

$$\Gamma_{t,j} = \begin{cases} \hat{\pi}_{w,t+j}, \dots, \hat{\pi}_{w,t+1}, j > 0 \\ 1 \qquad\qquad , j = 0 \end{cases}$$

$\Gamma_{t,j}\dot{\omega}_t$ represents the wage rate in period $t+j$ .Value function from being worker in an agency in period t is V_t^i and:

equation 126

$$V_t^i = \Gamma_{t-1,i}\widetilde{W}_{t-1}\varsigma_{i,t}\frac{1-\tau^y}{1+\tau^w} - A_L \frac{\xi_t^h \varsigma_{i,t}^{1+\sigma_L}}{(1+\sigma_L)v_t} + \beta E_t \frac{v_{t+1}}{v_t}\left[\rho\left(1-\mathcal{F}_{t+1}^{(i+1)}\right)V_{t+1}^{i+1} + 1 - \rho + \rho\mathcal{F}_{t+1}^{(i+1)}\right) U_{t+1}\Big]$$

$\Gamma_{t-1,i}\widetilde{W}_{t-1}$ represents the wage received by cohort i at time t. The currency value fo being unemployed is given as:

equation 127

$$U_t = P_t z_t^+ + b^u(1-\tau^y) + \beta E_t \frac{v_{t+1}}{v_t}\left[f_t V_{t+1}^{\chi} + (1-f_t)U_{t+1}\right]$$

Where f_t is the probability that an unemployed worker will land job in period $t+1$.Also V_{t+1}^{χ} is period $t+1$ function of a worker who knows that he has matched with an unemployment agency at the start of period $t+1$. And following applies:

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equation 128

$$V_{t+1}^{\chi} = \sum_{i=0}^{N-1} \frac{\chi_t^i \left(1 - \mathcal{F}_t^i\right) I_t^i}{m_t} \tilde{V}_{t+1}^{i+1}$$

Total matching function is given as:

equation 129

$$m_t = \sum_{j=0}^{N-1} \chi_t^j \left(1 - \mathcal{F}_t^i\right) I_t^j$$

The aggregate surplus across all I_t^0 workers in the representative agency is given by:

equation 130

$$(V_t^0 - U_t)(1 - \mathcal{F}_t^0) I_t^0$$

Each fraction $1 - \mathcal{F}_t^0$ workers with $a \geq \bar{a}_t^0$ who stay in the agency experiences the same surplus $V_t^0 - U_t$. Agency surplus per worker in I_t^0 is given by $J(\dot{\omega}_t)$ and this si readily confirmed to have the following structure as:

equation 131

$$J(\dot{\omega}_t) = \max_{\bar{a}_t^0} J(\dot{\omega}_t, \bar{a}_t^0)\,(1 - \mathcal{F}_t^0)$$

Where:

equation 132

$$\tilde{J}(\dot{\omega}_t, \bar{a}_t^0) = \max_{\tilde{v}_t^0} \left\{ (W_t \varsigma_t^0 - \dot{\omega}_t)\varsigma_{0,t} - P_t\, z_t^+ \frac{k}{\varphi} (\tilde{v}_t^0)^{\varphi} + \beta \frac{v_{t+1}}{v_t} (\chi_t^0 + \rho) J_{t+1}^1 (\dot{\omega}_t) \right\}$$

Previous denotes the vaue fo an agency in cohort 0 after endogenous separatiot has taken place. Next, graphically is depicted result in the economy with entrepreneur wealth shock. Simulated are :full model, financial friction model, employment friction model and baseline model.

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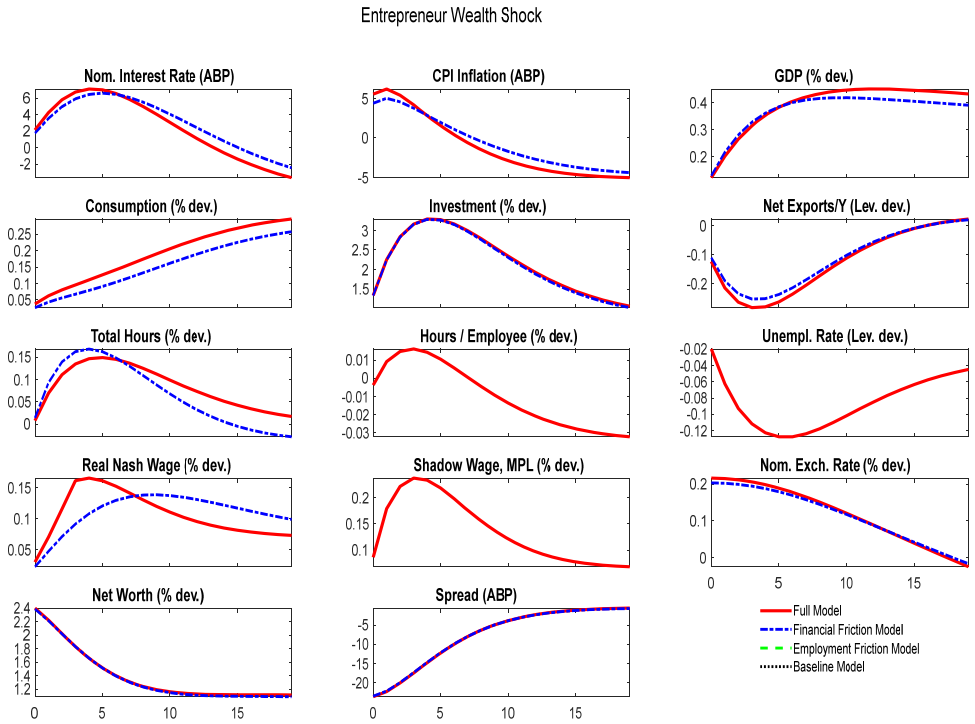
Figure 10 Entrepreneur wealth shock in, full model, baseline economy and financial and unemployment friction economy



Source :Authors' caculation based on DYNARE code : https://faculty.wcas.northwestern.edu/lchrist/course/Korea_2012/CTW.html

Conclusion

The model with savings and consumption shows that savings and consumption policy function can be non-monotonic, and that wealth distribution has right fat tail as in Cagetti and De Nardi (2006). Also, consumption, savings and wealth distribution are affected by the productivity of entrepreneurs which may be low, medium, or high. On the other hand, endogenous entrepreneurship and financial frictions model shows that occupation choice is different for worker or entrepreneur based on productivity: low (worker) or high (entrepreneur) which in turn affects the aggregate wealth of the economy. Also, in this model it is shown that interest rate in the economy is determined by the intersection of total wealth with public and private capital. In the entrepreneurship with financial and labor market frictions model it is shown that entrepreneur wealth shock has different effect on the baseline economy and financial and unemployment friction economy. These models do prove that Financial frictions for capital and unemployment frictions for labor is said to be main drivers of the business cycle dynamics. For the open economy we will have to introduce small open economy setting in the standard New-Keynesian model.

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POSSIBILITIES FOR REALIZATION OF HUMAN RESOURCES AND DEVELOPMENT OF THE LABOR MARKET IN THE NORTH CENTRA REGION OF BULGARIA IN 2022

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ABSTRACT

In 2007, Bulgaria became a member of the European Union. The implementation of various policies related to the regional development of the country has begun. Many of these policies are aimed at the labor market and concern employment, unemployment and raising living standards. However, regional differences in the country persist. This can also be seen in the analysis of one of the six regions in Bulgaria, namely the North Central region and the five districts included in it.

Key words: *Employment, unemployment, regional development, labor market policies*
JEL Classification: 015

INTRODUCTION

The main instrument of the labor market policy in Bulgaria is the national employment action plan, covering the key priorities and activities to which resources are directed to combat unemployment and increase employment. The diverse initiatives in the field of active labor market policies are accompanied by the management of a significant volume of public funds, the effective and efficient use of which is the subject of continuous interest, monitoring, analysis and evaluation both by government bodies and civil society (Dulevski..., 2016, p. 173).

The subject of research is the labor market in the North Central region, the subject of research is the possibilities for the realization of human resources in the North Central region in 2022, and the goal is to analyze the policies, measures and priorities that affect the labor market, employment and the income of the population in this part of Northern Bulgaria. The methods used are theoretical analysis and synthesis, convergent analysis and graphical method.

Exhibition

In connection with the requirements of the EU in the pre-accession period (in 2000), 6 planning regions were identified and formalized in Bulgaria: North-West, North-Central, North-East, South-East, South-Central and South-West.

With the subsequent changes in the country's legislation (new laws on regional development, adopted in 2004 and 2008) and in the EU legal framework (regulations on the requirements for the number of population in the territorial units for statistical purposes NUTS 1, NUTS 2 and NUTS 3) the territorial extent of some of the planning areas was changed. Pleven and Lovech districts were removed from the North Central region and were "transferred" to the North-West region. Their place was filled by the regions of Ruse, Razgrad and Silistra, which until then were part of the North-East region (REGULATION (EC) No. 1059/2003 of the European parliament and of the Council of 26 May 2003 on the establishment of a common classification of territorial units for statistics (NUTS). Thus, the current North Central Region includes 5 districts: Veliko Tarnovo, Gabrovo, Ruse, Razgrad and Silistra (Levkov, 2017).

The area of the region is 14,974 km^2, making up 13.49% of the country's territory. The region borders the Republic of Romania to the north, the Northeast region to the east, the

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Southeast region to the south, and the Northwest region to the west (Fig. 1). The population amounts to 750,795 people, unemployment is 6.9% compared to the national average of 5.3%.

Figure 1: Administrative-territorial structure of Bulgaria, (NUTS Level 2)

Source: NSI

The labor market in the North Central region is examined by the individual areas that are included in it.

Veliko Tarnovo district

According to data from the National Statistical Institute (NSI), the population of the Veliko Tarnovo region in 2021 numbered 226 thousand inhabitants, with a decrease of 10.4% (26.6 thousand people) observed over the last 10 years. The relative share of persons of working age for the Veliko Tarnovo region is 59.1%, with a relative share for the country as a whole of 59.8%. Compared to 2011, the number of persons of working age in the district decreased by 13.5%, and during the period there was also a decrease of persons over working age by 6.3% (Employment…, 2022).

In 2021, Veliko Tarnovo region ranks ninth among all regions in terms of relative share of produced gross added value. The growth of the gross domestic product per capita for the Veliko Tarnovo region is below the average for the country (Fig. 2). According to the level of income (measured by the average wage, BGN 14 545; one euro is equal to BGN 1.96), the district is in nineteenth place among all 28 districts, and the growth of the average wage for 2021 is below the national average. In 2021, about 0.5% of all foreign investments for the country are in the Veliko Tarnovo region (NSI, 2022).

Data from the Labor Force Monitoring show that in terms of the level of economic activity, for the age range 15-64 years (2021), the Veliko Tarnovo district ranks fourth among the districts in the country with an indicator value of 76.4%, which is higher than the national average. The number of employed persons in the area aged 15 to 64 in 2021 was 108.0 thousand, with 5.1% less compared to the same period of 2020. For a period of 1 year, the employment rate for the same age interval decreased by 2.8 p.p. to 75.2% (Employment and unemployment…, 2022).

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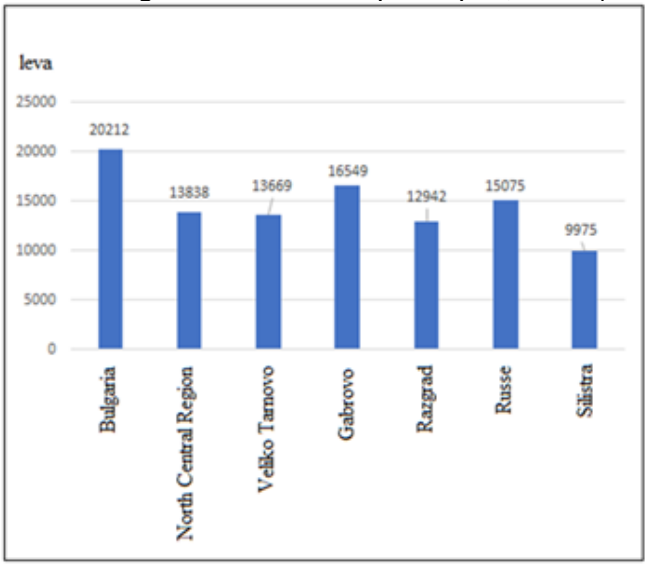
Figure 2: Average annual income per capita, 2021 (in BGN)



Source: NSI, 2022

According to data from the Employment Agency, the number of registered unemployed in the Veliko Tarnovo region at the end of 2021 is 5,331, which is 3% of all persons registered in the labor offices. The number of unemployed people in the district decreased by 2.7 thousand in one year, and in relative terms, the district ranks seventh in terms of negative growth among all districts in the country. The number of unemployed youth under the age of 29 at the end of September was 480, and the district is in twelfth place with the lowest relative share of unemployed youth from the total number of unemployed in the district, which is lower than the average for the country. The number of long-term unemployed persons is 972, and according to the indicator, the lowest relative share of long-term unemployed persons compared to the total number of unemployed, the district ranks twelfth and is below the average relative share for the country. According to a survey of employers' workforce needs conducted in April 2022 - 14.7% of employers in the Veliko Tarnovo region plan to hire new staff, respectively 83.3% of employers do not plan to hire staff, and 1.9 % plan to release workers and employees.

For the period from April 2022 to April 2023, employers from the Veliko Tarnovo region plan to hire about 4,000 specialists with acquired qualifications. Demand will be highest for: garment operators, public transport drivers, garment workers and glass workers. Employers from the region plan to hire about 2.2 thousand specialists with qualifications in professions requiring legal capacity or higher education, including: drivers of international transport vehicles, teachers, lawyers and construction engineers. For the period under consideration, employers will be looking for employment of workers without special qualifications - about 1.4 thousand. When opening new jobs, respectively, the prevailing mode of work will be full-time - 97.6% of all jobs and 2, 4% will be part-time. According to the survey, 53.5% of employers who plan to open new jobs encounter difficulties in finding and hiring workers and employees with the characteristics they need.

In the medium term (after 3-5 years), employers foresee the highest demand for specialists with higher education in the fields of architecture, construction and geodesy, informatics and computer science, mechanical engineering and law. Regarding specialists with a secondary education, the highest demand will be in the field of construction, production technologies - wood, paper, plastics and glass, motor vehicles, ships and aircraft (The Action Plan…, 2022).

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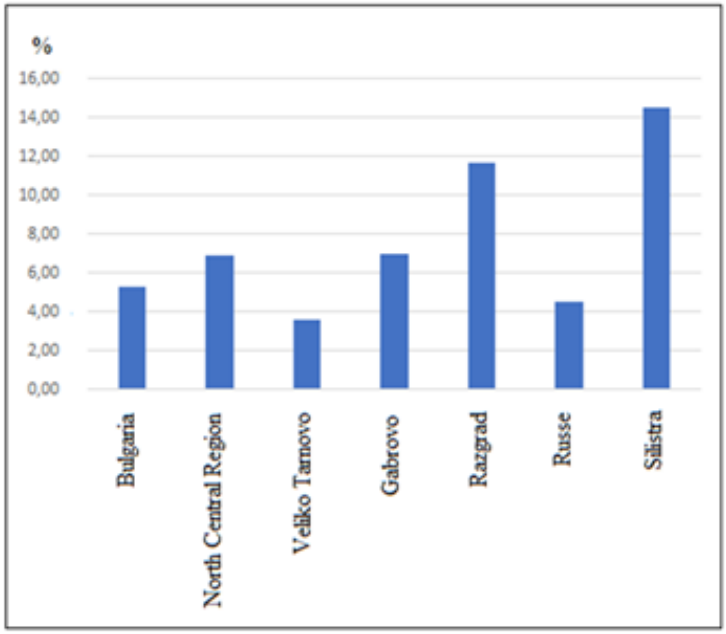
In 2022, the total number of applied jobs in the labor offices in the territory of the district is 7,215, of which 76.8% are in the primary labor market and 23.2% are under programs, measures and schemes for training and/or employment.

Gabrovo district

According to data from the NSI, the population of the Gabrovo region in 2021 will number 103 thousand inhabitants, and for the last 10 years there has been a decrease of 12.9% (15.6 thousand people). The relative share of persons of working age for the Gabrovo region is 55.2%, with a relative share for the country as a whole of 59.8%. Compared to 2011, the number of persons of working age in the district decreased by 15.6%, and for the period there was a decrease of persons over working age by 9.0%. In 2021, the Gabrovo region ranks sixteenth among the regions in terms of the relative share of produced gross value added (GVA). According to the gross domestic product per capita, the Gabrovo region ranks sixth among the regions, with Sofia - city and Sofia - region leading the ranking. Although according to the level of income (the average wage is BGN 15 771) the district is also in one of the leading places, according to the growth of the average wage for 2021, the district is below the national average. In 2021, about 1.3% of all foreign investments for the country are in the Gabrovo region (Employment…, 2022).

Data from the Labor Force Survey (LFS) show that in terms of the level of economic activity, for the age range 15-64 (2021), the Gabrovo region ranks fourteenth with an indicator value of 71.8%. The number of employed persons in the area aged 15 to 64 in 2021 was 40.4 thousand or 3.8% less compared to the same period of 2020. For a period of 1 year, the employment rate for the aged interval decreased by 1.9 pp. up to 64.9%. Gabrovo district has an employment level below the average for the 28 districts of the country (Employment and unemployment…, 2022).

Figure 3. Unemployment rate, 2021 in %



Source: NSI, 2022

According to data from the Employment Agency, the number of registered unemployed in the Gabrovo region at the end of 2021 is 1,710, which is 1.1% of all persons registered in the labor offices. The region has one of the lowest levels of unemployment after Sofia and Varna (Fig. 3). The number of unemployed people in the district decreased by 1.3 thousand

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in one year, and in relative terms, the district ranks third with the highest negative growth after Sofia district. The number of unemployed youth under the age of 29 at the end of September is 179, and the district has values of the relative share of unemployed youth from the total number of unemployed in the district close to the average for the country. The number of long-term unemployed persons is 172, and according to the indicator, the relative share of long-term unemployed persons compared to the total number of unemployed in the district is one of the lowest values for the country. According to a conducted survey of employers' workforce needs in April 2022 - 12.3% of employers in the Gabrovo region plan to hire new staff, respectively 84.3% of employers do not plan to hire staff, and 3.4% plan to release workers and employees.

For the period from April 2022 to April 2023, employers from the Gabrovo region plan to hire about 1.7 thousand specialists in acquired qualifications. The highest demand will be for: machine operators, turners, machinists and welders. Employers from the region plan to hire about 771 thousand specialists with qualifications in professions requiring legal capacity or with higher education, including: mechanical and construction engineers, operators of metal cutting machines, etc. Demand for drivers, dentists and nurses will also be high. For the period under consideration, the demand by employers for hiring workers without special qualifications will be the lowest - about 451 people. When opening new jobs, the predominant mode of work will be full-time - 83.2% of all jobs, respectively 8.4% will be part-time, and "remote" jobs are not foreseen. According to the survey, 91.6% of employers who plan to open new jobs encounter difficulties in finding and hiring workers and employees with the characteristics they need.

In the medium term (after 3-5 years), employers foresee the highest demand for specialists with higher education in the field of engineering, communication and computer technology, as well as administration and management. With regard to specialists with secondary education, the highest demand will be in the field of mechanical engineering, metalworking and metallurgy, electrical and energy engineering, electronics, automation, communication and computer technology, wholesale and retail trade (The Action Plan…, 2022).

In 2022, the total number of jobs applied for in the labor offices in the territory of the district is 2,425, of which 65.6% are in the primary labor market and 34.4% are under training programs, measures and schemes and/ or employment.

Razgrad district

According to NSI data, the population of the Razgrad region in 2021 will number 108 thousand inhabitants, and for the last 10 years a decrease of 11.2% (13.8 thousand people) has been observed. The relative share of persons of working age for the Razgrad region is equal to the relative share for the country as a whole of 59.8%. Compared to 2011, the number of persons of working age in the district decreased by 14% (Employment…, 2022).

In 2021, the Razgrad region ranks among the last regions in terms of the relative share of produced gross added value. According to the gross domestic product per capita, the Razgrad region ranks thirteenth after Sofia - city and Sofia - region. Although according to the level of income (the average wage is BGN 15 517) the district is in eighth place, according to the growth of the average wage for 2021, the district is below the national average. In 2021, Razgrad district together with Silistra district are the two districts in which there are no direct foreign investments (NSI, 2022).

Data from the Labor Force Monitoring show that in terms of the level of economic activity, for the age range 15-64 years (2021), the Razgrad region is in last place with an indicator value of 63.7%. The number of employed persons in the area aged 15 to 64 in 2021 was 38.7 thousand or 7.2% less compared to the same period of 2020. For a period of 1 year, the employment rate for the aged interval decreased by 3.6 pp. to 55.3%. Razgrad district is among the five districts with the lowest level of employment among the 28 districts of the country (Employment and unemployment…, 2022).

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According to data from the Employment Agency, the number of registered unemployed in the Razgrad region at the end of 2021 is 4,095, which is 2.6% of all persons registered in the labor offices. The district has an unemployment rate of 11.7%, which is more than twice the national average. The number of unemployed people in the district decreased by 1.4 thousand in one year, which in relative terms is among the lowest reductions. The number of unemployed youth under the age of 29 at the end of September was 381, and the district is among the districts with a low relative share of unemployed youth from the total number of unemployed in the district. The number of long-term unemployed persons is 1,574, and according to the indicator relative share of long-term unemployed persons to the total number of unemployed, the district ranks among the districts with a high relative share of long-term unemployed persons. According to a conducted survey of employers' workforce needs in April 2022 - 11.3% of employers in the Razgrad region plan to hire new staff, respectively 85.7% of employers do not plan to hire staff, and 2.9% plan to release workers and employees.

For the period from April 2022 to April 2023, employers from the Razgrad region plan to hire about 453 specialists with acquired qualifications. The highest demand will be for: welder and operational accountant. Employers from the district plan to hire about 400 specialists with qualifications in professions requiring legal capacity or with higher education, of whom at most (177) teachers. For the period under consideration, the demand from employers for hiring workers without special qualifications will be the lowest - about 140 persons. When new jobs are opened, the prevailing mode of work will be full-time - 85.5% of all jobs, respectively 14.5% will be part-time. According to the survey, 70.9% of employers who plan to open new jobs face difficulties in finding and hiring workers and employees with the characteristics they need.

In the medium term (after 3-5 years), employers predict that the demand for specialists with higher education in the field of electrical engineering, electronics and automation and mechanical engineering will be the highest. Regarding specialists with secondary education, the demand will be highest in the fields of wholesale and retail trade and motor vehicles, ships and aircraft (The Action Plan…, 2022).

In 2022, the total number of applied jobs in the labor offices in the territory of the district is 2,691, of which 65% are in the primary labor market and 35% are under programs, measures and schemes for training and/or employment.

Ruse district

According to data from the NSI, the population of the Ruse region in 2021 will number 209,000 inhabitants, with a decrease of 9% (21,000 people) observed over the last 10 years. The relative share of persons of working age for the Ruse region is 59.3%, with a relative share for the country as a whole of 59.8%. Compared to 2011, the number of persons of working age in the district decreased by 11.3%, and during the period there was also a decrease of persons over working age by 6.5% (Employment…, 2022).

In 2021, the Ruse region ranks eighth in terms of relative share of produced gross value added (GVA). According to the gross domestic product per capita, the Ruse region ranks ninth. According to the level of income (the average salary is BGN 15 443), the district is in tenth place, and according to the growth of the average salary for 2021, the district is below the national average. In 2020, about 1.7% of all foreign investments for the country are in the Ruse region.

The data from the Labor Force Monitoring (LFM) show that in terms of the level of economic activity, for the age range 15-64 years (2021), the Ruse region ranks fifth with an indicator value of 76%. The number of employed persons in the area aged 15 to 64 in 2021 was 96.4 thousand or 1.6% more compared to the same period in 2020. For a period of 1 year, the employment rate for the age interval was has increased by 2.2 pp. up to 72%, which places the district in sixth place in terms of employment among the 28 districts of the country (Employment and unemployment…, 2022).

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According to data from the Employment Agency, the number of registered unemployed in the Ruse region at the end of 2022 is 4,878, which is 3.1% of all persons registered in the labor offices. The level of unemployment in the district coincides with the average for the country, which places the Ruse district in the eleventh place in terms of unemployment among the districts in the country. The number of unemployed people in the district decreased by 2.8 thousand in one year, and in relative terms, the district ranks eighth in terms of the highest negative growth. The number of unemployed youth under the age of 29 at the end of September is 529, and the district is in sixteenth place in terms of the lowest relative share of unemployed youth out of the total number of unemployed in the district. The number of long-term unemployed persons is 1,607, and according to the indicator, the relative share of long-term unemployed persons in relation to the total number of unemployed persons, the district ranks nineteenth and is above the average relative share for the country. According to a conducted survey of employers' workforce needs in April 2022 - 14.3% of employers in the Ruse region plan to hire new staff, respectively 81.2% of employers do not plan to hire staff, and 4.5% plan to release workers and employees.

For the period from April 2022 to April 2023, employers from the Ruse region plan to hire about 4.5 thousand specialists in acquired qualifications. The highest demand will be for: garment operators, locksmiths, welders, machine operators and dental assistants. Employers from the area plan to hire about 790 specialists with qualifications in professions requiring legal capacity or with higher education, including: nurses, drivers, software specialists and agronomists. Demand will also be high for teachers, mechanical engineers, machine tool operators, educational specialists and psychologists. For the period under consideration, the lowest demand by employers for hiring workers without special qualifications will be around 670. When new jobs are opened, the prevailing mode of work will be full-time - 78% of all jobs, respectively 22 % will be part-time. No “remote” jobs are envisaged. According to the survey, 75.5% of employers who plan to open new jobs face difficulties in finding and hiring workers and employees with the characteristics they need.

In the medium term (after 3-5 years), employers foresee the highest demand for specialists with higher education in the field of mechanical engineering, administration and management, chemical technologies, electrical engineering, electronics and automation, and others. Regarding specialists with secondary education, the highest demand will be in the fields of textile, clothing, footwear and leather production, wood, paper, plastics and glass, mechanical engineering, metalworking and metallurgy, chemical products and technology and construction (The Action Plan…, 2022).

In 2022, the total number of applied jobs in the labor offices in the territory of the district is 6,649, of which 68.9% are in the primary labor market and 31.1% are under training programs, measures and schemes and/ or employment.

Silistra district

According to NSI data, the population of Silistra region in 2021 will number 104.8 thousand inhabitants, and for the last 10 years a decrease of nearly 10% (11.6 thousand persons) has been observed. The relative share of persons of working age for Silistra region is 57.5%, with a relative share for the country as a whole of 59.8%. Compared to 2011, the number of persons of working age in the district decreased by 13.4%, and during the period a decrease was observed in persons under and over working age (Employment…, 2022).

In 2021, only Vidin region has a lower relative share of produced gross value added (GVA) than Silistra region. According to the gross domestic product per capita, Silistra region ranks last. According to the level of income (the average wage is BGN 13 272), the district is in one of the last places (22nd), but according to the increase in the average wage for 2021, the district is above the national average. In 2021, Silistra region is one of the two regions in the country (along with Razgrad) in which there are no foreign investments (NSI, 2022).

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Data from the Labor Force Survey (LFS) show that in terms of the level of economic activity, for the age range 15-64 years (2021), Silistra region ranks twenty-third with an indicator value of 67.8%. The number of employed persons in the area aged 15 to 64 in the second quarter of 2021 was 35.1 thousand or 4.1% less compared to the same period of 2020. For a period of 1 year, the employment rate for the age interval decreased by 1.4 BC. to 53.7%. Silistra District ranks 25th in terms of employment level among the country's 28 districts (Employment and unemployment…, 2022).

According to data from the Employment Agency, the number of registered unemployed in the Silistra region at the end of 2022 is 3,930, which is 2.5% of all persons registered in the labor offices. The region ranks fourth with the highest unemployment rate after Vidin, Montana and Vratsa. The number of unemployed people in the district decreased by 1.4 thousand in one year, and in relative terms the district ranks 21st with the highest negative growth. The number of unemployed youth up to the age of 29 by the end of 2021 is 412, and the relative share of unemployed youth from the total number of unemployed in the district is 0.2 per cent. below the national average. The number of long-term unemployed persons is 1,491, and according to the indicator relative share of long-term unemployed persons to the total number of unemployed, the district ranks 22nd, and Silistra is above the average relative share for the country (NSI, 2022).

According to a conducted survey of employers' workforce needs in April 2022 - 22.3% of employers in the Silistra region plan to hire new staff, respectively 77.7% of employers do not plan to hire staff.

For the period April 2022 - April 2023, employers from the Silistra region plan to hire 634 specialists with acquired qualifications in the following professions: cashier, worker in the food industry, assistant educator, computer systems technician, operational accountant, worker in catering establishments and entertainment, driver of public transport vehicles, baker-confectioner, operator in the food industry. Employers from the area plan to hire about 1.4 thousand specialists with qualifications in professions requiring legal capacity or with higher education, including: drivers, mechanical engineers, machine tool operators, doctors, nurses, forklift operators and teachers. For the period under consideration, there will also be a demand by employers to hire 684 workers without special qualifications. When new jobs are opened, the prevailing mode of work will be full-time - 71.7% of all jobs, respectively 28.3% will be part-time. According to the survey, 71.7% of employers who plan to open new jobs encounter difficulties in finding and hiring workers and employees with the characteristics they need.

In the medium term (after 3-5 years), employers predict that the demand for specialists with higher education in the field of informatics and computer sciences, administration and management, communication and computer technology and electrical engineering, electronics and automation will be the highest. Regarding specialists with secondary education, the demand will be highest in the fields of wholesale and retail trade, food technology, production technology - wood, paper, plastics and glass, motor vehicles, ships and aircraft, mechanical engineering, metalworking and metallurgy, healthcare and sports (The Action Plan…, 2022).

In 2022, the total number of applied jobs in the labor offices in the territory of the district is 3,877, of which 60% are in the primary labor market and 40% are under programs, measures and schemes for training and/or employment.

Conclusion

The regional analysis shows that the North Central region lags behind in its economic development. All five regions are lagging behind in both income levels and the amount of foreign investment. Indicators continue to deteriorate, both demographic and related to the level of unemployment and employment at the regional level. This shows that the labor market needs more effective policies related to its regional development. Overcoming regional differences corresponds to dealing with the challenges of the labor market. Effective policies

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promoting employment transitions are needed, which must be accompanied by well-functioning institutions, with strengthened institutional capacity and the ability to provide, according to specific needs, support to job seekers, including through increased use of digital tools. Taking effective measures in the field of employment in the region under consideration will accelerate its development and contribute to improving the standard of living for the population.

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THE IMPACT OF THE PANDEMIC CRISIS ON CHANGES IN THE MANAGEMENT OF HOSPITALITY BUSINESSES IN SLOVAKIA

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Abstract

The main topic of the paper is the impact of the global pandemic, which arose because of the spread of COVID-19 disease to accommodation and catering facilities in Slovakia. The paper consists of three parts. In the first part of the paper, we define the basic concepts and information related to the studied issue, which were obtained through literary research mainly of foreign Internet sources. In the second part of the thesis, we focus on identifying factors influencing the operation of accommodation and catering facilities during the period of global crisis and proposing solutions to mitigate their impact. We drew attention to the current crisis, which arose because of the outbreak of the global pandemic and the war in Ukraine. Hospitality establishments have been hardest hit by this crisis, so they have also become the subject of our investigation. In the third part of the paper, we present the results of the analysis of primary data obtained through a questionnaire survey from persons in leading positions of accommodation and catering facilities in Slovakia. The research results were processed using mathematical-statistical methods, presented graphically and conclusions and recommendations were drawn from them.

Key words: *Hospitality management. Accommodation facilities. Catering facilities. COVID-19.*
JEL Classification: M21, Z32.

INTRODUCTION

The global pandemic caused by the outbreak of the new disease COVID-19 has affected the operation of the whole world. There are sectors that have been strengthened by this crisis, but there are many sectors that have been damaged. Among the most affected is the hospitality industry, which has been feeling the impact of the pandemic to the greatest extent since it began. Accommodation and catering establishments were forced to adapt to this situation very quickly to keep operations active for as long as possible, see Gallo et. al. (2021). Anti-pandemic measures imposed by the state made it impossible for facilities to operate in proper mode, so these operations were forced to use a crisis plan. Although more than three years have passed since the outbreak of the pandemic, the effects of this crisis are still being felt by tourism establishments. The subject of our research was to identify the main factors that influenced the management and functioning of the examined accommodation and catering facilities during the COVID-19 pandemic.

The host-guest relationship has always existed. Hospitality, which we can name as the ability to offer its guests a certain comfort, originated in the home environment and with the advent of emerging cities acquired the characteristics that we know even in today's form. The first definitions of hospitality touch on the relationship between guest and host, their interactivity, and a mixture of tangible and intangible factors, with the host providing safety and psychological and physiological comfort to the guest, see Baker, Magnini (2016). The hospitality sector, according to book of author Hobbs (2006), includes work in hotels and other accommodation, catering establishments, and work in tourism. A characteristic element of work in this area is to a large extent seasonality, when many facilities need employees who would strengthen the employee base in a specific period – for example, during the summer

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season, winter skiing, etc. Modern hospitality management should also be focused on moving away from typical and traditional tools to meet customer needs, which is due to several influences. According to a study reported by Sukach, Kozlovska, Sushko (2021), successful development of hospitality is not possible without applying modern tools based on the principle of marketing, mainly because of the specific characteristics of this industry. According to Karan (2020), the hospitality industry is the first to decline in times of crisis and the last to recover after the crisis. In some countries, hospitality is the largest employer because it not only meets citizens' daily needs, but it also adds value to lifestyle, nightlife, and tourism. It thus creates a multidimensional impact on the economy, society, and culture, which is the main reason for the domino effect that can be observed at the outbreak of the crisis – the decline of this sector causes major changes in all sectors affected by its existence. The fragility of this environment, according to the data of authors Baker, Magnini (2016), is mainly due to the influence of the human factor, which is very pronounced in this sector. For this reason, it is necessary for companies to incorporate internal marketing into their management, thanks to which the impact of the human factor would be minimized and stabilized, and early education in this area is key to this change. The challenges of attracting, motivating, and retaining a quality workforce are greater in the hospitality sector than in many other service sectors.

Catering facilities can be spoken of as objects and their premises preparing drinks and meals, their subsequent sale and related sale of semi-finished products or goods or services of food nature. In addition to the specific premises of the building where the sale of prepared meals and drinks takes place, premises associated with their preparation, as well as storage or administrative activities necessary for their legal sale are considered hospitality facilities, see Patúš et al. (2011). Catering services also contribute to the development of tourism and are considered an integral part of the stay, while the gastronomic experience can also be the motivation for tourism. Through these services, participants meet subsistence nutritional needs as well as enjoy leisure time when travelling. Catering services consist of serving meals themselves, but an integral part is also a social-entertainment function that complements the overall experience.

According to the data of author Ionel (2017), accommodation is the main service offered by the hospitality unit. Without the accommodation option, the hospitality service would not work. However, it is not only about the possibility of overnight stay, but the buyer also receives benefits such as the environment, safety, or decoration. These services may vary with respect to other devices, but also within a single unit. The offered properties must be found in every tourist establishment, which includes hotels, motels, tourist hostels, inns, campsites, etc. According to study of authors Cser, Ohuchi (2018), establishments that provide predominantly tourist accommodation can be classified in several ways and use different symbols to distinguish them.

Tourism, along with accommodation and catering establishments, must adapt most quickly to market changes. Their success on the market is influenced by many factors, including competition, growth in tourist demand, innovative distribution channels, etc. For tourists to reap the full benefits of these changes, tourism businesses need to adapt their efforts and, in many cases, change their management. This overcoming of new obstacles can also be referred to as crisis management until the business is fully adapted, see Pavia, Floričić (2017).

The official beginning of the COVID-19 pandemic according to Kretchmer (2020) to December 2019, when, according to official information, the first patient became infected with the new virus. Since then, this virus has spread at tremendous speed throughout the world, growing into a global pandemic. Critical global responses to control the spread of the COVID-19 pandemic have included travel restrictions, as most countries imposed partial or total border closures. Subsequently, other global problems began to arise from these measures, as it was travelling Hustle and gastronomy is the main source of revenues in some countries of the world. Carriers, accommodation and catering service providers and various tourist destinations associated with active recreation have suffered from the disruption of mobility. In

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addition to leisure and recreation service providers, other areas also suffered losses, including international trade, much of which comes from coronavirus-infested China. The individual milestones in the evolution of the COVID-19 pandemic are graphically illustrated in following figure 1.

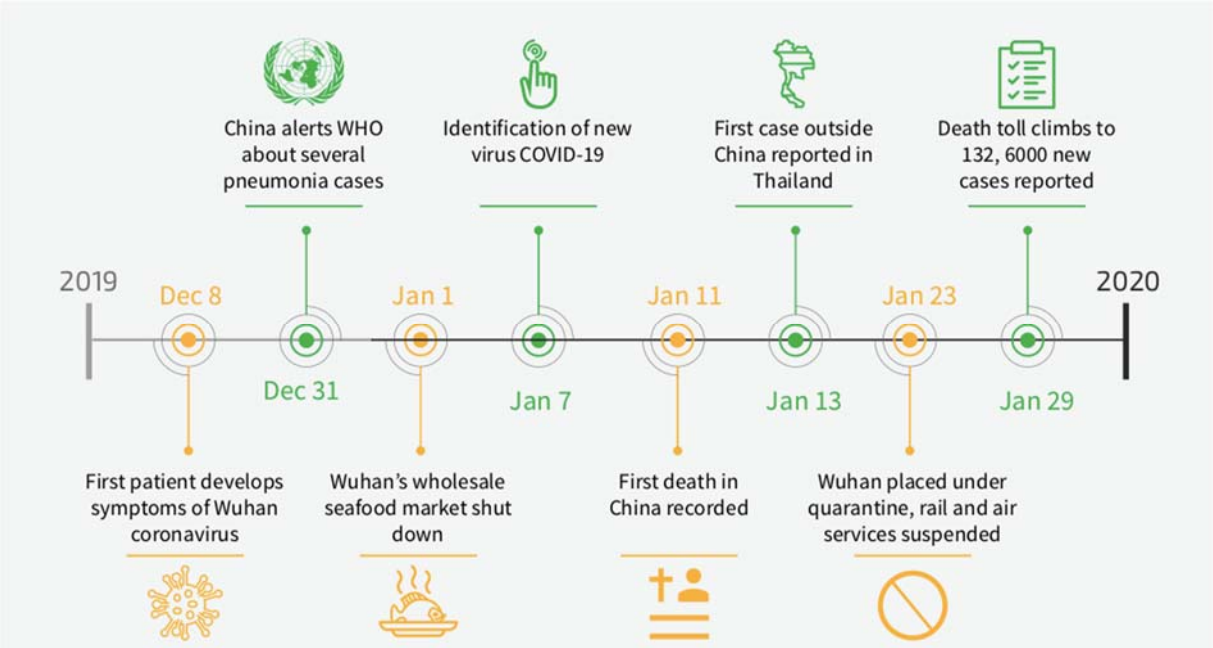

Figure 1: Coronavirus Timeline: The Beginning
(Source: https://spendmatters.com/2020/03/03/as-coronavirus-spreads-vendors-of-supply-risk-management-share-their-insights/)

After what was referred to as a "global lockdown", individual economies had to take responsibility for their own measures and take the pandemic situation into their own hands. The further course of the COVID-19 pandemic has been accompanied by decisions by individual governments that interfere in social and working life. With the increasing obligation to quarantine, the demand for services decreased or approached zero in some phases of the pandemic development, see Džuka, Klučárová, Babinčák (2021). This was also due to the initiative for global distancing, lockdowns, and blockades. The pandemic has also led to unprecedented job and income losses, resulting in millions of jobs and billions of euros in potential job losses, see Dube, Nhamo, Chikodzi (2020).

Measures against COVID-19 in Slovakia changed cyclically according to the current pandemic situation and after the summer period of 2020, when the number of positive cases did not increase daily, anti-pandemic measures were in force to a minimal extent. However, the situation changed rapidly in autumn, when the number of citizens testing positive began to increase again. After a period when hospitality and accommodation establishments were subject to almost no measures, operations were again restricted. New measures introduced before the arrival of 2021 caused the number of guests in accommodation facilities to decrease by up to 94%, which was the second highest situation since April 2020, when the pandemic began to spread widely in Slovakia, see Statistical Office of Slovakia (2023).

In addition to state support, according to Karan (2020), businesses could feel support mainly from business owners, who could aid through postponing or reducing repayments. However, many landlords refused to take this step and operations were therefore forced to operate in difficult conditions to obtain minimal profit. In addition to the negative impact on businesses, this situation also had a negative impact on the safety of employees and customers who visited the establishment in person. Instead of containing the spread of the

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novel coronavirus, the operators themselves supported its expansion in these conditions. At the same time, the situation raised the important question of whether hospitality businesses were ready to sustain and successfully recover from the period of operational discontinuity caused by waves of the outbreak of the pandemic. Businesses had to face a sudden outflow of customers and an inability to generate cash flow from sales, which put them at great risk, see Wieczorek-Kosmala (2021).

MATERIAL AND METHODS

The main aim of the paper is to identify factors influencing the operation of accommodation and catering facilities in Slovakia during the period of global crisis related to the COVID-19 pandemic. The main method of primary data collection was a questionnaire survey. To carry out the questionnaire survey, it was necessary to initially evaluate the number of accommodation and catering facilities operating in the territory of the Slovak Republic and create a representative sample from them, addressing which would subsequently lead to an improvement in the results achieved by the questionnaire survey. 310 facilities operating throughout the territory of the Slovak Republic were contacted.

In the first step, organizations associating hotels and restaurants in Slovakia (e.g., Association of Hotels and Restaurants of Slovakia) were contacted. In the absence of a response, the selection of specific accommodation and catering facilities followed, which was carried out through internet portals gathering their contact details. The facilities were then contacted by email inviting them to fill out a questionnaire. Targeted e-mail communication has proven to be more effective, as a larger number of respondents responded to a direct request. We surveyed respondents for basic information about the devices, as well as the knowledge that the respondents have.

RESULTS AND DISCUSSION

A total of 310 accommodation and catering establishments were interviewed during the data collection period (1 February 2022 to 10 March 2022). Of this amount, 94 respondents responded, which represents an overall success rate of 30.32%. The greatest interaction was observed when communicating with higher-class accommodation facilities – out of the 48 accommodation facilities in classes 4* and 5* surveyed, 23 properties participated in the survey, representing 47.92%. The credibility of the responses was also important in the survey and therefore responses were requested exclusively from those in leadership positions. 53.19% of respondents answered in the position of "General Manager", 15.96% of respondents answered in the position of "Food & Beverage Manager", 27.66% of respondents answered from the position of "Owner" and 3.19% of respondents answered in the position of "Director".

A detailed breakdown of the sample of accommodation facilities can be seen in Table 1. This consisted mainly of accommodation belonging to Class 3* and Class 4*. Within class 1*, a negligible number of accommodation facilities interacted, as this class is the least widespread. We attribute the high response from 4* accommodation facilities to the high level of public relations, as e-mail communication for these establishments is key in attracting potential customers.

Table 1: Breakdown of accommodation facilities by type and class

	Class 5*	**Class 4***	**Class 3***	**Class 2***	**Class 1***
City hotel	1	1	1	0	0
Spa hotel	0	2	2	2	0
Wellness hotel	1	7	4	0	0
Mountain hotel	1	4	3	0	0
Boutique hotel	2	4	0	0	0
Pension	0	0	9	8	2

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∑	5	18	19	10	2

(Source: authors´ processing)

Since the survey was carried out in both accommodation and catering establishments, Table 3 shows the representation of different types of catering establishments, both standalone and those that are part of the accommodation.

Table 2: Distribution of catering establishments by type

Type of catering establishment	Number of devices
Basic catering establishments	16
Complementary catering establishments	6
Social and entertainment establishments	12
Mountain hotel	0
Boutique hotel	2
Pension	4
∑	40

(Source: authors´ processing)

Table 2 shows that the final sample of catering establishments consisted mainly of establishments providing basic catering services and establishments providing social and entertainment services. The mountain hotel had no representation in the survey sample. The number of catering establishments addressed in boutique hotels was also low.

The survey was carried out in the territory of the Slovak Republic. The main indicator here is the unit of territorial division – region. Through the survey with respect to the regions of the Slovak Republic, we can determine the place of operation of accommodation and catering facilities that participated in the survey. These facts can be seen in the following Tables 3 and 4.

Table 3: Overview of accommodation facilities with respect to regions of the Slovak Republic

	City hotels	Spa hotels	Spa hotels	Mountain Hotels	Boutique Hotels	Guest houses	∑
Bratislava region	1	-	3	-	2	2	**8**
Trnava region	-	4	-	-	1	1	**6**
Trenčín region	-	-	-	2	-	1	**3**
Žilina region	-	-	2	2	-	4	**8**
Nitra region	-	-	-	-	-	-	**0**
Banská Bystrica region	1	-	1	-	-	3	**5**
Prešov region	-	1	4	4	1	3	**13**
Košice region	1	1	2	-	2	5	**11**
∑	3	6	12	8	6	19	**54**

(Source: authors´ processing)

Table 4: Overview of catering facilities with respect to regions of the Slovak Republic

	Basic catering establishments	Complementary catering facilities	Social and entertainment facility	Boutique Hotels	Guest houses	∑
Bratislava region	2	-	2	-	1	**5**

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Trnava region	1	1	-	-	-	**2**
Trenčín region	-	1	1	1	-	**3**
Žilina region	1	-	-	-	1	**2**
Nitra region	2	-	1	-	-	**3**
Banská Bystrica region	1	1	1	-	-	**3**
Prešov region	3	-	3	-	1	**7**
Košice region	6	3	4	1	1	**15**
∑	16	6	12	2	4	**40**

(Source: authors´ processing)

After previous data concerning the selection of individual accommodation and catering companies, in the next part of the questionnaire we focused on managerial competencies and their application during the crisis, which we can call the period of a global pandemic. From the theoretical basis of the studied issue, for lasting prosperity the facility must necessarily create a contingency plan that it could use in the event of a crisis, thus minimizing the damage that a potential crisis could cause. These facts were also sweaty in the case of the questionnaire survey carried out, where more than half of the respondents stated that they create a crisis plan during the period of prosperity, which can be seen in the following figure 2.

Figure 2: Breakdown of facilities from the perspective of creating a crisis plan
(*Source:* authors´ processing)

In theory, 52 facilities had a crisis plan ready. We also asked respondents about specific elements of the crisis plan – in this case, to stimulate employees during the period of an active crisis plan. The answers of respondents were repeated several times – employees were stimulated mainly in money during the crisis – in the form of allowances, benefits, bonuses, or payment of full salary during inactive operation. In some cases, employers have taken approaches to create unique conditions for employees. These were mainly reimbursement of stays in various facilities, teambuilding, and motivational programs.

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Employers also consider open communication to be essential in stimulating employees during the crisis, which made it easier to follow up.

A prerequisite for successful management of crisis situations is possession of qualities that are necessary in leadership positions. According to data of authors Paprskárová, Sochanič (2019), these are mainly human skills, which consist of the ability to communicate with co-workers to achieve jointly set goals. On the other hand, conceptual skills are also essential, representing the ability to think comprehensively, foresightedly, and analytically. In the questionnaire survey, we found out which characteristics these are, according to respondents.

In Figure 3 below, we can see that organizational ability is considered by those in leadership positions to be the most important. We can conclude this precisely because as many as 92% of respondents in accommodation facilities stated that organizational ability is most required. For catering establishments, 65% of respondents expressed a positive opinion. The second most important, according to respondents, is leadership. For additional skills, the opinions of those working in hospitality establishments differ. While conflict management is important for those working in accommodation establishments (59.3%), only 32.5% of respondents consider this competence important for catering establishments. A similar contrast can be observed with the competence "analytical thinking", where 45% of respondents answered that this competence is one of the most important in catering establishments. By contrast, only 20.3% of accommodation establishments had this competence.

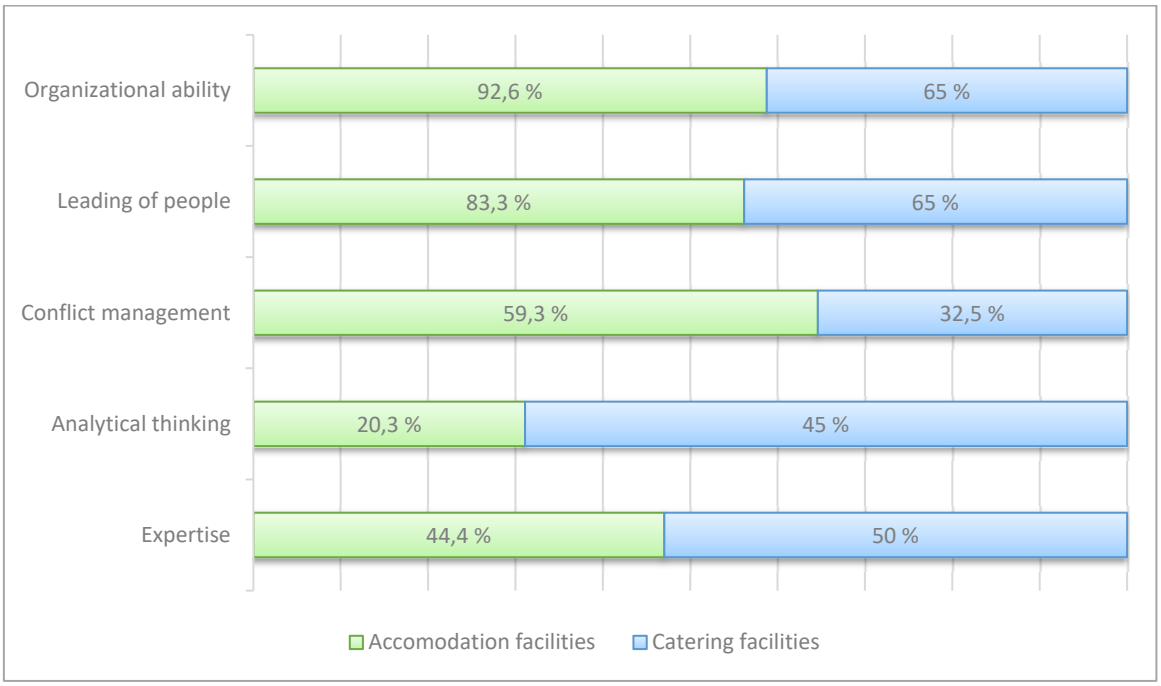

Figure 3: Competences of those holding managerial positions
(Source: authors´ processing)

In the next part of the questionnaire survey, we investigated the connection of theoretical knowledge of managers with their use in practice. To obtain answers, respondents were presented with 5 statements related to managerial knowledge of the hospitality crisis. A 5-step Likert scale was used, which measured the degree of agreement with the statements presented on a scale of 1-strongly disagree, 2-rather disagree, 3-neither-disagree, 4-rather agree, and 5-strongly agree.

For a clearer evaluation of the results, we decided to reduce the responses to those with a positive opinion, a dissenting opinion and those for which respondents could not express themselves.

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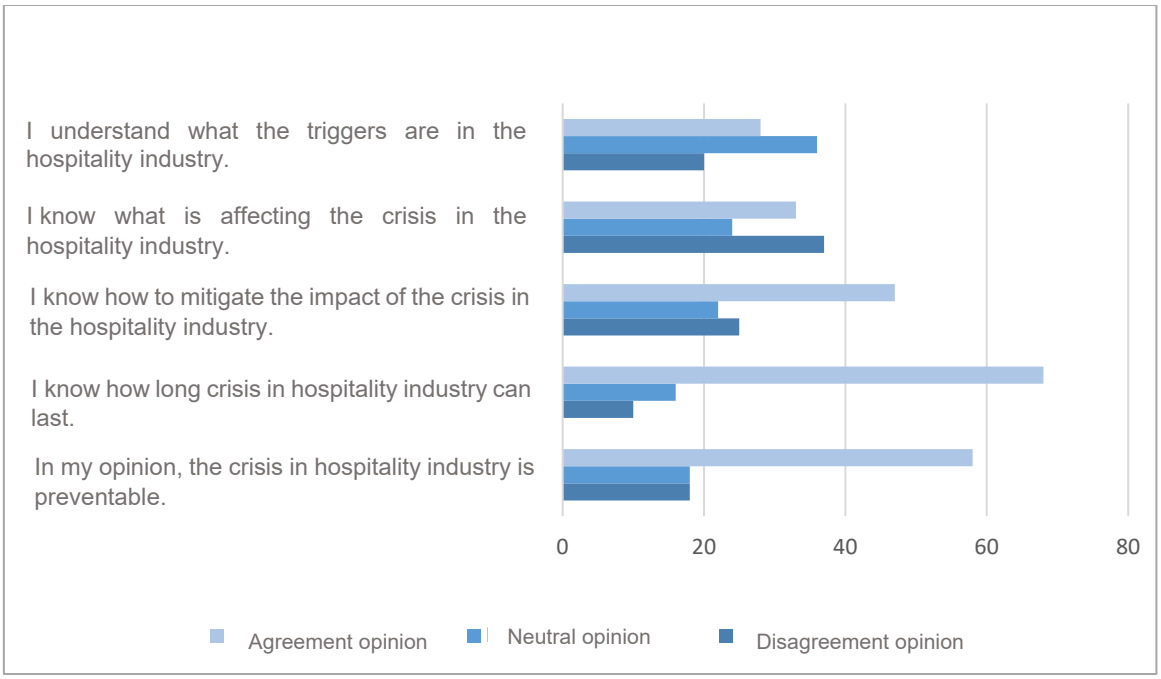

Figure 4: Respondents' views on the crisis in the hospitality industry
(Source: authors´ processing)

Figure 4 shows that a large proportion of respondents understand the emergence of a crisis in the hospitality industry and know how to act in such a situation. As many as 68 respondents out of a total of 94 can estimate the duration of the crisis. Respondents also agreed with the view that the crisis in the hospitality industry could be avoided – the number of respondents with this opinion was as high as 58. When asked about the factors influencing the crisis and mitigating its impact, respondents' opinions differed – 33 respondents answered in favor of the first statement, while as many as 37 respondents answered disapprovingly. 47 respondents answered in favor and 25 out of a total of 94 respondents disagreed. 36 respondents, representing 38.3% of respondents, were indifferent to the statement about the triggers of the hospitality crisis. 20 respondents disagreed, 28 in agreement.

In the questionnaire survey, we also surveyed the specific impacts of the pandemic on accommodation and catering facilities and how the facilities managed to cope with them. We were also interested in the extent to which facilities decided to use the financial assistance provided by the Government of the Slovak Republic as support for facilities that suffered damage due to the global pandemic, such as a decrease in customers, sales, or reduced staffing levels. In the following questions, we asked whether facilities had received this assistance from the state and whether it helped them cope with the impact of the pandemic more easily. 100% of accommodation establishments benefited from this state aid, while catering establishments benefited from this aid only 55%.

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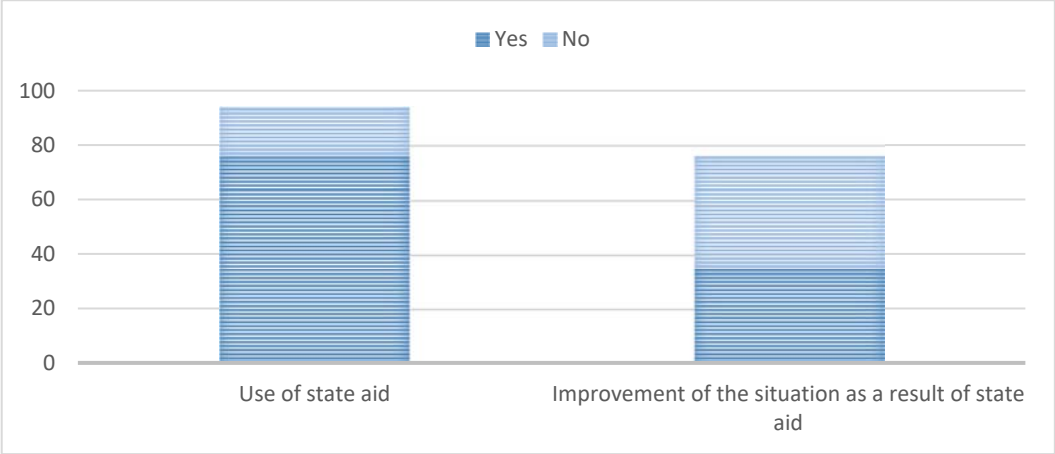

Figure 5: Financial assistance from the state
(Source: authors´ processing)

Figure 5 shows that a large proportion of respondents (80.85%) decided to use state aid. However, only 46% of these respondents say they have seen the positive effects of this assistance. We can talk about specific assistance as contributions that the Government of the Slovak Republic has decided to provide to all facilities that meet certain criteria, such as a percentage decrease in sales compared to previous years or zero debts of the state. The facilities were then able to use these allowances as salaries for employees who were unable to work at the height of the pandemic due to the closure. In certain cases, this contribution could constitute aid that would prevent installations from getting into debt or going bankrupt.

During the height of the pandemic, facilities were forced to find other solutions to help them cope best with this crisis. Through a questionnaire survey, we found out which specific interventions in operation these were. While the most significant changes for catering establishments were the opening of the delivery window (65% of respondents) and the introduction of delivery (55% of respondents), for accommodation establishments it was mainly the change of opening hours (64.8% of respondents). Within the **accommodation facilities**, the changes were not significant, as catering establishments that operate as part of accommodation establishments have been prevented from operating almost since the outbreak of the pandemic. Some establishments responded by adapting and creating a dispensing window within the accommodation, but this brought problems in serving accommodated guests. Among the changes reported by persons in management positions of accommodation facilities were also changes in the form of a virtual receptionist (possibility to stay without direct contact with the accommodation facility's staff), servicing of meals in rooms or limitation of cash payments.

Within **catering establishments**, there have been several changes in the operation of facilities. In addition to the most significant changes mentioned, respondents indicated that they changed the opening hours, ordered online items, limited cash salary, adjusted meal offerings and lowered prices.

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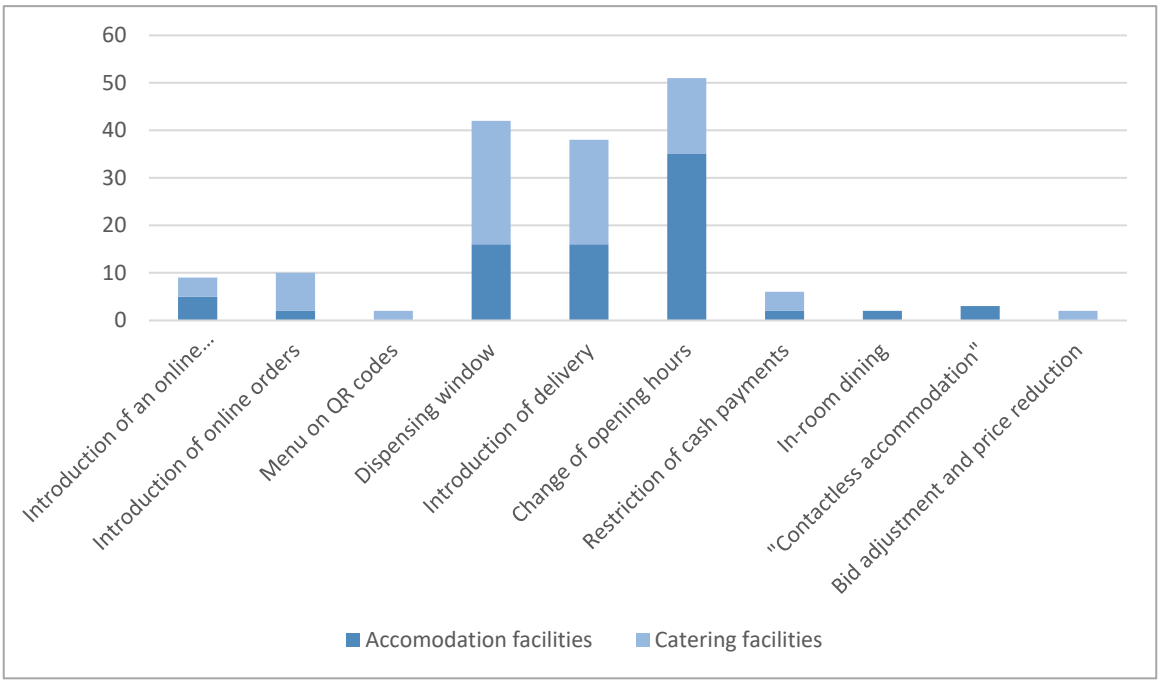

Figure 6: Changes in accommodation and catering operations
(Source: authors´ processing)

The measures put in place by the facilities are mainly related to the global pandemic and adaptation to anti-pandemic measures. Part of our research was also the question of whether any of the measures in place proved so successful that the facility decided to keep it in the future.

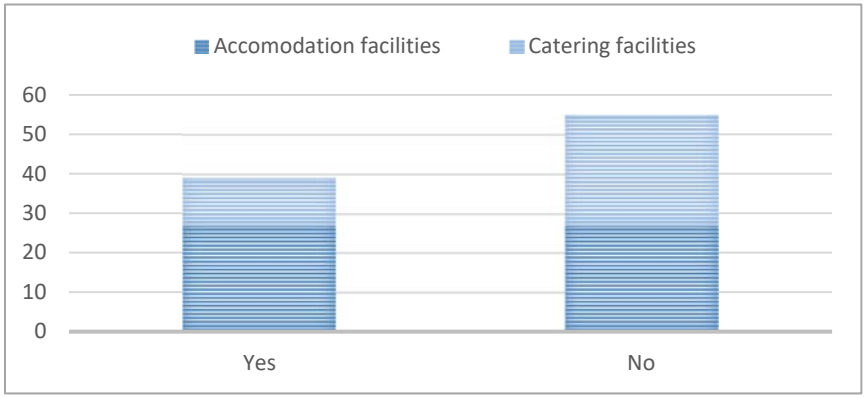

Figure 7: Have any of the measures worked so well that you decided to make them part of the day-to-day business?
(Source: authors´ processing)

Even though a large part of respondents would not keep anti-pandemic changes in the facility, 39 respondents replied that they decided to integrate the measures in place into the normal functioning of the business. These are mainly measures such as delivery, which was absent from the facility until the beginning of the pandemic. Many companies have expanded their field of operation through the introduction of delivery and in this way have had the opportunity to increase their sales.

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CONCLUDING REMARKS

Based on the primary data obtained through a questionnaire survey from directly addressed axis in leading positions of catering and accommodation facilities, which answered questions about their knowledge, coping with the pandemic crisis, or the impact that the facility has to face after this crisis, we found that many respondents (facilities) were already out of operation at the time of the research, which can be attributed to the strong impact of the crisis. In this research, we also found that the hospitality crisis caused by the global pandemic had a huge impact on these establishments. At the same time, the education of the heads of the axis or adaptation to the crisis through the introduction of concrete measures, including the creation of a special crisis plan tailored to the needs of the COVID-19 pandemic, were not enough to mitigate its consequences. It is such a plan when the facility can prepare for a similar crisis and eliminate the consequences of the crisis during its operation. If a person in a leading position decides to prepare such a plan, it is necessary to initially proceed to certain actions, such as:

- environmental analysis,
- true SWOT analysis of the enterprise,
- drawing up a financial plan,
- training of both employees and self-development of a person in a leadership position.

Thus, individual steps help the company to find out in which area the most problems are located and then implement such a crisis plan that will at least partially cover these problems.

Another way of responding to the crisis is for businesses to re-attract customers to use their services. We can assume that by providing accommodation and health services, we meet basic physiological needs of people that never cease to be felt. This is the fact that will keep accommodation and catering facilities in existence. One of the proven ways to communicate to customers the return to traditional service provision is the introduction of bonuses for regular customers (e.g., customers who have used the services of the facility in the past) or the acquisition of new customers who are willing to try facilities they have not visited before after the pandemic crisis. During the crisis period, the facilities could also be used to modernize the offer, thoroughly disinfect the equipment, etc.

Considering the specificity of this situation, which forced the facilities of the hospitality industry to limit their operation for almost two years, we can almost certainly say that consumer behavior has changed over this period. The key for devices now is to capture this "boom" and provide customers with what they are looking for after two years of restrictions. This is mainly about **the number of staff** that has fluctuated the most during these two years. After a period of uncertainty, when facilities were laid off rather than hired, it is important to conscientiously select a workforce that can responsibly approach the coming wave of consumers. The advantage created by this situation is also the possibility to retrain already employed personnel and thus achieve the required level of provided services.

Another key factor is material security and **readiness for a new customer base**. This factor can also be described as communication to customers, as material security indicates the ability of guests to receive and provide them with services at the level, they expect from them. In this way, device owners communicate that they want consumers to choose to use services in their device and are ready to provide them with these services. By implementing these simple features, devices can start normal operations in small steps, which may show greater prosperity than in the pre-global pandemic era. These are elements that should include all devices without distinction, since the essence of consumer behavior has remained unchanged – to use the service as quickly, simply, and as high quality as possible.

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THE LABOR MARKET IN MACEDONIA AND THE REGION – SITUATIONS AND ANALYSIS

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Abstract
The recovery of the economy from the recession caused by the pandemic and the energy crisis brought new challenges, which necessitated the need for targeted fiscal support of the most energy-vulnerable households and companies in the entire Western Balkans. Rising consumer prices, fueled by energy and food prices, have caused a double-digit increase in the minimum wage and inflationary pressures since March 2022. There is a slow improvement in the labor market, but high unemployment requires policy intervention. The reduced growth projection for 2022 to 2.7 percent and the intensification of downside risks require a planned approach to return public finances to a sustainable path, acceleration of human capital development and reforms for competitiveness and the labor market.

Key words: *labor market, employees, employment*
JEL Classification: E24, J21

INTRODUCTION

The coronavirus pandemic (Covid-19) not only caused a health crisis, but also caused human behavior and critical habits, and thus caused changes in the economy. The crisis caused by Covid 19, in the world, but also in the countries in the region, most affected the tourism sector, as well as other sectors related to tourism, ie catering, handicrafts and transport, but also delayed investments in construction and other numerous investment projects in both the public and private sectors.[1] The rapid spread of the Covid 19 coronavirus has disrupted global economic trends. In general, the economic shock caused by the coronavirus affects through two channels: Decrease in the supply of goods and services due to disrupted supply chains and Decrease in demand for goods and services due to increased uncertainty, investment restraint and cautious behavior in consumers.[2] All the countries in the world faced huge consequences for their economies. Factories and shops were closed, and some sectors were particularly affected as a result of the closure of borders.[3]

North Macedonia's economic recovery is expected to lose some momentum in 2022, reflecting a deteriorating external environment, but also weaker domestic demand due to increasing domestic inflationary pressures, and more cautious investment in view of increased international uncertainty and possible supply chain interruptions. Real GDP growth is projected to slow down to 3.0% in 2022, but to accelerate slightly to 3.1% in 2023. Financing needs for continued implementation of anti-crisis measures, in particular to mitigate the impact of high energy prices on households and companies, are likely to entail sustained high fiscal deficit levels.[4]

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[2] Finance Think, Policy Brief no. 39https://www.financethink.mk/wp-content/uploads/2020/11/PB39.pdf
[3] Serafimova, M., Stefanoska., B., 2021
[4] North Macedonia Unemployment Rate - 2022 Data - 2023 Forecast - 1993-2021 Historical (tradingeconomics.com)

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MATERIAL AND METHODS

The materials used in the research are the cited literature and web pages which are focused at labour market in North Macedonia and the region. As the condition of labour market, labour force, employment in the period of coronavirus pandemic (Covid-19) caused not only a health crisis, but also caused changes in the labour economy.

The conceptualization of the labour and workforce market

There is no universally accepted opinion regarding the use of one of the two phrases; however one has to mention the fact that the use of the term "market" does not mean that labour is behaving like another commodity or service. A simple definition of the labour market is given by Derek Bosworth, Peter Dawkins and Thorsten Stromback (1996) who state that the labour market is the place where supply and demand meet, working to determine the price and quantity of the work performed. Michel Didier (1997) defines the market as a means of communication through which sellers and buyers will inform each other about what they have, what they need and the prices that they ask or propose, before closing the transaction. This definition has great applicability on the labour market.

The labour market is the market in which the amount of services that correspond to tasks well established in the job description, are offered for a price or remuneration (Boeri, Van Ours, 2013), that is, to exist on the labour market it is necessary for the work be rewarded.

The labour market must be regulated. In the dictionary of labour law (1997), Beligrădeanu and Stefanescu (1997) define the labour market as "the confrontation between the supply and demand of labour in a given time frame and a geographic area that is usually completed through employment (with an individual employment contract). The worker (employee) means the person exerts his/her activity based on an employment contract in a public or private company or institution, receiving in exchange a payment.

On the labour market, companies act like buyers on the one hand, but also as bidders about regarding to payment, working conditions, and individuals act as sellers, rendering available to employers their knowledge, skills and experience gained. The labour market operates on the principle of competition, the workers competing against each other in view of obtaining or retaining a position. On the other hand, employers compete to attract and maintain within the organizations, the employees that are efficient in the development of the activity and as a result make profit.

Authors like Steliana Pert (1990) or Nita Dobrotă (1997) consider that the labour market is the economic space in which equity holders trade freely, as buyers (the demand), and the owners of the human resource (the supply), as sellers, in which the price mechanism of the work, the real wage, the free competition between economic operators and other specific mechanisms, adjust the labour supply and demand. First and foremost, employees are not an abstract production factor, but human beings with families, desires and needs and only then, labour force (Samuelson, Nordhaus, 2001).

The labour market is one of the main components of the market economy along with the goods and capital market. From an economic perspective the labour market is one of the components of the production forces (Zamfir & Vlăsceanu, 1993).

The workforce was and is the "living" factor that gives meaning to the economic life and is the main component of production factors, by whose direct or indirect intervention, all economic activities become possible. In statistical terms, the workforce is represented by the employed population (those working and those actively seeking work) to which the unemployed are added (Schiller, 1983).

The result of the buying and selling act is represented by the workforce and not the work itself. Work is just a "consequence" of applying the workforce in production (Eatwel et.al., 1987) which is delivered by the worker and bought by the employer.

Among the arguments the authors advocating for the term of workforce market (Adumitrăcesei & Niculescu, 1995) we can state that the human factor, who owns the qualification, experience,

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competence and capacity for working, is the one that constitutes the real object of the transaction and not the salary which is only a means of rewarding the work.
Another argument is that in order to obtain goods and services, employers use the workforce and not the work itself. This workforce is different from person to person, each having an efficiency, productivity and different costs. Moreover, the social protection is performed with respect to the workforce.
It is necessary to distinguish between the work and the individual, that is between what arises from the work process (goods and services) and the individual who possess the skills and knowledge they provide to produce those goods and services.
In specialised literature, the labour market is defined from two different points of view. The first is that the work is like any other good or service through which people sell their labour in exchange for wages while the second appreciates the work as a commodity different from the rest of the goods (goods / services) referring rather to the supply of labour available on the labour market (Hudson, 2000).
In order for the workforce to become a cargo the following conditions must be met (Popescu, 2002):

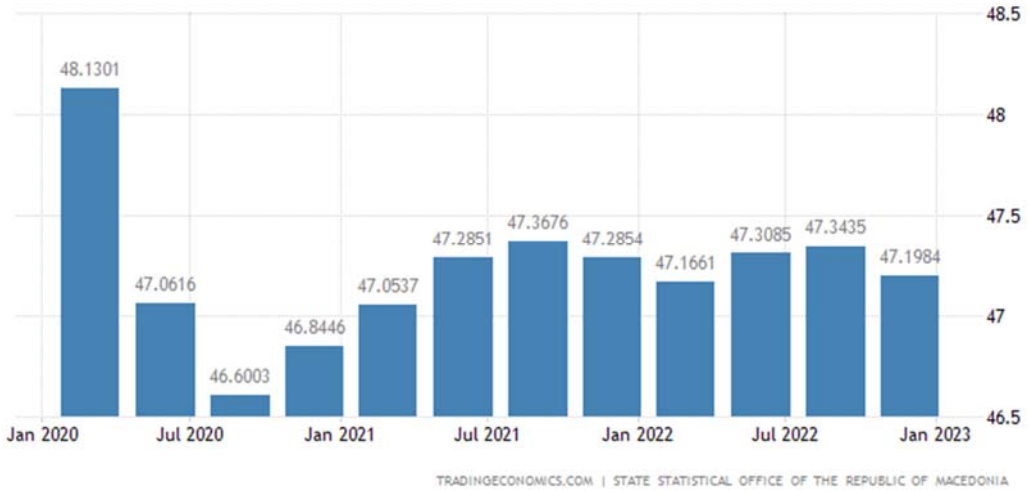
a) the possibility to be changed with another commodity through and exchange contract;
b) giving up the ownership;
c) storing in time.

Given that the three conditions cannot be fulfilled simultaneously, we will not treat labour as a commodity. Although opinions are divided and because there are still many contradictions in using only one of the two definitions, it seems that the term labour market was often used when the human being was considered a factor of production, because the work was seen as another good. But labour is not a commodity as we have argued above, this is an activity performed by individual, and what is capitalised is the workforce.

RESULTS AND DISCUSSION

Employment in North Macedonia

After a moderate employment decline in 2020, the number of employees increased slightly in 2021, in particular in the second half of the year, benefitting from public employment support measures. However, brain drain continues to be an important issue. During the forecast period, employment growth is expected to accelerate, in particular in 2023, reflecting higher investment and government support to employers.[5]



Source: Macedonia Indicators[6]

[5] European Economic Forecast. Spring 2022 (europa.eu)
[6] https://tradingeconomics.com/macedonia/indicators

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The unemployment Rate in North Macedonia decreased further to 14.0 percent in the final three months of 2022, down from 14.3 percent in the previous period. It was the lowest jobless rate on record as the number of unemployed declined by 3.0 thousand to 112.2 thousand and the number of employed was also down by 3.0 thousand to 690.1 thousand. The employment rate edged down to 47.2 percent from 47.3 percent, while the activity rate fell to 54.9 percent from 55.2 percent.[7]

Related	Last	Previous	Unit	Reference
Unemployment Rate	14.00	14.30	percent	Dec 2022
Unemployed Persons	112227.00	115266.00		Dec 2022
Employed Persons	690053.00	693062.00		Dec 2022
Wages	51387.00	49397.00	MKD/Month	Dec 2022
Wages in Manufacturing	46114.00	42963.00	MKD/Month	Dec 2022
Employment Rate	47.20	47.34	percent	Dec 2022
Labor Force Participation Rate	54.87	55.22	percent	Dec 2022
Job Vacancies	10217.00	7873.00		Sep 2022

In Macedonia, the employment rate measures the number of people who have a job as a percentage of the working age population.

Actual	Previous	Highest	Lowest	Dates	Unit	Frequency	
47.20	47.34	48.13	31.20	2004 - 2022	percent	Quarterly	NSA

Source: Macedonia Indicators[8]

Employment in the Region

The region is characterized with constant high level of unemployment, low rate of creating jobs (Kovtun et al., 2014), presence of structural unemployment (Mojsoska-Blazevski, 2012) and generally insufficiently developed institutional framework of labor market (John P. Martin, 2014 in Serafimova, M. Bardarova, S. 2019 pp 4).

Labour market is strengthening and being one of the key factors behind the 2022 economic firming as well as acting as a limiting factor against counter-inflationary measures. Indeed, the unemployment rates returned to a multiple constant trend, with Croatia and Slovenia are at or even below the EU average, while the rest of the region hovered around double-digit levels. Labour demand gained a stronger footing along with strong economic performance, despite unfavorable demographics ie. the reduction in labor supply in many activities also continued to play an important role.

Looking at the details, although North Macedonia has boosted labor market robustness during the pandemic, the unemployment rate is still elevated to 14.4% in Q3 2022. The labour market in Bosnia and Herzegovina recorded two-digit LFS unemployment rate of 14.8% in Q3 2022,

[7] State Statistical Office of the Republic of North Macedonia
[8] www.tradingeconomics.com

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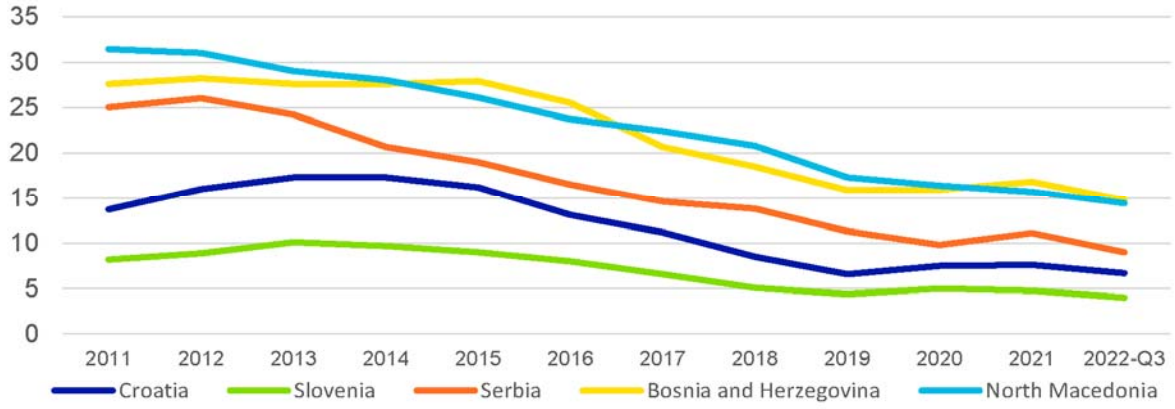
noting the highest gap compared with registered unemployment as informal economy still has a significant role. Serbia recorded unemployment rate of 9%, floating around its bottom hit in Q2. Croatia and Slovenia are at the best performers, with Croatia's rate at 6.7%, while Slovenia hit a record low at 4% in Q3 2022.

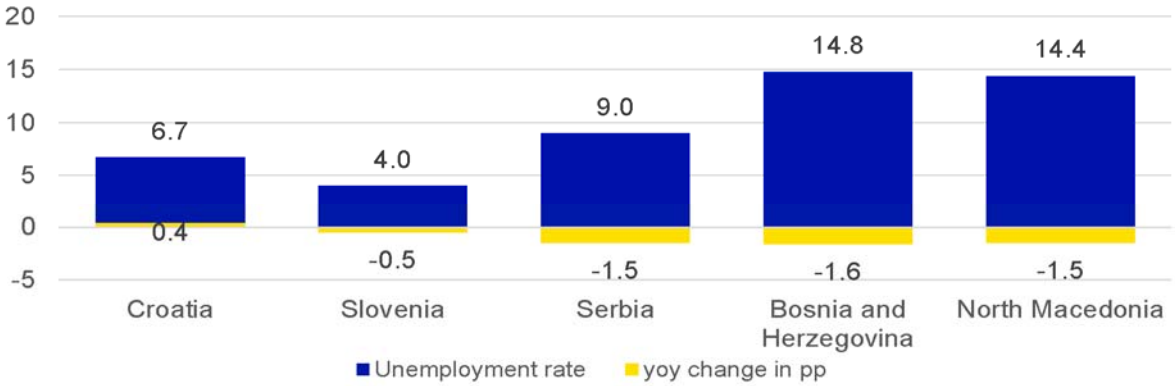
On labour supply, although Bosnia and Herzegovina and Serbia still struggle with high unemployment rates, there is a demand fraction filled with foreign workers (mostly coming from the region and third world countries), dominantly in the blue-collar zone. Scarcity in the labour market in Croatia and Slovenia, which led them to relax their rules for acquiring working permits. Migrations within the region are biased towards Slovenia and Croatia, as relatively higher wages attract jobseekers.[9]

Unemployment rates* sliding down in the recent decade (%)



Source: Eurostat and national statistical offices
Rates according to Labour Force Surveys. The 15-74y age group was used, in case of North Macedonia 15-64y

Unemployment rates* and yoy changes (Q3 2022, %)



Source: Eurostat and national statistical offices
Rates according to Labour Force Surveys. The 15-74y age group was used, in case of North Macedonia 15-64y

Unemployment rates* and yoy changes (Q3 2022, %) Source: Eurostat and national statistical offices Rates according to Labour Force Surveys. The 15-74y age group was used, in case of North Macedonia 15-64y.

[9] https://si.bloombergadria.com/data/files/BBG%20Labour%20market.pdf

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CONCLUDING REMARKS

As the economy gradually recovered from the recession caused by the pandemic, the energy crisis and the war in Ukraine brought new challenges. Support for Covid-19 should be replaced with targeted fiscal support for the most energy-vulnerable households and firms as public debt increases further.

• Consumer price increases accelerated from late 2021, driven by energy and food prices, while a double-digit increase in the minimum wage will add to inflationary pressures from March 2022.

• The labor market is slowly improving, but high youth unemployment requires policy intervention.

• The short-term outlook worsened: the growth projection for 2022 was cut to 2.7 percent, while downside risks intensified. In the medium term, the outlook remains positive, subject to returning public finances to a sustainable path, accelerating human capital development, and green transition and competitiveness reforms.[10]

The National Employment Strategy 2021-2027 with the Employment Action Plan 2021-20232 includes a detailed analysis of the labor market in the Republic of North Macedonia. Although the Strategy identifies differences in the labor market in a regional context, it does not include a specific direct objective to reduce the uneven development of the labor market.[11]

The National Employment Strategy 2021-2027 with the Employment Action Plan 2021-2023 defines three key goals that are interrelated:

(1) General improvement of the quality of the results of learning levels;

(2) strengthening the role of policies for the development of the economy and enterprises in creating decent jobs; and

(3) strengthening the inclusiveness of labor market policies.

The action plan for employment 2021-2023 defines specific activities for achieving the projected results. As for the first objective, it defines measures for accelerating reforms in education and improving the educational infrastructure. Regarding the second objective, the measures are aimed at business entities increasing their efficiency and competitiveness, as well as reducing the informal economy. Finally, in order to strengthen the inclusiveness of the labor market, actions have been defined to reduce the restrictions on the labor market for vulnerable persons and strengthen institutional capacities at the central level in the creation and implementation of labor market policies.[12]

In 2023 we expect the employment in the region rising by around 1%, i.e., at a slower pace compared to 2022, given the growth perspectives (Slovenia and Croatia contracting, with the rest of the region recording some growth) and tight labour market. The inflow of foreign workforce is a must, which pops the issue of market attractiveness, especially in case of non-EU part of the region which has a wider space to improve working conditions. Nearshoring orientation of the dominant EU economies (also mirrored in FDIs inflows in the region) breaks the ground for stable and sustainable growth, conditional on the regions strategic preparedness to form (read import) and manage enough human capital. In general, the labour market in the region has been receiving mixed signals. As employee collectives are gaining advantage, the employers are trying to keep up with increasing overall costs, including labour costs. With FDIs being relatively ample during 2022 it seems that tight labour market is there to stay. The West is craving for workforce luring with high wages, better overall living conditions and widely open doors. In the mid- to long-term the demographics are expected to

[10] North Macedonia Unemployment Rate - 2022 Data - 2023 Forecast - 1993-2021 Historical (tradingeconomics.com).

[11] (strategija_vrabotuvanje_2021_mkd.pdf (mtsp.gov.mk)

[12] chromeextension://efaidnbmnnnibpcajpcglclefindmkaj/viewer.html?pdfurl=https%3A%2F%2Fwww.mtsp.gov.mk%2Fcontent%2Fpdf%2F2021%2Ftrud%2FNSV%25202021-2027%2520i%2520NPV2021-2023.pdf&clen=2190615&chunk=true

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define the employment image. With the degree of emigration recorded in the region, especially within the young age groups, the workforce is expected to shrink further. In addition, the "upside down triangle" shape of the age pyramid suggests the number of people exiting the activity span is significantly higher in comparison to the volume of fresh labour force. In the following periods the unemployment rates will for sure tango with the economic dynamic, with demand leading the way. As cyclical sectors play a major role in the region, expected drop in foreign demand will enter some noise into the labour market on the short run. Considering unemployment rate in 2023, slight increase is expected in Slovenia and Croatia (mostly amid blooming tourist season in 2022 in part due to inflow of Ukrainians, which most possibly won't replay in such volume). As Serbia, Bosnia and Herzegovina and North Macedonia have broader subset of unemployed available, there is a gap for improvement and the unemployment rates are expected to decrease mildly in 2023.

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AIR POLLUTION IN SKOPJE: PRACTICE AND AWARENESS IN THE SCOPE OF HOUSEHOLD HEATING

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Abstract
Air pollution is a concern which poses threat to human health and likewise greatly impacts the ecosystem and the environment. By its broader definition, the air pollution is described as increase in the rate of harmful gases and particles in the atmosphere.

Given that the city of Skopje is on the top of the list of most polluted cities in Europe the aim of this study is to analyze the air pollution in Skopje, particularly focusing the attention on the household heating as one of the major sources of ambient air pollution in the city.

A survey on 242 households was conducted in order to obtain information about the ways of residential heating and the willingness of households to use more environmentally friendly heating technologies. The survey was carried out on the territory of the city of Skopje, as it is the most polluted city in the country. The governmental measures for air pollution abatement in Skopje were reviewed as well.

The results show that most of the households although aware about the emission of harmful particles into air when combusting firewood in old traditional stoves, they still use firewood as it is the cheapest mode of heating. The previous is of particular importance and decisive for the low-income households. It was also observed that the respondents were familiar with the possibility for using wood pellets, as more environmentally heating mode, but there was a lack of information concerning the possibility of governmental subsidizing for replacement of the existing firewood with more modern wood pellets system.
The households that have already started to use wood pellets instead firewood, have increased monthly costs (10 - 15%), but nevertheless they still recommend the use of pellets and pellet stoves due to the efficiency of heating, maintenance, cleanliness, and less pollution of air on the long run.

Summarizing, the choice of heating with firewood is more due to the lower monthly incomes and rational cost planning of the households, and less to the lack of awareness of citizens for utilizing more efficient and more environmentally friendly heating technologies.

Key words: emission, harmful gasses, particles, burning, firewood, wood pellets, household
JEL Classification: Q53, Q59

INTRODUCTION

Air pollution is a concern which poses threat to both, the ecosystem and the environment. By its broader definition it is described as increase in the rate of harmful gases and particles in the atmosphere.

The emission of pollutants into the air originates almost from all economic and social human activities (traffic, industry, combustion and energy installations, biomass/solid fuels burning, and construction activities, landfills for waste and agriculture activities). Burning of firewood for heating and cooking, being used by over 3 million people (Suman et al., 2022), was detected as one of the main causes for air pollution.
The impact of polluted air is most strongly felt in two areas:

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- Human health, by causing negative effects on people's health, especially the children, older people, pregnant women and those with pre-existing health conditions. The health impact of air pollution is primarily due to the influence of PM10 and PM2.5 particles (www.eea.europa.eu)
- Ecosystems, where the air pollution disrupts the growth and yield of vegetation, reproduction and development in the animal world on land and water and generally has a harmful effect on biodiversity (Ministry of Environment and Physical Planning, 2022).

There are a large number of air pollutants. However, the air pollutants with the strongest evidence for adverse health outcomes include particulate matter PM (PM 2.5 and PM10 - particles with aerodynamic diameter up to 2.5 μm and 10 μm, respectively), ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2) and carbon monoxide (CO) (WHO, 2022). The attention of this paper will be focused on the fine particulate matter because it is considered as a pollutant with the largest estimated impacts on mortality and health outcomes. An increase of the concentration of the fine particulate matter above the maximum permitted values seriously affects the human health (WHO, 2016).

According the latest report of World Bank (2022) about 6.4 million people died prematurely world-wide in 2019 as a result of exposure to PM2.5 air pollution. 95% of the deaths have occurred in low-income and middle-income countries, and about 70% of the deaths were observed in East Asia, South Asia and the Pacific. The European Environment Agency (EEA) reported that in Europe in 2020 approximately 275.000 premature deaths were attributable to acute exposure to PM2.5, whereas NO_2 was the cause for about 64.000 premature deaths, and O_3 was linked to 28.000 premature deaths (www.eea.europa.eu, 2022).
Latest data show that, as a result of the different instruments and actions for reducing the PM2.5, there is a trend of improving the air quality in EU27. As a result, the number of premature deaths was lowered for about 45% and if this trend continues with a comparable rate then the zero pollution target set by the Zero Pollution Action Plan (to reduce the number of premature deaths caused by air pollution in the EU by a minimum of 55%, relative to those in 2005) would be achieved before 2030 (www.eea.europa.eu, 2022).

Besides causing less-livable conditions and health problems, the air pollution also imposes a significant economic and social costs. These include the cost to society of premature deaths, the costs of healthcare for the sick due to poor air quality, and the loss of labor productivity associated to the sickness and/or caregiving for oneself or others (Sanchez Martinez et al., 2018). Polluted air reduces worker's cognitive and physical capabilities thus inducing absenteeism at work (www.openknowledge.worldbank.org). It was evaluated that all previously described effects induce reductions in economic output at the aggregate level i.g. 1 $\mu g/m^3$ increase in PM2.5 concentration causes 0.8% reduction in real GDP per capita (OECD, 2019). Hence, significant health gains and cost savings can be achieved through air pollution abatement.

Skopje, the capital of North Macedonia is one of the cities being reported as most polluted in the world and is continuously struggling with poor air quality. The heavy air pollution in Skopje results from the traffic flows, the rapid and intensive urbanization, the activities of industries located in the city, the landfills and the household heating. Additionally, the topography and meteorological conditions, especially during the winter period, also contribute for the increased concentrations of particulate matter in the air.

In this paper, a study for the city of Skopje in terms of air pollution, policy measures for improving the air quality and their implementation by the local population with focus on the household heating will be carried out.

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MATERIAL AND METHODS

The aim of this study is to investigate the air pollution caused by households heating with firewood. Furthermore, an analysis of the public awareness to implement the recommended measures by the government for air pollution abatement was performed.

A desk research for investigating the air pollution in Skopje in a period from 2014 to 2022 was done. Data from the air quality monitoring stations in Skopje (Gazi Baba – urban background, Rectorat – urban traffic, Lisice- suburban industrial, Centar-traffic, Karposh – traffic) were used. Also, the policy measures for reduction of air pollution were reviewed.

In order to obtain information about the modes of residential heating and the willingness of households to use more environmentally friendly heating technologies a survey on 242 households was conducted. Two types of purposive samples were used, the first one referring to the households that use firewood for heating and the second one included households that have changed the heating from firewood to wood pellets. The survey was carried out on the territory of city of Skopje, given that it is on the top of the list of most polluted cities in Europe.

RESULTS AND DICSUSSION

Air pollution in North Macedonia

The latest two reports on the quality of environment in North Macedonia, published by the Ministry of Environment and Physical Planning of North Macedonia (MOEPP) indicate that the PM10 concentrations in the air are high above the EU daily limit of 50mg/m^3 (www.eea.europa.eu, 2021). The main sources of this ambient condition, as noted by the reports, are the residential heating (with a share of TSP[1] emission of 33% in 2017 (MOEPP, 2019) and 39% in 2020 (MOEPP, 2022)), the industry with (a share of TSP of 32% for 2017 and 10% in 2020) and the electricity and heat production sector (25% and 24% in 2017 and 2020 respectively) (Fig. 1).

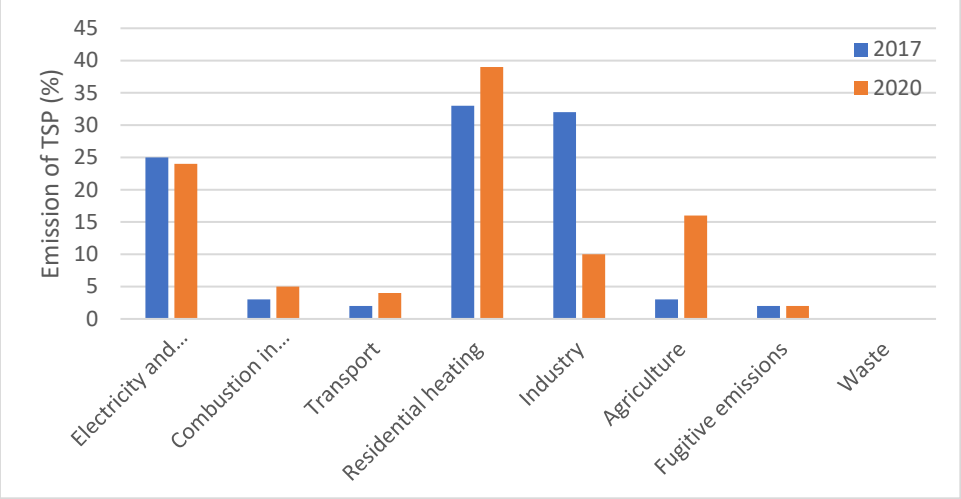

Figure 1. TSP emission by sectors in North Macedonia
Source: Ministry of Environment and Physical Planning (2019). The quality of the environment in the Republic of North Macedonia-Annual report for 2018; Ministry of Environment and Physical Planning (2022). The quality of the environment in the Republic of North Macedonia-Annual report for 2021.

[1]TSP - Total Solid Particles

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According the Census in North Macedonia in 2021 the share of households which are using firewood as primary source for heating is 52.15% (State Statistical Office, 2021), up to 31% of the households are heating with electricity and very few are using central heating and wood pellets (up to 10% for both). Similar observations were noticed for the years before 2021 as well. Namely, about 62% in 2014 (State Statistical Office, 2014) and 49.18% in 2019 (State Statistical Office, 2019) of the households were using firewood as primary heating source (Fig. 2). This state of condition most probably is due to the lack of connections of the residential buildings to the public heating plants and/or the high expenses for heating using electricity sources.

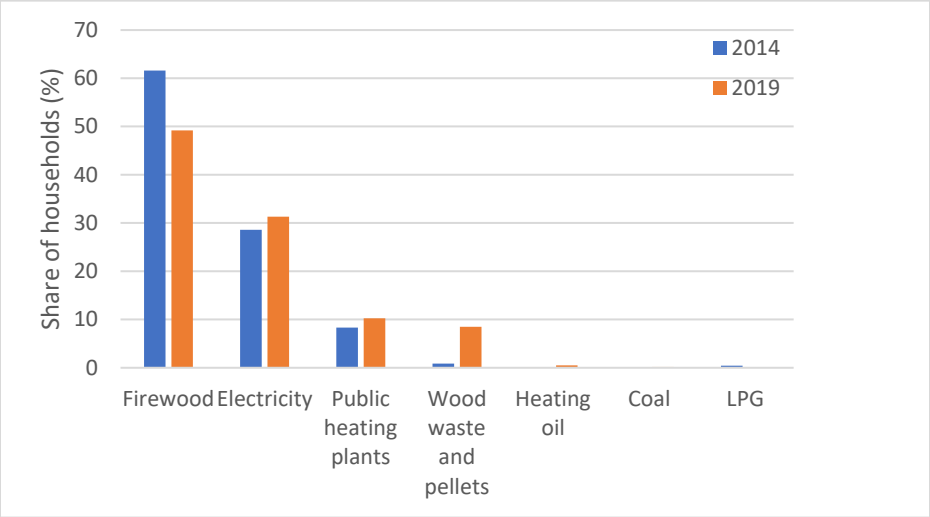

Figure 2. Share of households in the total number of households by primary energy source used for heating
Source: State statistical office (2014). Energy consumption in households; State statistical office (2019). Energy consumption in households.

The analysis of the air quality has shown that about 99% of the estimated emissions of solid PM particles and harmful gases in the air arise exactly from biomass combustion (Finnish Meteorological Institute & MOEPP, 2016) (Tab. 1).

Table 1. Total emission of solid PM particles and harmful gases from the households heating

Heating fuel	Pollutant (tonnes / year)					
	CO	NH_3	NM VOC[2]	NO_x	SO_x	PM
Biomass	10.247	179	1.537	128	28	2.049
Coal	39	0	4	1	8	4
LPG[3]	0	n/a	0	1	2	0
Heavy oil, liquid oil	2	0	0	2	2	0
Total	10.289	179	1.541	132	41	2.053

Source: Finnish Meteorological Institute& Ministry of Environment and Physical Planning (2016). Air quality improvement plan for Skopje agglomeration. EU report.

Although it is well known that biomass in general is renewable source of energy and if it is combusted efficiently it may be almost CO_2 neutral source of energy, the use of wood as residential fuel under non-optimal operating conditions (old non-regulated stoves, stoves lacking proper maintenance, bad burn practices, incomplete combustion) entails negative

[2]NMVOC –Non-methane volatile organic compounds
[3]LPG - Liquefied petroleum gasses

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consequences (Viana et. Al, 2016). Furthermore, some studies have observed that the concentration of harmful substances from wood combustion in the air depends on the type of biomass (firewood or wood pellets), the type of stove (old traditional stoves versus pellet stoves) and the stage of combustion process (initial phase of combustion, full filling of the stove and partial filling of the stove). These observations are presented in Table 2 where the concentrations of gas components (carbon monoxide-CO, nitrogen oxides-NOx, gaseous hydrocarbons-CxHy), and of solid PM10 particles, emitted during different stages of combustion of firewood and wood pellets are given (Schmidl et al, 2011).

Table 2. Average concentrations of emission of harmful gasses and particulate matter from combustion of firewood and wood pellets

Type of biomass	Type of test	Ƞ (%)	CO (mg/m^3)	NOx (mg/m^3)	CxHy (mg/m^3)	PM10 (mg/m^3)
Firewood	SU	88	1046	93	28.3	44.2
	FL		52	145	1.5	20.9
	PL		325	124	5.9	28.1
	Total		***1423***	*362*	*35.7*	***93.2***
Wood pellets	SU	94	178	125	17.1	13.0
	FL		51	128	4.1	12.1
	PL		751	121	24.3	4.6
	Total		***980***	*374*	*45.5*	***29.7***

Ƞ - efficiency coefficient, SU – initial phase of combustion, FL – full filling of the stove, PL – partial filling of the stove

Source: Schmidl C., Luisser, M., Padouvas, E., Lasselsberger, L., Rzaca, M., Ramirez-Santa Cruz, C., Handler, M., Peng, G., Bauer, H., Puxbaum, H. (2011). Particulate and gaseous emissions from manually and automatically fired small scale combustion systems. Atmospheric Environment, 45, 7443-7454.

It can be seen that the total emission of CO and the release of PM10 particles in the air when burning only 1 m^3 of firewood is 45% and 213% more than the emission of these components when burning wood pellets. When the emission of nitrogen oxides and hydrocarbons is concerned, the difference is insignificant, that is, it is 2-4% more when burning wood pellets compared to firewood (Tab. 2). It can be also noticed that the concentration of harmful substances in the air is significantly dependent of the type of stove (Tab. 3) and the combustion stage in the stove (Tab. 2). The results imply that the use of more modern stoves can noticeably reduce emissions of harmful substances, in particular the PM particles.

Table 3. Emission factors of different combustion plants

Type of stove	PM (mg/m^3)	NOx (mg/m^3)	PAH ($\mu g/m^3$)	CO (mg/m^3)	SOx (mg/m^3)
Open fireplace	81.75	2.46	5.96	196.99	0.54
Traditional stove	73.87	2.46	5.96	196.99	0.54
Energy saving stove	36.94	3.94	5.96	196.99	0.54
Pellet boiler	5.91	3.94	0.49	14.77	0.54

Source: Mentes, D., Kovacs, H., Nagy, G., Csaba, P. (2019). Investigation of air pollutants from residential heating. Materials Science and Engineering, 44(2), 44-66.

Taking in account 1) the great number of households that heat with firewood, 2) the significant total annual consumption of firewood in North Macedonia (970.715,00 m^3, i.e. 1.71m3 per household) (State statistical office, 2019) and 3) the significant amount of emitted PM solid particles from firewood combustion, along with 4) the air pollution coming from other sectors,

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the exceeding of the average annual concentration of PM particles in North Macedonia at all measuring points in the country (State statistical office, 2021) is more than obvious.

Economic consequences from the air pollution in North Macedonia

Besides causing less-livable conditions and health problems, the air pollution also imposes a significant economic and social costs. According to the studies for quantifying the economic consequences of health deterioration and premature mortality due to air pollution, about 3800 people per year die in North Macedonia due to air pollution with PM particles (WHO, EU & OECD, 2015). Of these 1700 premature mortalities were caused by polluted outdoor air, whereas 2100 were due to polluted indoor air arising from heating with firewood and other non-ecological fuels. The report of World Bank, the Institute of Public Health of the North Macedonia and the Faculty of Medicine – Skopje (2015) has shown that the pollution with particulate matter causes annual health costs in the amount of 253 million euros, that is, about 3.3% of the gross domestic product (GDP). About 45% of these costs (or around 113 million euros) belong to Skopje. These costs are direct and are closely related to the costs of medicines and medical services, as well as the costs for lost working days (i.e. reduced work capacity of workers) due to absenteeism and the death of 1350 people per year. Furthermore, the study of Meisner (Meisner et al., 2015) has shown that if the concentration of PM10 and PM2.5 is reduced by only 1 μg/m^3, it would lead to savings of 34 million euros per year. The estimated values of potential annual savings as a result of reduction in emission of PM10 and PM2.5 particles are given in Table 4:

Table 4. Potential economic savings associated with reduced emissions of PM particles

Level of reduction in ambient PM10 and PM2.5 (μg/m^3)[a]	Annual health savings (in million euros)
0	0.0
1	34.1
5	98.9
10	133.6
15	161.5
20	184.9
EU standards met[b]	151.5

a - Example reductions were equally applied to both PM10 and PM2.5 at the same time.
b - PM10 = 40 μg/m^3 and PM2.5 = 20 μg/m^3
Source: Meisner C, Gjorgjev D, Tozija F. (2015). Estimating health impacts and economic costs of air pollution in the Republic of Macedonia, SEEJPH 2015

In addition to the direct costs associated with health services, the economic consequences also arise from 1) indirect unrealized costs of premature mortality due to air pollution, i.e. the money that the persons would have spent if they had remained alive, and from 2) lower realized benefit/income ratio for employers due to the loss of the employee. In accordance with the results from the WHO and OECD (2015) the direct and indirect economic consequences in North Macedonia imposed by the premature mortality due to polluted air for 2010 were estimated at about 5 000 000 000 $/ year, i.e. about 20% as a share of GDP. Till 2019 (latest reported data concerning this issue) the annual costs of health damages from PM2.5, although decreased to 15.9% as a share of GDP, they are still high (Tab. 5).

Table 5. Annual cost of health damages from PM2.5, percent equivalent of GDP

	2005	2010	2019
US $ (in millions)	1834	4755	n/a
Percent equivalent of GDP (%)	25.31	19.9	15.9

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Source: WHO & OECD (2015), Economic cost of the health impact of air pollution in Europe: Clean air, health and wealth. Copenhagen: WHO Regional Office for Europe; World Bank (2022). The Global Health Cost of PM2.5 Air Pollution: A Case for Action Beyond 2021. International Development in Focus. Washington, DC: World Bank.

Air pollution in Skopje and measures for its abatement

The attention within this paper is be focused on the fine particulate matter because it is considered as a pollutant with the largest estimated impacts on mortality and health outcomes and is used as indicator for estimating health impacts of ambient air pollution mixture.

The most characteristic feature for the air quality in Skopje is the enormously high concentration of PM10 and PM2.5 solid particles in the air. Data obtained from the State statistical office show that in Skopje the period from 2011 to 2020 the concentration of PM10 has exceeded the 24-hour limit value of 50 μg/m^3, as well as the average annual concentration of 40μg/m^3 at all measuring points in Skopje (State statistical office, 2021). The exceeding mainly occurs during the winter period, as a result of the intensive heating season and the weather conditions. It was shown that major part of the primary PM emissions originate from firewood burned in the households. About 33% of the households in Skopje region use firewood for heating and knowing that the annual consumption of firewood in Skopje region is around 190.000,00 m^3 the air pollution is more than expected and measures should be taken.

In order to mitigate the air pollution from residential heating, especially in the city of Skopje, the Government of North Macedonia has adopted a Plan for improving the air quality in Skopje region (Finnish Meteorological Institute & Ministry of Environment and Physical Planning, 2016). In this plan it is stated that on a long term a replacement of the heating mode of the households from stoves with firewood to usage of gas or another type of fuel is planned, but on a short term the reduction of emission of PM particles is possible through a proper use of stoves and respective fuels, chimney cleaning and increased inspection of the heating systems that use solid fuels. In the same document, several measures are foreseen for all sectors that are responsible for the air pollution and in the text below only those relevant to household heating are listed:

1. A ban on heating with firewood in areas with central heating from public heating plants (Measure 1)
2. Defining areas in which for all newly build objects the connection to the central heating grid will be mandatory (Measure 2)
3. Financial subsidies for replacing the old heating systems that use solid fuel with modern pellet heating systems (Measure 3)

The implementation of Measure 1 would lead to a reduction of the emission of particulate matter in the air. Although low administrative costs for monitoring and enforcing the ban are foreseen, the costs with regard to the households will be larger as they would have to invest in installing a new central heating system. Therefore, the proposed Measure 1 within the Plan for improving the air quality in Skopje region is assessed as expensive. The suggested Measure 2 is also assessed as expensive because its implementation implies upgrade and/or building of new power plants for central heating. It would result in increase of the administrative costs due to increased staff and workload. The households would have increased costs for the installations to the central heating grid. Measure 3 refers to a replacement of old heating systems (wood heating and oil heating) with new heating systems (pellet stoves) with financial subsidies from the City of Skopje. With this measure, by subsidizing the replacement of old systems that emit larger amount of harmful pollutants in the air, with new, more environmental and energy efficient heating systems the citizens are stimulated to use more environmental friendly solid fuels for heating their homes. Hence, the air quality would be improved. Regarding the costs for both, the Government and the households, this proposed measure is

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evaluated as moderately expensive. The households will be exposed to higher costs for buying the wood pellets, whereas the Government will have to allocate funds from the budget for subsiding the households and invest in new employments that will deal with the implementation of this measure.

Taking into account the health consequences, which on the other hand cause significant economic implications, the implementation of the third measure from the Air Quality Improvement Plan for the Skopje region is highly recommended for the citizens of Skopje because although it requires more investments, in the long run the increase in costs is many times smaller than the pollution caused by wood heating (Spirova & Vasiljevic-Shikaleska, 2021). Studies have shown that share of personal experience has more impact on raising awareness about air pollution and its abatement than the media or publicity campaigns (Aydin-Guc, Funda et al., 2018). Therefore, the households in Skopje were investigated in terms of the mode of heating, heated area, region of residence, household income and costs for heating per month. Additionally, the familiarization of the households with the subsides for using modern technologies that cause less air pollution was investigated. The obtained results are given in the text below.

Survey results

Socio-demographic characteristics of the sample

Socio-demographic factors are important predictors of community perception of air pollution. Therefore, information for two categories of households was gathered: households that in major use firewood for heating (Category 1) and households that use pellets for heating (Category 2). The obtained results are presented in Table 6.

It can be observed that in both categories, the age group (42-62) years occurs most frequently, with 49.23% for Category 1 and 58.93 % for Category 2. Most of the households in both categories had monthly income between 30.000 and 45.000 mkd. Furthermore, the households that use firewood are almost equally distributed (10-20%) among the analyzed municipalities except the municipality of Karposh where 32.14% of the households heat with pellets.

Table 6. Sociodemographic characteristics of the respondents

Variables	**n (%)**	
	Category 1	Category 2
	Age group	
21-41	27.69	18.75
42-62	49.23	58.93
63-83	26.15	22.32
	Monthly income	
Up to 30.000,00 mkd	26.92	7.14
30.000,00-45.000,00	46.92	52.68
Above 45.000,00	26.16	40.18
	Residence region	
Aerodrom	10.77	8.93
Gazi Baba	20.00	4.46
Karposh	7.69	32.14
Kisela Voda	17.69	26.79
Gjorche Petrov	11.54	20.54
Butel	16.92	5.36
Shuto Orizari	15.38	1.79

Source: The Authors

Survey of households that in major use firewood as primary heating source (Category 1)

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According the obtained answers most of the surveyed households live in a house (81%) and less in apartments (19%). The households use firewood as a primary source of heating (67.7%), and some of them use heating oil (15.4%) and inverter air conditioner and electric panel heaters (20.8%) (Fig. 3). Only 18% of the households heat all the area in the household, whereas 61% heat 2/3 of the available area (Fig. 4)

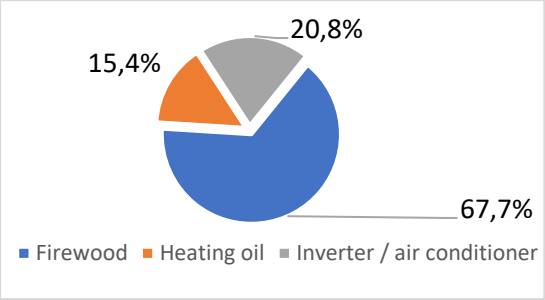

Figure 3. Primary source of heating
Source: The Authors

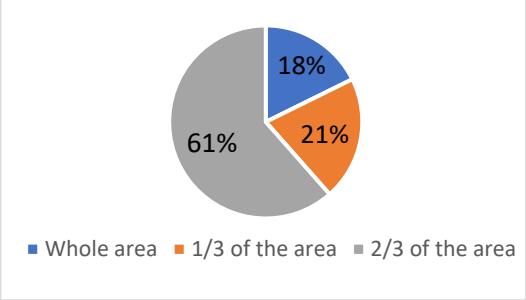

Figure 4. Total area heated in the households
Source: The Authors

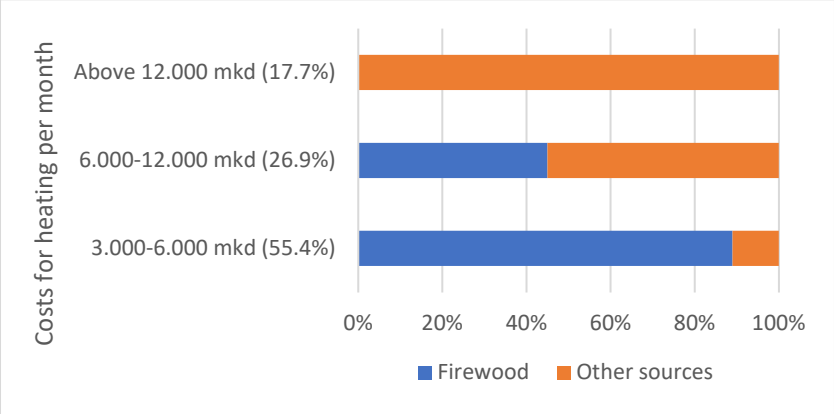

Figure 5. Average monthly costs for heating with firewood
Source: The Authors

With regard to the monthly costs for heating during the winter season it was observed that most households (55.4%) pay from 3000 to 6000 mkd per month for heating. Of them, 89% use only firewood as primary source for heating, where as 11% use additional sources as previously mentioned. 26.9% of the households have a monthly expenses of 9000 to 12000 mkd, in which 45% use only firewood as primary source for heating, and the remaining also use additional heating modes. Only about 17.7% of households have higher monthly costs (above 12000 mkd) and none of these heats the home with firewood. The comparison of results given in Table 6 and Figure 5 indicate that most of the households that have monthly income up to 45.000 mkd, (about 73.84%) have chosen to heat the household using firewood because of its lower monthly costs (up to 6000 mkd).

Concerning the awareness about air pollution, measures and legislative in North Macedonia for reducing the emission of harmful particles in the air the respondents gave the following answers:

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Table 7. Awareness about air pollution and measures for air pollution abatement in North Macedonia

	Aware about the possibility of heating with pellet stoves	Aware about the governmental subsidies for air pollution abatement	Aware about the costs of using pellet stoves	Aware about the environmental benefit of using pellet stoves	Aware about the legislation regarding the air pollution
Yes	61.54 %	37.69 %	54.62 %	55.38 %	25.38 %
No	38.46 %	62.31 %	45.38 %	44.62 %	74.62 %

Source: The Authors

According to the results presented in Table 7, the households that use firewood as a primary source for heating are not well informed about the existing legislative (plans, strategic programs and measures) for reducing air pollution, as well as for the possibility of being subsidized to replace the existing firewood heating system with wood pellets, but they are familiar with the possibility of using pellets instead of firewood and with the costs and usefulness of the same. Despite all, the majority of households (60%) are not willing to use pellet stoves (Fig. 6) because they think that the existing way of heating is more cost effective (65.38%) (Fig. 7). The obtained results imply that the choice of heating with firewood is more due to the lower monthly household income and rational cost planning, and less to lack of information that there is still another way of heating that is more efficient and environmentally acceptable.

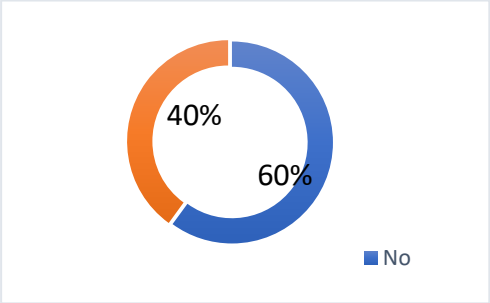

Figure 6. Willingness of changing the heating system from firewood to pellets

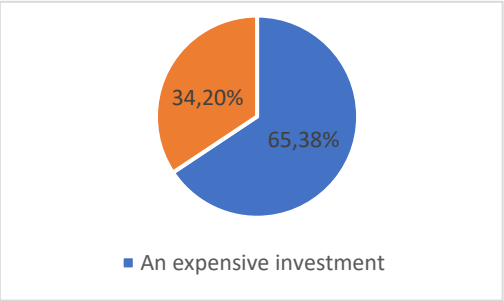

Figure 7. Reasons for not changing the heating system from firewood to pellets

Source: The Authors

Survey of households that have changed the heating system to wood pellets as primary source for heating (Category 2)

The results shown below refer to the surveyed households that have made a shift towards using a heating system with wood pellets. It was noticed that before using the pellets and pellet stoves, more than a half of the respondents (67.86%) were heating their homes with electric appliances (heating panels and air conditioners), whereas the remaining were using firewood (32.14%) (Tab. 8). The most significant decrease of the costs for heating (up to 10% per month) was observed for the households that have previously used panel heaters, whereas for the ones that were previously heating with firewood the costs per month were increased, mostly about 10- 15% per month (Fig. 8).

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Table 8. Information for the households that have changed the heating system to wood pellets as primary source for heating

Heating system used before the use of pellet stove	
Firewood	32.14 %
Panel heaters	42.86 %
Air conditioners	25 %
Procurement of pellet stoves	
With subsidies	7.15 %
Self-financing	92.85 %
By using pellets instead of firewood I contribute positively to reducing air pollution	
Yes	57.14 %
No	9.82 %
No opinion	33.04 %

Source: The Authors

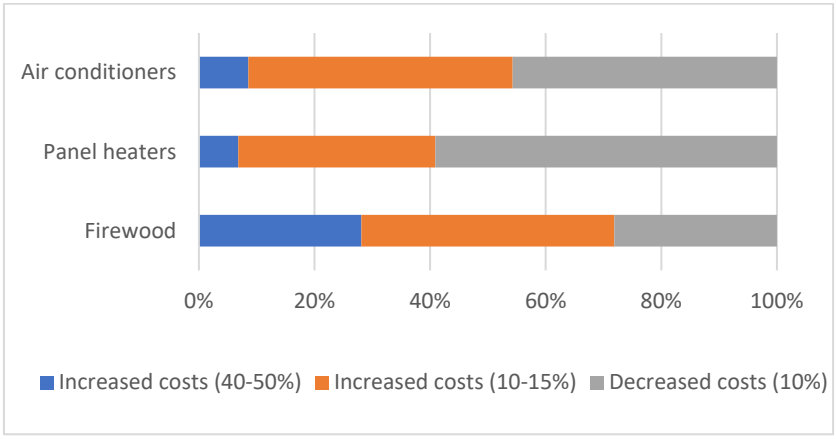

Figure 8. Comparison of the expenses for previous modes of heating with heating with pellet stoves
Source: The Authors

The results obtained for the monthly expenses of the households before and after they have changed the heating system to pellet/pellet stove indicate that the average monthly costs have shifted towards the higher amounts i.g. from average monthly costs of 4.500,00 mkd (most frequent observation on Fig. 5) to 10.500,00 mkd (most frequent observation on Fig. 9). For 35% of households, these monthly costs remained unchanged (Fig. 9).

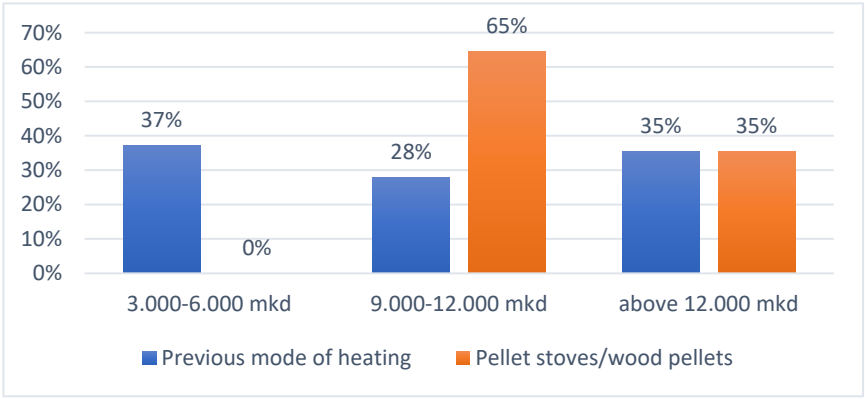

Figure 9. Monthly costs for heating the households using different heating modes
Source: The Authors

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Only 7.15% of the surveyed households used the governmental subsidies (Tab. 8). However, even though the costs were increased, most of the respondents (61.54% of the households that were previously using firewood, 88.89% that were previously heating with panel heaters and 91.89% of those ones heating with air conditioners) have stated that they still recommend the use of pellet stoves for heating the household (Fig. 10) because of its advantages like the maintenance, cleanliness and, above all, higher heating efficiency and less air pollution. They have also stated that by using more environment friendly fuels for heating all of us contribute towards much less polluted air and a more sustainable environment as a whole (from environmental, economic and primarily sociological aspect). The latest should serve as a basis for encouraging the respondents that have no particular opinion about this issue (about 33% of the households that were using firewood for heating-Tab. 8) in terms of more effective exploitation the existing subsidy measures, since it is supposed that it is particularly this group of respondents that have lower monthly incomes.

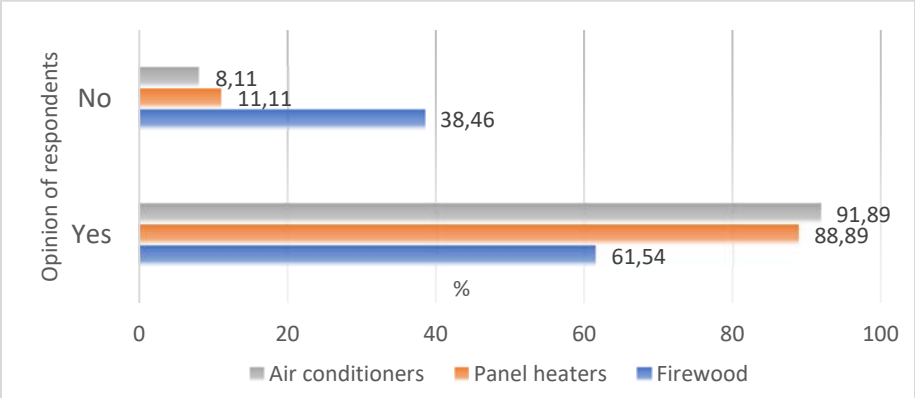

Figure 10. Recommendation (by the households) for using heating system with wood pellets compared to the previous way of heating
Source: The Authors

CONCLUDING REMARKS

The air pollution in Skopje exceeds the air quality limits particularly during the winter period with the residential heating, the industry and the electricity and heat production sector being the biggest emitters of air pollutants. The presence of harmful gasses and particulate matter in the air pose a serious health risk and cause significant economic consequences.

The aim of this research was to study the air pollution in Skopje caused by the households heating, the implementation of the governmental measures for reducing the air pollution in the city and the awareness of the households for using more environmental modes of heating.

Based on the findings it can be concluded that most of the households are aware about the emission of harmful particles into air when combusting firewood in old traditional stoves. They are also familiar with the possibility for using wood pellets, as more environmentally heating mode but there is a lack of information regarding the governmental measures for subsiding the shift from using firewood, burned in old traditional stoves to usage of pellets, with modernized pellet system where the process of burning controlled and is more environmental. As a result, only few of the households (about 7%) have made the shift towards usage of modernized, but above all, environmentally safer pellet heating systems. Although they have increased monthly costs (up to 15%) they still recommend the use of pellet heating system due to the efficiency of heating, maintenance, cleanliness, and less pollution of air on the long run.

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The major part of the households continued to use the firewood as it is the cheapest mode of heating. As expected, the monthly costs for the heating prevail over the usage of more efficient and environmentally friendly heating systems. Therefore, additional subsiding or other kind of support should be provided to the lower-income households so they would be financially sound to change the heating system to a more environmentally one.

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CULTURAL HERITAGE AND SPACE FOR TOURISM DEVELOPMENT IN THE CHURCH "ST. ANNUNCIATION" IN PRILEP

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Abstract

In this paper, we will deal with the cultural heritage and the possibilities for the development of tourism of a Prilep Orthodox church municipality and its temple, which is an expression of the overall living, creation, suffering and constant spiritual and intellectual struggle for the biological, cultural, spiritual and pastoral survival of Macedonians.

This church largely represents an exhaustive historical, psychological, cultural, social and ecclesiastical-spiritual identity, not only in the municipality of Prilep, but also sheds light on the overall events and developments of the Macedonian Orthodox people and their Holy Church.

Historically, we will take a look at all the more important developments in this church, with a special reference to how clinging to great blackmail, they managed to build their first temple in Prilep, during the Ottoman Empire, when temples were converted into mosques, and the people became Islamized with great propaganda.

We will also highlight the role of pilgrim Hristo Damjanov - Logotet, who represents a unique example of a man who had enormous spiritual and intellectual abilities, i.e. a person who manages to cope in every situation and even turns enemies into friends of the church. Considering that such a perceptive person is born rarely, that is why his work is mentioned.

All this information together with the sacred objects in the interior: the icons, the frescoes and the iconostasis made in a cave, we will try to reflect the value of those works, as the main driver of tourism, and also a cultural heritage with a huge history that will be inherited through the generations and it is of great importance both for Prilepčani and for all Macedonians.

Keywords: occasion, woodcarving, spiritual history, historical artefacts, culture

INTRODUCTION

"St. Annunciation" better known as the **Old Church** is located in Prilep. The church was built by the famous Prilep masters Costa Lautso and Riste Taslamice in 1838. The church is 32 m long, 26 m wide and 9 m high. In the courtyard of the church is the grave of the Macedonian revolutionary Pere Toshev.

The initiative to build the church was initiated by respectable persons, potters and craftsmen, who wanted to fulfil the centuries-old desire of the people of Prilepčan for a temple of God. Guilds, especially the tobacco guild, played a major role in obtaining a construction document. The role of the then tobacco merchant - Aji Hristo Damjanov - Logotet was crucial.

He dared to present the wishes of his fellow citizens to the Ottoman authorities. He used his acquaintance with Rushid Pasha to introduce the Sultan to the desire of the people of Prilep to have a church, in which they would sing and worship in their native language. He wrote a petition to the Sultan, asking to build a church. He went to Constantinople first for a meeting with Patriarch Gregory, and then with Rushid Pasha he managed to enter the palace of Sultan's chief secretary. They replied that they should wait for several months. The permit for building the church was obtained in 1835.

A certain grandmother Mita from the Mižovtsi family gave her property, because it was the best place to build the church, and all the guilds agreed to give materials to build the temple

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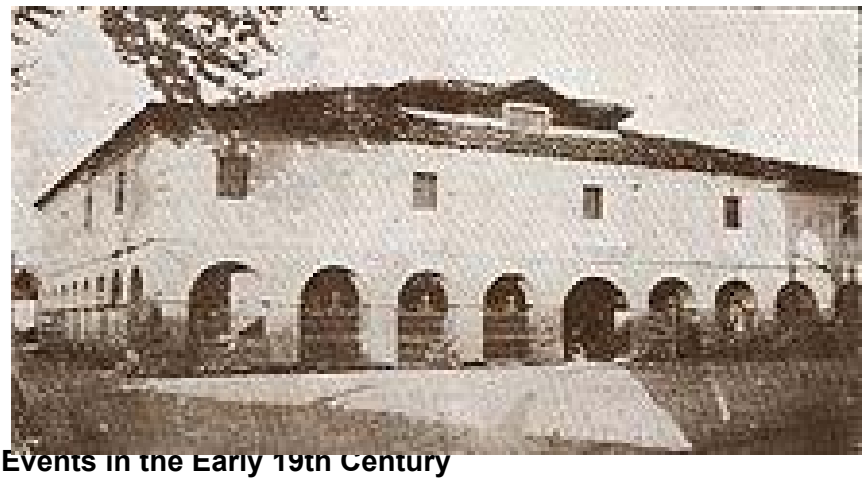
of God faster. The well-known masters Kosta Lautsot and Risto Taslamice were hired, and Damjan Jankulov Renzovski and Kitan Petrov are called their architects.

The people of Prilep decided that the church should be dedicated to him on the "Holy Annunciation" holiday because until then no milder and more beautiful news had arrived in the city. The consecration was performed by Metropolitan Gerasim of Pelagonia. All the priests and almost the whole town attended the act. At the head were Aji Pop Konstantin Dinka, the first bishop vicar in Prilep, and priests Hristo Ikonomovski, Angele Smichkovski, Konstantin Pantov and others served together. The church "St. Good news" is still a spiritual centre for believers and a nursery for priests.



1. Historical Events in the Early 19th Century

The end of the 18th and the beginning of the 19th century is a very characteristic period, both for the Macedonian revival movement and for the awakening of the national and religious feelings of the Macedonians. The Macedonian people welcomed the first decades of the 19th century almost as if they had been forgotten by Europe. The difficult economic and social circumstances and interests were the main reason for the small number of Macedonian intelligentsia and bourgeoisie to start with mass contraction and rebirth. This was because the rare Macedonian intelligentsia had to acquire their education and literacy in Greek high schools. After all, this type of school with a Macedonian sign neither could nor was allowed to exist.

The Macedonian people knew the national feeling, for their Macedonian and Slavic origin, exclusively from the monks, who lived in the Slavic monasteries on Mount Athos, but also from the national clergy, who often knew how to oppose all assimilationist propaganda. However, the influence of the high Greek clergy in Macedonia was at a high level, and their assimilationist policy was successful, first of all, for economic reasons. Not only the cities but also the villages throughout Macedonia were exposed to strong pressure from the Greek bishops and their governors. Their abuses of material resources, as well as corruption, which they carried out in all layers of church and social life, had no end.

Although it was constantly eroded by the religious-national propaganda of the neighbouring countries, the Macedonian people, at the beginning of the 19th century, gathered the strength to start an active church and spiritual life. The construction of magnificent churches in the cities during this period was closely related to the appearance of the first church-school municipalities. The modest economic rise of the Macedonian merchants, as well as the relative understanding and permission of the Turkish authorities to build wider and bigger churches of solid material in Macedonia, contributed to the city churches starting to sprout slowly but surely.

Characteristics of this period are the churches in Bansko (1808), Nevrokop (1811), Bitola (1830), Kruševo (1832), Skopje (1835), Struga (1835), Kratovo (1836), Veles (1836), Prilep

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(1837). and in many other places. The construction of these churches is due, first of all, to the selfless deceptions of the prominent people from the cities - the brewers and the artisan guild, who were also the main initiators and promoters of these ideas.

It must never be forgotten the fact that all these churches were built with the great help of the entire local population, who, not being able to generously and financially support the constructions, were always willing to make their labour available in the more successful and faster building of churches.

Figure 2: The church "Annunciation"

2. The Personality of Pilgrim Hristo Damjanov - Logotet and His Merits for the Cultural Heritage of the Church

Prilep's educational and social activity could only progress through church life's development because the newly emerging Macedonian civil class was increasingly aware of its position and role among its people. That was the reason for that class to be more involved and fit into the more active development of church life.

The butcher-Christian guild was the first to be hit by the Turkish authorities, which limited their rights in trade, so they were forced to open their bazaar in the churchyard. That is why, among the 25 mayors who signed the purchase agreement in 1837, two butchers are also mentioned.

Apart from the Christian butcher's guild, which played an important role in the development of church life, in Prilep in the middle of the 19th century, there were 38 guild associations, which selflessly helped in realizing the idea of developing church life as intensively as possible, but also in organizing the building. of a temple monument, which would satisfy the religious needs of Prilepchan. However, one of the first guilds that grew into a trade guild and that played a decisive role in obtaining the permit for the construction of the church is the tobacco guild. They achieved this key role and responsible task through the then tobacco merchant - pilgrim Hristo Damjanov.

Aji Hristo Damjanov is an eminent person, who dared to express the wishes of his fellow citizens and with skill, ability and tact to achieve his goals before the Ottoman authorities. He was born between 1775-1780 in the village of Belovodica, in the Damjanovci family, and was named after his grandfather. His family was one of the wealthiest in his time.

Sometime before 1826, pilgrim Hristo Damjanov came to Prilep and became the bishop of the church "St. Dimitrij" in Varos. In that period, this church was the central city church, although it was located in Varos, and almost all baptisms, weddings and funerals for Orthodox Christians were performed here. Being the epitope of this church represented a great honour and privilege because the epitope was the supervisor of the material and financial operation of the church and the manager of its property.

After that, he received the royal decree for the construction of today's church of the Holy Annunciation. The location was decided after the famous Midzovci family, i.e., grandmother Mita, without any thought donated the place not only for building the church but also donated a wide area around the church for the construction of a courtyard. Here, all the Prilep guilds donated materials to build the church, and people from nearby places such as Selce and Lenište, who at that time did not have their own churches, joined them, so their joy

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was indescribable.

3. The interior and woodcarving works of art in the church

In the first half of the 19th century, due to the economic rise of the Macedonian citizenry and the relative permissiveness of the Turkish government to build larger and monumental churches of solid material in Macedonia, architecture and painting came to the fore. In the same period, cooperage is also on the rise, and the interior decorations of the churches are particularly prominent.

This was especially evident after the return of the Debar carvers from Sveta Gora, where coppersmithing was developed to perfection. The most famous cobblers of that time were Petre Filipovski - Garkata from the village of Gari and Makarij Frchkovski from the village of Galicnik, who perfected their craft in the workshops of the Italian-Venetian masters. Apart from having learned the craft, these masters, together with their types, knew well the Old and New Testaments, as well as the church canons and rules that apply to the making of iconostases, pulpits, choirs, bishop's chairs and the like. As masters of their craft, they did not allow any of their works to be created spontaneously, but everything was harmonized, measured and masterfully processed.

Adji Hristo decided on such wonderful masters and entrusted them with the difficult and painstaking work of making the iconostasis. The agreement was concluded between the church municipality, headed by the pilgrim, and the tribe of Petre Filipovski - Garkata and his son-in-law Dimitar Stanishev from the village of Gari, Debarsko.

The difference in the characters of the two masters - leaders of their typhes - has a great influence on the beauty of the wood carvings in the church. Petar proved to be a man of broad culture, classy and measured. Most likely, the reason for this attitude of his was the fact that he had opportunities to admire the magnificent surroundings of the big cities, to admire the powerful works scattered around the churches and monasteries and to penetrate the boundaries of the transcendental world, which was known to them as the Christians from the East as well as those from the West. That's why his expression was subtle and filled with refinement.

His son-in-law Dimitrij, on the other hand, was more of a man than the environment in which he grew up - an environment with difficult times, habits and affections, with a deep tradition, with feelings expressed in the rhythm of folk music and ornaments. In the series of framed fields of his creation of the iconostasis, a little rhythmicity is felt, similar to the rhythmicity of the Macedonian folk songs and dances, which followed his ancestors and generations. That's why his strength is in the details and the intertwining of plant life. In the processing of certain worlds, he went almost to naturalism. On the other hand, the other woodcarving works (the bishop's chair, the pulpit and the honorary chair of pilgrim Hristo) were not so strictly fixed, and this allowed him more freedom in his work. Most likely, the bishop's chair is the work of Garkata, and the iconostasis is the work of Stanishev.

Figure 3: Church's Woodcarving Works

In short, the hard-working Kopanicari of Debar created beautiful monumental works about which both pilgrims Hristo and today's Prilep residents speak with reverence and admiration, and every believer, who stands before the iconostasis with a pure and calm heart, has the feeling that he is standing before eternity and has the opportunity to foretaste the beauty of immortality.

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The works that these masters made are still present in the church today and represent a significant historical heritage, as well as the cultural wealth of the Macedonians. This church is also a big driver of tourism for all kinds of people who come from all over to visit this church, to be amazed by the beauty it has to offer, and also to find spiritual peace here.

By presenting these historical facts and data, and capturing the most important elements that the church contains, and there is also a huge part that has not been mentioned, the significance of this church for the historical development of the Macedonian people, as well as for the cultural heritage that the Macedonians they have it throughout the churches.

Figure 4: The church today

4. Preparing and serving food in the dining room of the monastery

Part of this church is the kitchen and dining room, which were built in a new space close to the church. In this facility, dishes are prepared depending on which day the gathering falls on, if it is on Wednesday and Friday then the menu is lean, if it is on other days then fatty food is prepared.

Traditional Macedonian dishes are prepared in the dining room right next to the church, and some of them are the following:

- **Macedonian Pogacha**

Ingredients:

- 4 eggs,
- 1 cup of sour milk,
- 1/2 cup of oil,
- 2 cups of flour,
- 1 bag of pastry,
- 200-250 g cheese,
- 1/2 teaspoon of salt as needed, and little sesame.

Figure 5: Macedonian Pogacha

Eggs are beaten, and then sour milk and oil are added. After mixing well, flour and pastry are added and mixed again. Finally, the crushed cheese is added and sprinkled with sesame seeds. The mixture is placed in a pan and baked at a temperature of 180 - 200 degrees.

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- **Macedonian Makalo**

Ingredients:

- 6 potatoes,
- 20 embroidered dry peppers,
- 2 cloves of garlic,
- 1 tablespoon of salt,
- 200ml of potato water,
- 50ml oil

Figure 6: Macedonian Makalo

Wash the potatoes and peppers well, then put them to boil and soften. The peppers are cut in half lengthwise and the seeds are removed so that only the fleshy part of the pepper remains (you can use a spoon). Put the salt and garlic in a mortar and pound well. Mash the peeled potatoes. Then add the inside of the peppers and the potato water (in which the potatoes and peppers were boiled) and you get a mixture slightly thicker than puree. Heat the oil and steam the potatoes.

CONCLUDING REMARKS

The end of the 18th and the beginning of the 19th century is a very characteristic period, both for the Macedonian revival movement and for the awakening of the national and religious feelings of the Macedonians. This period allows the people to create cultural heritage, create historical wealth for the generations that follow, and to lay the foundations of Macedonia for further tourism and development.

Although the people were enraged by the religious-national propaganda of the neighbouring states, nevertheless, they gathered the strength to start an active church and spiritual life. The construction of magnificent churches in the cities during this period was closely related to the appearance of the first church-school municipalities. The modest economic rise of the Macedonian merchants, as well as the relative understanding and permission of the Turkish authorities to build wider and bigger churches of solid material in Macedonia, contribute to the city churches starting to sprout slowly but surely. The construction of these churches is due, first of all, to the selfless efforts of prominent people from the cities - the butchers and the artisan guild, who were the main initiators and promoters of these ideas.

The Church "Holy Annunciation" possesses a precious treasure of 186 icons, which are registered as monuments of culture. Some of these icons have been transferred to the Institute for the Protection of Cultural Monuments and the Museum in Prilep and they are exhibited in the gallery of icons in the city. Some of those icons were painted by Jovan Atanasov and Adamche Najdov Janov. The church also possesses valuable historical objects, such as, for example, the anti-minus manuscript from 1727, the anti-minus from the Patriarchate of Alexandria from 1730, the Prilep ascetic-instructional collection, the manuscript minuet for the month of September from the 18th century, etc. The church also owns a large number of lithographs, which are recorded and entered in the inventory book of the Institute for the Protection of Culture and the Prilep Museum.

The "Holy Annunciation" church has been a spiritual centre and nursery for the people of Prilep since its construction today. Annually, about 300 new Orthodox Christians are baptized here, about 200 married couples get married, and funerals are performed for about 400 Orthodox Christians.

Today, eight priests and one parish deacon are active here. As a valuable historical monument, according to the proposal of the Institute for the Protection of Cultural Monuments,

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it has been declared a cultural monument and is a place that is regularly visited by numerous domestic and foreign believers, tourists, researchers, historians and art lovers. With the declaration of a cultural monument, it is possible to prepare appropriate scientific research and protection programs, which would have a national mark. In addition, access to scientific and protective research has been made possible, and thus the opportunity to present and publish to the wider Macedonian and world public.

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OPPORTUNITIES FOR DEVELOPMENT OF RELIGIOUS TOURISM AT HOLY SAVIOR - KRUSHEVO MONASTERY IN THE REPUBLIC OF NORTH MACEDONIA

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Abstract

The Church "Ascension of Christ", also called **"Holy Savior"**, is a Macedonian Orthodox church located 2 km (a straight line of distance) southeast of the centre of the town of Krushevo, Macedonia. The Christian temple was built in 1826. This church is located at an altitude of 600 meters. It is one of the biggest tourist attractions of the city of Krushevo.

In the courtyard of the monastery, next to the church itself, there is an old inn with blue doors and windows, which are also characteristic of the Krushevo houses of that period. The guest house also has a high loggia from where you can enjoy the beautiful view of the largest valley in Macedonia - Pelagonia, and from the other side, you can see the beautiful beech forest that changes colours depending on the seasons.

The guesthouse of the monastery has a large number of rooms, where guests have the opportunity to spend the night. More recently, another new guesthouse has been built on the other side of the church, which is of great importance to preserve this piece of historical heritage, so that more people can have the opportunity to come, spend the night and feel the graces of this place.

Keywords: tourism, rural tourism, cultural heritage, historical landmark

INTRODUCTION

The Monastery of Saint Spas, located a few kilometres from Krushevo, is one of the places most visited by tourists in this region. It can be reached when you turn left from the Prilep-Krushevo regional road, near the "Opalenik" industrial zone, and then you have 3 km left to reach it. The monastery and its surroundings have a really impressive history, which is connected with the very formation of the city of Krushevo.

The monastery is a part of well-known monasteries in the Pelagonian planning region, which are part of them: Monastery of the Assumption of the Blessed Virgin Mary-Treskavec, Slepčani Monastery, Monastery of St. Archangel Michael, the monastery of St. Dimitria - village Selce and other monasteries and churches.

The monastery in its landmark brings several glories that guests and local residents have the opportunity to visit. The main glory that is celebrated on Spasoen, that is, 40 days after Easter, that is, on the day of Christ's ascension, from where and what the name of the church comes from. The monastery also celebrates the fifth week of Easter fasting, and the first week of October, where all Macedonian saints are celebrated.

These celebrations are of great importance for the rest of the monastery, because they bring visitors from various places and thus develop the rural tourism of the monastery and the surrounding areas. For these celebrations to be held in that place, the monastery has lodgings with beds that are offered to visitors for sleeping, and there are also kitchens where food is cooked. All this allows for the maintenance of the historical heritage of the monastery and the development of greater rural tourism in the monastery and surrounding areas.

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Figure 1: Monastery St. Spas, Krushevo

1. Historical development of the monastery of St. Salvation

Data on the historical development of the monastery come from the end of the 19th century. The monastery from the 19th century onwards, that is, until its current state.

Figure 2 – Current state of the monastery

The construction of the largest church in this town, dedicated to Saint Nicholas, which was destroyed by the Ottoman army during the Ilinden uprising, is connected with the inhabitants of the village of Stari Dol and their settlement on the territory of today's Krushevo. After that destruction, that church was rebuilt in 1836, which is considered the date of existence of the church that is still in operation today. The church had no painting in this period, only one fresco on the arch of Christ Pantokrator. There is no active monasticism, the last nun who lived here, the nun Cheruvima, died in 1988. The monastery has always served as a refuge for the troops during the Ilinden period, but also during the NOB. Despite the devastation in this region, the monastery of St. Spas remains untouched by any armies, for which there are interesting historical records. Namely, when it was marched towards Krushevo, there were events where the Ottoman soldiers defended the monastery from devastation because of the benefits they had from it, or rather, several children who did not speak after a certain time in the monastery regained their speech. These graces still exist in the monastery today.

Furthermore, during the 19th century, it is noted through documents and sources that there was a large influx of population in this region, which lasted sometimes until 1840. Then, from all the gender regional branches, that is, the Vlachs from Mosko Pole and Gramos and the Macedonians Brsjatsi and Mijatsi choose a delegation that they send to Istanbul to the Jerusalem Valia Ephrem who allows them to buy that land, and where they continue to live, and today that time, that place is known to us as the city of Krushevo, one of the first Macedonian cities. The city experienced a great economic expansion during 1872 and filled a

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large area in today's Western Macedonia as a centre. The Ottoman government forms a nahiya, which is the city of Krushevo with the villages of Selce, Aldanci, Norovo, Trstenik, Birino, Ostriltsi and Rilevo, so that the Muslim administration does not remain in the city, except for the army and the police.

Figure 3 – Current state of the monastery

2. Road infrastructure to the monastery of St. Salvation

If you decide to travel from Skopje to the monastery of St. Rescue by car will take you somewhere around two and a half hours. There are two routes via E75 - the Friendship highway and the regional road (R106) Gradsko-Prilep with a length of 132 kilometres or via the M4 Skopje - Tetovo - Gostivar - Kichevo - Makedonski Brod - Prilep (R513) with a length of 118 kilometers. Prilep is far from St. Spas is about 27 kilometres, and the fastest way to reach it is via the regional road from Prilep to Krivogastani (19.3 kilometres), then you continue 4 kilometres from Krivogastani to the industrial zone "Opalenik", and finally you have 3 kilometres left to go to the monastery.

3. Preparing and serving food in the dining room of the monastery

An inevitable thing in every monastery is the kitchen and dining room. On the day of the monastery's glory, dishes are prepared depending on which day the holiday falls on, if it is on Wednesday and Friday then the menu is lean, if it is on other days then fatty food is prepared. Bearing in mind that the monastery has 3 feasts a year, the dishes that are prepared for each feast are different. For example, the first feast which is Mary Magdalene of Egypt, which is before Easter, is a fasting feast, and therefore fasting dishes of the type are prepared:

- Lenten beans (the recipe dates back to the 18th century, and has not changed at all over the years)

Ingredients:

- 150g Beans
- 1 tablespoon of salt
- 2 tablespoons of salt
- 1 spoon of red pepper

Figure 4: Lenten Beans

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- 2 cloves of garlic

- 1 hot pepper
- 10g black peppercorns
- 3 leaves of fresh mint

- **Lenten Yavnia**

Ingredients:
- 1 onion head
- a few potatoes
- 1 large carrot
- 2 peppers
- 1 medium-sized tomato
- 1-2 cloves of garlic
- salt, red pepper, black pepper
- Parsley to taste.

Figure 5: Lenten Yavnia

When an oily glory is celebrated, the dishes that are prepared are the following:
- Yavnia with veal
- Young roasted veal
We slaughter the lambs that they bring for our health and let them roast, then we bring them back and after the public service, we also distribute roasted lamb (Kolaroski).

CONCLUDING REMARKS

The monastery of St. Spas is the reason why this area is visited every year by numerous tourists and believers from the country and abroad and represents a great potential for the development of religious tourism in the Pelagonian planning region. With its rich history and intact historical heritage, this monastery plays an important role in the development of rural tourism in this region. The monastery lodgings, which carry with them a deep historical tradition, have a great role in overnight stays for visitors. Also, the kitchen that serves food preparation and the dining room make visitors all the conditions needed for a stay.

The cultural heritage, the well-groomed yard and the nature around the monastery on the mountain represent a true paradise for the enjoyment of all tourists who are always delighted. Every domestic and foreign tourist who has visited the monastery is amazed by the peace and deliciously prepared food. The motivation to visit this historical and religious site is primarily from a spiritual aspect, but also from the wonderful experience that this area offers.

Figure 6 – Current state of the monastery

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PROMOTIONAL ACTIVITIES DURING THE TOURIST STAY

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Abstract
The application of promotion in tourism has a special meaning and its specificities. It results from the specificities of tourism, which includes a large number of commercial and non-commercial activities in varying scope and intensity. However, from the economic activities in tourism, catering is the most represented, and within that, the hotel industry with its accommodation recipe. That is the reason that here the emphasis is placed on the practical application of certain promotional activities in these activities, in accordance with their specificities. Quite a significant issue is the promotional aspect of satisfaction and dissatisfaction of visitors during the tourist stay.
Key words: *tourism, hospitality, hospitality, tourism promotion, visitors*
JEL Classification: L83

Introduction

The daily growth of the tourist market and the increasing competition between service providers leads to an increase in the need to create new, recognizable and authentic tourist products that will be attractive to visitors by themselves, and the tourist destination through promotional activities will get a "mark" by which visitors will recognize her in the market. The new methods of formation of tourist supply and demand, creation of a new, flexible and quickly acceptable tourist product is another step towards the movement of tourism forward ie. towards the stage of "new" tourism. This phase involves taking control over the factors that can be influenced. Those factors on the side of the tourist demand indicate a transition from mass to postmodern tourism, during which the transition is made from meeting needs at any cost, to meeting needs that bear the characteristics of a built tourist culture. This means that mass tourism, without clearly defined consumer segments, turns into individual, highly sophisticated tourism with clearly differentiated consumers. According to WTO research, five mega trends in tourism stand out the most: eco-tourism, cultural tourism, thematic tourism, adventure tourism and cruises, which means that there is a modification of the old ones and the creation of new demands of tourists for still "unseen" destinations and " unknown' tourism products. According to the WTO, 37% of international travel involves some form of cultural tourism, and it is predicted that by 2030, this percentage will grow by 15% annually.

1. Theoretical - methodological approach in research

For the efficient implementation of any empirical research, it is necessary to first create a research project. The research project includes several basic phases:

- Determining the purpose and subject of the research;
- Setting up hypotheses;
- Making the sample (selection of the sample);
- Development of methodological instruments for data collection in the field;
- Data collection in the field;
- Data processing;
- Interpretation of the data, i.e. preparation of the study.

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1.1. Objectives of the research

This research has a scientific and practical purpose. The scientific goal refers to certain theoretical knowledge about the promotional activities during the tourist stay, and the practical goal is related to a certain implementation of the theoretical knowledge in practice.

1.1.1. Scientific objective

The scientific objective refers to the discovery of certain theoretical knowledge about the promotional activities during the tourist stay. The scientific goal of this research is to discover new knowledge that if promotional activities are represented in the tourist offer, rapid tourist development will be ensured. Namely, through the method of analysis, by means of a survey with the visitors, we determined the representation of the promotional activities during the tourist stay in the enterprises in the field of tourism.

1.1.2. Practical purpose

This research also has a practical purpose, which is closely related to the scientific purpose. It is related to a specific implementation of theoretical knowledge in practice. The practical goal of the research is to implement the discovered theoretical knowledge for enriching the tourist offer with promotional activities that will contribute to the dynamic development of tourist enterprises, and thus tourism. Accordingly, the practical goal of this research has broad dimensions, as it should mobilize all factors that are directly and indirectly involved in tourism, ie. are interested in this issue.

1.2. Subject of the research

The subject of the research of this paper is the promotional aspect of the satisfaction and dissatisfaction of the visitors during the tourist stay. The subject of this research analyzes three terms that need to be operationalized:

- promotion and
- visitors

1.2.1. Promotion

The very word promotion associates the purpose and content of the activities. It is of Latin origin and means promotion. In this case, it is about the activities aimed at promoting business and business success. In everyday speech, it is also used to denote the ceremony, that is, the way to advance the subject or his work in terms of social recognition. So, for example, we have the promotion of the student to the title "graduate", the doctoral student to the title "doctor", the officer to a higher rank, the scientific or literary work to a socially recognized work, etc. And here the promotion has an identical meaning - advancement. In the first case, it is about communicative activities for the promotion of the activity, and in the others for the promotion of the subject or his work.In economic life, promotion is gaining more and more importance in treatment and application, which is in line with the dynamics of market relations. The modern market is characterized by greater diversification and complexity of supply and demand relations, where communicative activity is increasingly necessary. This need is more emphasized in the tourist market, especially in the tourist-hospitality offer that is characterized by stiffness and static, so the activity of communicating with the market and more broadly with society is even more necessary.

1.2.2. Visitors

Some theorists believe that a true tourist is only one who travels to satisfy a cultural or recreational need. However, there is a category of theorists who advocate a purely economic concept of defining tourism, i.e. that a tourist is any visitor who spends a certain amount of money outside the place of residence, such as: students at various congresses, professional sports competitions where recreation is placed in the second plan, various manifestations, participation in various fairs and trade meetings. In this case, we face the problem of the true

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definition of this term because all the above elements represent consumers, and their stay is not primarily tied to satisfying cultural or recreational needs. It is precisely for this reason that the term visitor was introduced at the United Nations Conference held in Rome in 1963, which was dedicated to international travel and tourism. It represents the definition of the term tourist in the broader sense of the word, that is: "a visitor is any tourist who visits a place and spends a certain amount of money, regardless of the purpose of his visit". On the contrary, "a tourist in the true sense of the word is considered a person who visits a place and spends a certain amount of money, but it is most closely related to satisfying his recreational or cultural need." And this definition is relatively persistent, because in a large number of cases there are situations in which a visitor appears in a double role and can be defined as a tourist in a broader, and at the same time, in a narrower sense of the word. Through the introduction of the term visitor, the work of the statistical services is practically facilitated in monitoring the number of tourists, the character and structure of their visits, etc., for which indicators these services previously had certain problems in their records, which resulted precisely from the inappropriate treatment of this visitor category. By introducing a double definition for the term tourist, i.e. tourist in the narrower and broader sense of the word visitor, the theoretical and empirical requirements of an adequate definition of the increasingly common term and phenomenon - tourist are met. Some authors also mention the term excursionist, which they consider any temporary visitor who stays in a country for less than 24 hours. This interpretation is somewhat inappropriate, because the tourist, despite the fact that his stay may be limited to less than 24 hours, is still a consumer, that is, for that period he can spend one night.

1.3. Hypotheses

One of the most important issues in empirical research is the establishment and verification of hypotheses. "It is a claim that can be put to the test to prove its worth." A hypothesis may appear to be contrary to or consistent with common understanding. It can be proved whether it is correct or incorrect. In any case, it leads to empirical examination. Whatever the result, a hypothesis is a question, posed in such a way that some answer can be obtained. It is an example of an organized skepticism of science, a refusal to accept any claim without empirical verification." Each hypothesis shows the relationship between the independent and dependent variables.

1.3.1. General hypothesis

If promotional activities are represented in the tourist offer, tourist and catering enterprises will work successfully and contribute to the development of tourism.

1.3.1.1. A special hypothesis

The special hypothesis reads: it is assumed that promotional activities are partially represented in the offer of tourist-catering enterprises during the tourist stay.

1.4. Research methods and organization

1.4.1. Research methods

When researching social phenomena, general and special methods are used. "All social sciences, in addition to general methods, apply and use special and specific methods that are appropriate for collecting data in the respective field." Hence, this research is also based on a certain methodology. When processing the data obtained from the research, we applied the method of analysis and the method of synthesis.

1.4.1.1. Method of analysis

The term "analysis" comes from the Greek word >>analysis<< which means the breakdown of a whole into its component parts. Therefore, disaggregation is a fundamental feature of the analysis method. In fact, dissection means dividing a complex object into parts of which it consists in order to perceive their qualities, determine the quality of the complex object and

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indicate their effect on it. Namely, on the tabulated data, we applied a breakdown of their content and gave an explicit explanation.

1.4.1.2. Synthesis method

The synthesis method is a procedure of scientific research and explanation of reality by way of synthesis of simple judgments into more complex ones. Synthesis is a process of generalization in which all more abstract concepts arise compared to previous concepts. Synthesis is a way of systematizing knowledge according to the legality of formal logic, as a process of creating theoretical knowledge in the direction from the particular to the general, that is, from species to genus. All findings obtained through the method of analysis, by applying the method of synthesis, we translated them into conclusions from which we further gave recommendations for improving the promotional activities in the tourist offer.

1.4.2. Methodological techniques of research

In the defined research subject, we used the following as methodological techniques:

- survey
- scaling method and
- statistical method.

1.4.2.1. Survey

We applied the survey to visitors in several enterprises in the field of tourism, randomly selected. It aimed to get a clear idea of their views, regarding the representation of promotional activities in the tourist offer.

1.4.2.2. Scaling method

This method is used to obtain data from multiple questions in a survey. We applied the scaling to activate the possibilities for the representation of the promotional activities in the tourist offer. During the formulation of the degrees, the statistical processing of the data was taken into account, which was the next step.

1.4.2.3. Statistical method

In this research, this method was applied because it achieves greater accuracy in the study of phenomena. In doing so, we used the following statistical technique: calculation of percentages and calculation of statistical significance X^2 (XI - square). The statistical processing of the data was performed by computer.

1.4.2.4. Sample making and selection

During the creation and selection of the sample, its representativeness was taken into account. The representativeness depends on the size and the method of obtaining it. The sample size depends on the number of respondents taken for the study. Moreover, the sample should contain at least 100 members of the population so that reliable statistical conclusions can be made. In that context, 150 domestic and foreign visitors are included in this research by means of a survey.

1.4.2.5. Realization of the research

This phase of the research had an operational character. The research was carried out in the period from June 2021 to September 2021 in a larger number of enterprises in the field of tourism. We found full understanding and help from the management team of the tourist companies.

2. Analysis of the obtained research data

This part is the most important part of the paper and is actually the final stage of the research. As we pointed out, using the analysis method, we also analyzed the empirical data obtained

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from the survey of visitors in several tourist enterprises, after systematizing them, tabulating them, determining the number of respondents, calculating a percentage according to the number of respondents and calculating statistical significance X^2 (XI - square).

2.1. Respondents' views on the representation of promotional activities in the tourist offer

As we pointed out earlier, the foundation of this research is the analysis of the empirical data obtained from the survey of visitors in several tourist enterprises, after we systematized them, tabulated them, determined the number of respondents, calculated a percentage according to the number of respondents and calculated statistical significance X^2 (*ХИ* - square). In that connotation, we applied a breakdown of their content to the tabulated data, and based on the respondents' answers, and gave a precise explanation. Therefore, the special hypothesis reads: "it is assumed that the promotional activities are partially represented in the offer of tourist - hospitality enterprises during the tourist stay.".

In Table 1, the views of the respondents on the representation of promotional activities in the offer of tourism and catering enterprises, according to whether they are domestic or foreign visitors, and which were realized through a survey, are presented:

Table 1. The views of the respondents on the representation of promotional activities in the offer of tourist and catering enterprises according to whether they are domestic or foreign visitors

A Serial Number	Do you think that the promotional activities in the offer of the tourist - catering company are represented?				
	Respondents according to whether they are domestic or foreign	Yes	Partially	No	Total:
1.	Homemade	9 (11,25%)	71 (88,75%)	-	80 (100,00%)
2.	Foreign	14 (20,00%)	51 (72,86%)	5 (7,14%)	70 (100,00%)
Total:		23 (15,33%)	122 (81,33%)	5 (3,34%)	150 (100,00%)

Based on the analysis of the data in table 1, which refer to the views of the respondents on the representation of promotional activities in the offer of the tourist-catering company according to whether they are domestic and foreign visitors, two tendencies are characteristic. The first tendency refers to domestic respondents. The second tendency refers to foreign respondents and the total number of respondents. Namely, the first tendency refers to the attitudes of domestic respondents. As a matter of fact, the largest number of them pointed out that the promotional activities are partially represented in the offer of the tourist-catering enterprise (88.75%). In second place are the views of the respondents who pointed out that promotional activities are partially represented in the offer of the tourist-catering enterprise with a percentage of 11.25. While none of the respondents from the domestic visitors pointed out that the promotional activities are not represented in the offer of the tourist-catering enterprise in the offer of the tourist-catering enterprise.

The second refers to the attitudes of foreign respondents to the total number of respondents. In fact, according to the second tendency, to the question in the survey: "Do you think that promotional activities are represented in the offer of the tourist-catering enterprise?", the

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largest number of foreign respondents or 72.86% and the total number of respondents or 81.33% pointed out that promotional activities are partially represented in the offer of the tourist-catering enterprise. In second place are the views of the respondents that promotional activities are represented in the offer of the tourist - catering company, among foreign visitors with 20.00%, and among the total number of respondents with 15.33%. And in third place are the views of the respondents who pointed out that promotional activities are not represented in the offer of the tourist-catering company, among foreign respondents with 7.14%, while among the total number of respondents with 3.34%. The differences in the responses of domestic and foreign respondents, based on the calculated X^2 (XI - square), are statistically significant at the 0.01% level.

According to the answers of the respondents, we can conclude that the visitors emphasized that the promotional activities are partially represented in the offer of the tourist-catering enterprise.

Findings, conclusions and proposals

The topic that is dealt with in this paper is "Promotional activities during the tourist stay". The fact of the great importance of promotional activities during the tourist stay was the motivation for processing this topic. It is also worth noting that there is a small amount of research in this area, within our space, so it should continue to be studied from a scientific and practical point of view, considering its actuality.

Tourist goals refer to promotional activities during the tourist stay. According to the conducted research, and based on the analysis of the data presented in table 1, we came to certain conclusions. Namely, based on the analysis of the data in table 1, which refer to the views of the respondents on the representation of promotional activities in the offer of the tourist-catering company according to whether they are domestic and foreign visitors, two tendencies are characteristic. The first tendency refers to domestic respondents. The second tendency refers to foreign respondents and the total number of respondents. Namely, the first tendency refers to the attitudes of domestic respondents. As a matter of fact, the largest number of them pointed out that the promotional activities are partially represented in the offer of the tourist-catering enterprise (88.75%). In second place are the views of the respondents who pointed out that promotional activities are partially represented in the offer of the tourist-catering enterprise with a percentage of 11.25. While none of the respondents from the domestic visitors pointed out that the promotional activities are not represented in the offer of the tourist-catering enterprise in the offer of the tourist-catering enterprise.

The second refers to the attitudes of foreign respondents to the total number of respondents. In fact, according to the second tendency, to the question in the survey: "Do you think that promotional activities are represented in the offer of the tourist-catering enterprise?", the largest number of foreign respondents or 72.86% and the total number of respondents or 81.33% pointed out that promotional activities are partially represented in the offer of the tourist-catering enterprise. In second place are the views of the respondents that promotional activities are represented in the offer of the tourist - catering company, among foreign visitors with 20.00%, and among the total number of respondents with 15.33%. And in third place are the views of the respondents who pointed out that promotional activities are not represented in the offer of the tourist-catering company, among foreign respondents with 7.14%, while among the total number of respondents with 3.34%. The differences in the responses of domestic and foreign respondents, based on the calculated X^2 (XI - square), are statistically significant at the 0.01% level.

Based on the findings, we can draw the following conclusion:

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- promotional activities are partially represented in the offer of the tourist-catering enterprise and
- to overcome the unfavorable conditions in which the tourism economy of R. Macedonia it is necessary:
- to take all necessary measures by the tourist managers and employees to fully implement the promotional activities during the tourist stay and
- to create a unique tourist product that will be different from the competition.

Unfortunately, we come to the conclusion that not enough attention is paid to this problem in the tourism and catering companies in our country, and it is high time to make fundamental changes in the attitudes of managers and employees who are involved in tourism and catering towards full implementation of promotional activities during the tourist stay. Only in that way R. Macedonia will get closer to developed tourist countries.

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"BIBLICAL MACEDONIA" - TOURIST CHALLENGE

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Abstract

The term Macedonia is one of the oldest historical terms. Macedonia is a rare country in the world whose name has been continuously mentioned for more than two millennia. Confirmation of this is the Holy Scripture - Bible, the most important holy book of Christianity.

The paper will present integral excerpts from the New Testament, that is, from the travels of St. Paul the Apostle in Macedonia and the mention of the name Macedonia, Macedonian, Macedonian land and other formulations. The aim of the paper is the analysis of the mentions and presentation of Macedonia with an identity and image, and the promotion of a new tourist product "Biblical Macedonia" as a challenge to develop it into a tourist brand.

Keywords: Bible - Holy Scripture, Macedonia, Macedonian, Macedonian country
JEL Classification: Z32 Tourism and Development; Z39 Tourism: Other

INTRODUCTION

Macedonia is a biblical country. The Bible or Holy Scripture (created 1600 years, from 1500 BC - 100 AD) spiritual and historical heritage of Jews and Christians, "All Scripture is given by God" says the Apostle Paul (II Epistle to Timothy 3 ,16). The idea that the Bible is God-given means that St. A letter reached man as a finished product. Theologians agree that she has a divine-human character, that is, "...the holy men of God spoke enlightened by the Holy Spirit" (2 Peter's Epistle 1,21).

The Bible is composed of 66 books, of which 39 are in the Old Testament and 27 are in the New Testament. In the extended (Orthodox and Catholic) Bible, there are 11 additional books in the Old Testament, the so-called Deuterocanonical, ie. Apocryphal books, while in the New Testament, the number of books is the same in the Orthodox, Catholic and Protestant editions of the Bible, and the apocryphal gospels and epistles are not accepted by any Christians.

The New Testament is the central written testimony of Christianity, in which the main person represented is Jesus Christ. The New Testament contains 27 books, and is divided into six basic works: gospels (Matthew, Mark, Luke, John), beginnings of the Christian church (Acts of the Apostles), letters to specific churches (from Rom. to 2 Thess.), pastoral letters (from 1 Tim. to Heb.), council letters (from James to Jude) and a prophetic book (Revelation).

The New Testament was written in koine language (this language was also called Alexandrian, Hellenic, Macedonian, Patristic, and Common or Biblical), which was widely spoken at that time, even though Jesus and His disciples spoke Aramaic.

The main theme of the New Testament is Jesus Christ (the promised messiah from the Old Testament), and our goal is research and analysis of the mention of Macedonia and the Macedonians in the New Testament, the journey of St. Paul the Apostle through Macedonia and its presentation as a tourist product.

MATERIAL AND METHODS

Materials used in the research are the book of Holy Scripture - Bible, (Holy Scripture - Bible, 2017), literature (Dictionary of the Holy Scriptures (Bible dictionary), 2011; Atanasov,1995; Grozdanovski, 2007; Grozdanovski, 2014; Grozdanovski, 2017; Pavlovska & Niciforovic & Kocesvki, 2011; Karkalashev, 2004; Kornakov & Kajdamov,2000; Strategy, 2021; Dimitrov, 2022) and web pages. Valuable data was obtained from all of them for analysis and promotion of Biblical Macedonia as a tourist brand with characteristic religious content.

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RESULTS

In the New Testament of the Holy Scriptures (the Bible), the name Macedonia is mentioned 21 times, Macedonian 1 time, Macedonians 3 times and Macedonian churches 1 time or a total of 30 times, of which 4 times in a subtitle and 26 times in 23 verses, in 7 parts. (Holy Scripture - Bible, 2017)

Attached is the entire text from the New Testament where Macedonia is mentioned:

1. Acts of the Apostles: 13 times of which 10 times in 9 verses and plus 3 times in a subtitle, p. 163,166-168; (Acts Ap.: 16:9; 16:10; 16:12; 18:5; 19:21; 19:22; 19:29; 20:1; 20:3;

Acts of the Apostles:

- 16:9 And a night vision appeared to Paul: a Macedonian stood before him and prayed to him, saying: "Come to Macedonia - help us!"
- 16:10 And when he saw the vision, we immediately asked to go further to Macedonia, concluding that God called us to preach the Gospel to them.
- 16:12 and from there to Philippi, a Roman colony and the first city in that part of Macedonia. In we stayed in that city for several days.
- 18:5 And when Silas and Timothy came down from Macedonia, Paul was stirred up in the spirit to testify zealously to the Jews that Jesus is the Messiah.
- 19:21 When this was done, Paul made up his mind in his spirit, passing through Macedonia and Achaia, to go to Jerusalem, saying: "As soon as I am there, I must also see Rome."
- 19:22 And he sent to Macedonia two of his assistants, Timoteja and Erasta, and he himself remained for some time in Asia.
- 19:29 "Gaia and Aristarchus, Macedonians, Paul's companions..."
- 20:1 When the noise subsided, Paul called the disciples, counseled them; he said goodbye to them and left to go to Macedonia.
- 20:3 He stayed there for three months. Because the Jews conspired against him, when wanted to sail to Syria, he decided to return via Macedonia.

2. Epistle of the Apostle Paul to the Romans: 1 time in 1 verse, 15:26, p.218;

The Romans:

-15:26 for Macedonia and Achaia decided to gather together some help for the poor among the saints in Jerusalem.

3. First Epistle of the Apostle Paul to the Corinthians: 2 times in 1 verse, 15:5, 1:16, p.234;

1 Corinthians:

- 16:5 I will come to you after passing through Macedonia, because I am passing through Macedonia;
- 1:16 And through you I will go to Macedonia, and from Macedonia I will come to you again"

4. Second Epistle of the Apostle Paul to the Corinthians: 9 times of which 1 time in a subtitle and 8 times in 7 verses 1:16, 2:13, 7:5, 8:1, 9:2, 9:4 and 11: 9, p. 236,239-242;

2 Corinthians:

- 1:16 and through you to pass to Macedonia, and from Macedonia again yes I come to you, and you send me to Judea.
- 2:13 I had no peace in my spirit, because I did not find my brother Titus, and therefore after all I forgave them, I went to Macedonia.
- 7:5 For, since we came to Macedonia, our body had no peace; but we were in trouble everywhere; outside fighting, inside fear.
- 8:1 I inform you, brothers, about God's grace given to the churches in Macedonia;
- 9:2 "I boast to you before the Macedonians that Achaia..."
- 9:4 "So if Macedonians come with me and find you unprepared..."
- 11:9 because the brothers who came from Macedonia gave for my needs. And I was careful in everything, and I will be careful not to be a burden to you.

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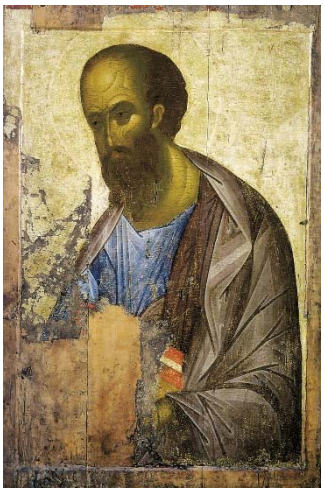
5. **Apostle Paul's letter to the Philippians**: 1 time in 1 verse, 4:15 p.260;
   Philippians:
   - 4:15 And you, Philippians, know that at the beginning of the preaching of the Gospel, when I left Macedonia, no church was with me in giving and receiving, except only you.
6. **First Epistle of the Apostle Paul to the Thessalonians**: 3 times in 3 verses, 1:7, 1:8 and 4:10, p.266 and 268;
   1 Thessalonians:
   - 1:7 so that you became an example to all the believers in Macedonia and Achaia.
   - 1:8 Because, from you the word of the Lord was proclaimed not only in Macedonia and Achaia, but your faith in God has expanded in every place, so that there is no need for us to we are talking something.
   - 4:10 and you do that to all the brothers in all of Macedonia. But please again brothers, do it even more
7. **First Epistle of the Apostle Paul to Timothy**: 1 time in 1 verse, 1:3, p. 273).
   1 Timothy:
   - 1:3 As I begged you, when I went to Macedonia, to stay in Ephesus, so that you command some not to teach otherwise.

DISCUSSION

In the New Testament, apart from Macedonia, no other name of today's neighbors is mentioned, which means that the name Macedonia and Macedonians is capitalized.

And that's why we Macedonians are under constant pressure from our neighbors, because they want to take away the name Macedonia and Macedonians.

The name Macedonia and Macedonians are biblical names, they are "alpha and omega - beginning and end", first and last, almighty and most important, and it will be so as long as man and the world exist.



Picture 1: Saint Paul the Apostle
https://en.wikipedia.org/wiki/Paul_the_Apostle

Apostle Paul was in Macedonia four times. First trip in 49 or 50. During the second missionary journey, in the year 50 or 51, he established the churches in Philippi, Thessalonica and Bere (Acts 16:9; 17:14). In his third missionary journey in 57, visiting the same places a second time. Together with Luke, he traveled Macedonia, preaching the Gospel through all the Macedonian cities as far as Illyricum and the eastern coast of the Adriatic Sea. At that time, in Macedonia, he wrote and sent the Second Epistle to the Corinthians (Acts 20.1; 2. Cor. 2, 12:13; 2. Cor. 7:5; 9; Rom. 15; 19; Acts: 2). 3. In the year 58, he passed through Macedonia for the third time, returning to Jerusalem and visited the cities in reverse order: Ber, Thessalonica, Philippi (Acts 20:3-6). 4. And the fourth time, when he wrote and sent the First Epistle to Timothy from Macedonia, in 64/65 (1 Tim. 1:3). (Dictionary of the Holy Scriptures (Bible dictionary), 2011, Grozdanovski, 2007, 2017)

The Luke, Timothy, Silas and Tychicus accompanied him on those trips, who themselves, independently of the holy apostle Paul, worked on the Christianization of the people in these areas. Apostle Andrew also preached throughout Macedonia, who installed Apostle Urban as the first bishop in Macedonia. Apostle Siluan was the first bishop of Thessalonica, and Epaphroditus in Adria or Adriakia (border area with Thrace). Of the disciples, Aristar and Secundus were originally from Thessalonica, Epaphroditus was from Philippi, and Gaius was from Dober (Dervia), which was probably located between Strumica

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and Valandovo. (Dictionary of the Holy Scriptures (Bible dictionary), 2011; Atanasov, 1995; Grozdanovski, 2007, 2014, 2017)

Picture 2 and 3: Church of St. Nikola and monument 2000 years of Christianity. The place where the apostle Paul set foot in Macedonia - Europe. https://www.google.com/search?q=Church+in+Kavala

The first trip to Macedonia was to the village of Rahce, a village in Kavala municipality, Kavala circle, Aegean Macedonia. Paul spoke before the gathered women, after which he met Lydia and baptized her. Lydia - was the first Christian in Europe, baptized by Apostle Paul. It was the cornerstone of the Church in Philippi near the present-day village of Rahce, Kavalsko in Aegean Macedonia. It happened in the year 51 or 52 at the beginning of the second missionary journey of the holy Apostle Paul (51-54 AD), which is described in the Acts of the Holy Apostles. The church in Philippi was the first European church founded by the apostle Paul. The Holy Apostle will say: The Macedonian Christians, willingly, with love and generous mercy, materially helped the work of the Lord God.

The city of Philippi (place of Seljani, Kavalsko, Aegean Macedonia) then had 2000 people. Apostle Paul probably visited the city in 49 and 50. Paul founded his first Christian community and preached Christianity for the first time on European soil. Paul was accompanied by Silas, Timothy, and possibly Luke. (Atanasov, 1995; Grozdanovski, 2007, 2014, 2017)

Picture 4:. The Wrecking of Lydia, Marie Ellenider, 1861.
https://en.wikipedia.org/wiki/Lydia_of_Thyatira

Saint Lydia is the cornerstone of the Church in Philippi. She is the first person who was baptized by the apostle Paul on European soil and is therefore celebrated as the first Christian woman - European. The baptism took place in the creek near the present-day village of Madjar Chiflik, later renamed Linija in her honor.

St. Lydia is a Macedonian saint, the first Christian in Europe. She was a rich and pious woman, married in the city of Philippi, and she came from an Asia Minor province, from the city of Thyatira, which was a Macedonian colony. Lydia was a seller of porphyry, a precious red fabric made in Asia that Europeans used for their rich clothing. The city of Thyatira was famous for dyeing its fabrics with the natural red dyes of porphyry. Lydia traded in porphyry (red dye) which was used for noble clothing, because there were military veterans in Philippi, and the city was rich. Her husband is not mentioned so it is assumed that she is a widow. It is

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thought that she was a proselyte, but she respected God, so she abandoned polytheism and was baptized, along with her close relatives.

In chapter 16 of the Acts of the Holy Apostles, the violation of Lydia is described as follows: "And a God-fearing woman from the city of Thyatira, named Lydia, who sold scarlet cloth, listened; and the Lord opened her heart to pay attention to what Paul was saying. And when she and her household were baptized, she asked us and said: "If you have recognized me as faithful to the Lord, then enter my house and stay in it!" And she forced us. (Acts 15:15-1)

When the Gospel reached Europe, it was not men who met it, but women, because they were the first to appear before the apostles. Apostle Paul actively involved women in missionary work and evangelization in the early Christian church. According to beliefs, Saint Lydia was hospitable and offered the apostles to live in her home. After the departure of the Apostle Paul with the companions, it is assumed that the Apostle Paul with the companions, it is assumed that the Apostle Luke stayed in Lydia's house. The house became the first Christian temple in Europe, following the example of the house of Mary the mother in Jerusalem. Besides Lydia, the Bible also mentions Euodia and Syntychia, as well as the men Epaphroditus and Clement. (Dictionary of the Holy Scriptures (Bible dictionary), 2011; Atanasov, 1995; Grozdanovski, 2007, 2014, 2017)

After the baptism, Saint Lydia asked the apostles to recognize her as faithful in the Lord, which they did, knowing her faith, modesty and piety.

St. Lydia was hospitable, so she offered the holy apostles to live in her home, so St. Apostle Luke will testify to that, and they finally accept, thus confirming that she is worthy for them to be in her home. After the departure of the Apostle Paul with his companions, it is assumed that the Apostle Luke stayed in Lydia's house. The house became the first Christian temple in Europe, following the example of the house of Mary, the mother of the evangelist Mark in Jerusalem. Lidija is the first Christian woman in the first Christian church in Europe - the church in Philippi, Macedonia. Apostle Paul only received gifts from this church for his missionary activity, because he knew that they were given from hearts full of love. This church becomes an example for the establishment of other churches in Macedonia and Hellas. It is considered that Lydia is the founder of the church in Thyatira, which is one of the seven churches in Asia, about which Saint John speaks in the Revelation. Eleven years after leaving Philippi, before the end of the first captivity in Rome (63-64), the apostle Paul writes an epistle to the Philippians, with a lot of love and personal memories: "God is my witness how much I love you all with the love of Jesus Christ and so, my beloved and much-desired brothers, my joy and crown, stand firm in the Lord, beloved." (Dictionary of the Holy Scriptures (Bible dictionary), 2011; Atanasov, 1995; Grozdanovski, 2007, 2014, 2017)

The masters of some of the baptized were not satisfied with the fact that their servants were baptized and because they would lose part of their income through this, they started a campaign in the city against the missionaries and Paul and Silas were imprisoned. After the strange earthquake that happened, the gates of the prison collapsed, but even so, Paul and Silas did not escape, after which a large part of the prisoners were converted. After this event, they continued their travels first to Berea and then to Athens. (Atanasov, 1995; Grozdanovski, 2007, 2014, 2017)

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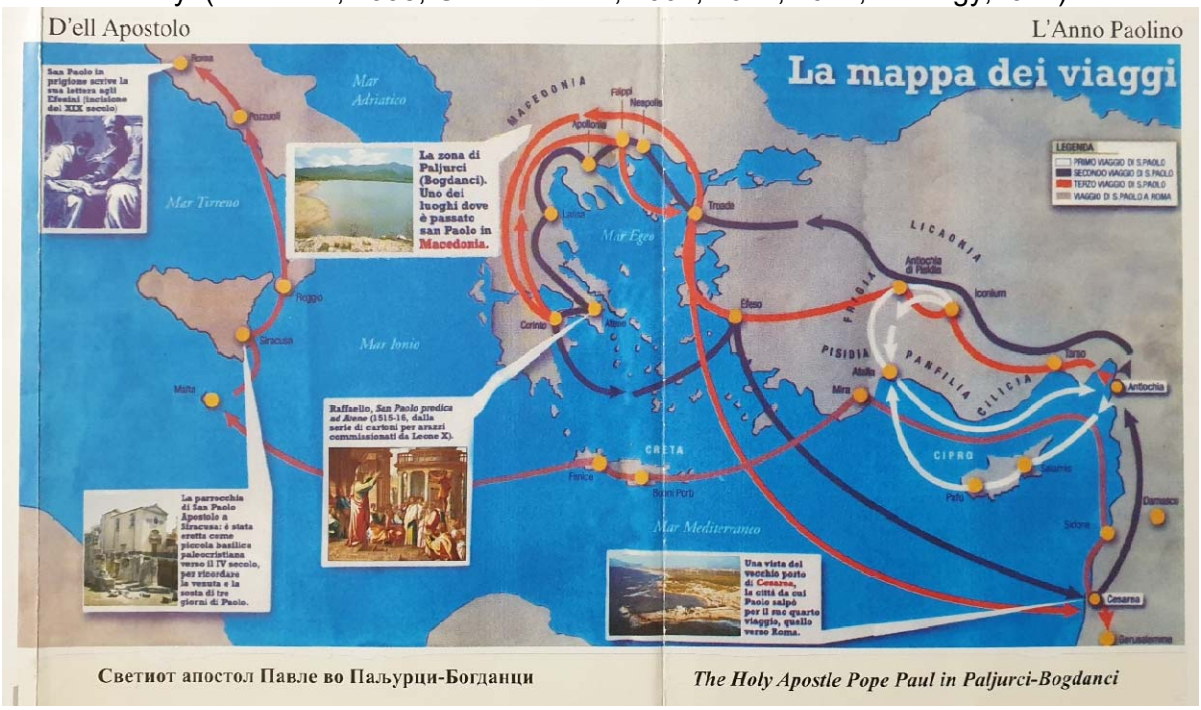
Picture 5: Today's memorial baptistery at the place where it is believed that the Apostle Paul baptized Lydia
https://en.wikipedia.org/wiki/Lydia_of_Thyatira

After leaving the apostle Luke in Philippi, the apostle Paul went to Thessalonica with Silas and Timothy. It happened in the spring of the year 50 along the Via Egnatia road. There they began to preach the gospel in Jason's house, in his weaving shop, in private homes.

In the year 51, the apostles Paul, Silas and Timothy left Thessalonica and went to Ber, where Sosipater Pirov became the first companion of the apostle Paul (Acts 20:4). Leaving Silas and Timothy in Berea, the holy apostle Paul decided to leave Macedonia and, by sea, went to Athens (Acts 17:15). (Holy Scripture - Bible, 2017; Dictionary of the Holy Scriptures (Bible dictionary), 2011; Atanasov, 1995; Grozdanovski, 2007, 2014, 2017)

In Macedonia, there is a legend that Saint Paul the Apostle with his companions, in addition to the cities of Philippi, Thessaloniki and Ber, also visited the settlements: Ser, Drama, Petrich (Heracleia Sintika), Strumica, Valandovo, Bogdanci, Dojran, and other small settlements. There is also a legend that every place he visited and preached was called "Paul's place" - one such was the village of Palurci or Pavlerci, which is named after the Apostle Paul. Later, a monastery "Apostol Pavle" was built in his honor near the village. The village does not exist today and has been completely displaced since 1924 and there are no remains of the monastery. (Atanasov, 1995; Grozdanovski, 2007, 2014, 2017; Strategy,2021)



Picture 6: The Travels of the Apostole Paul and Hoslu Apostole Pope Paul in Paljurci - Bogdanci
https://www.google.com/search?q=Dell+Apostolo+Paolo%2C+la+mappa+dei+viaggi

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Macedonia has been a Christian country for two millennia. This tradition is mirrored through the presence of over 2350 churches (2300 Orthodox churches, chapels and monasteries and 50 Catholic churches[1]). The importance of Macedonia for Christianity is also seen through the practice, that is, the construction of churches dedicated to the first European missionaries, the Holy Apostles Paul and Luke, and to the first Christian in Europe, St. Lydia of Macedonia. Thus, today there are a total of 5 churches dedicated to St. Paul the Apostle in RS Macedonia, then 1 church dedicated to St. Apostle and Evangelist Luke and 2 churches dedicated to St. Lydia the Macedonian - the first Christian and the first female Christian in Europe. These eight churches symbolize the beginning of Christianity in Macedonia and Europe. Here we would add 42 more churches and monasteries dedicated to the two apostles Saints Peter and Paul.

Today, there are a total of 53 churches and monasteries in RS Macedonia (42 churches and 8 monasteries, of which 2 have guest houses) that bear the name of Saint Paul the Apostle (5), Saint Peter the Apostle (3) and together Saint Apostles Peter and Paul (42), Saint Lydia (2) and Saint Luke the Apostle and Evangelist (1). (See: Table 1.)

Table 1: Temples - churches and monasteries that bear the name of St. Apostle Paul, St. Apostle Peter, St. Apostles Peter and Paul [2], St. Apostle and Evangelist Luke[3] and Saint Lydia [4] by settlements in the northern part of Macedonia [5]

sn	DIOCESE	VISITOR	PARISH	Type and name of the temple	Place (settlement)
1.	**SKOPSKA DIOCESE**	Northern Skopje Archieral	/	Church St. Apostles Peter and Paul	Gorche Petrov
2				Church St. Apostles Peter and Paul	Jurumleri
3.				Church St. Apostles Peter and Paul	Ajvatoks
4.		South Skopje Archieral	/	Church St. Apostles Peter and Paul	Gorno Lisice
5.				Church	Pakoshevo

[1] It means the northern part of Macedonia. That is, from 2019, the Republic of North Macedonia.

[2] Days when the two apostles are celebrated are: St. Apostle Peter is celebrated on June 29 (old style) or July 12 (new style), this day is also known as "Petrovden". Saint Peter the Apostle is celebrated the following day, June 30 (old style) or July 13 (new style) and is known as "Paul's Day" but also as "Council of 12 Apostles". Denovi.mk Orthodox calendar: https://denovi.mk/

[3] Saint Luke the Apostle is celebrated on October 18 (old style) or October 31 (new style). On the other hand, a church dedicated to Saint Timothy the Apostle has not been built in Macedonia. Saint Timothy the Apostle is celebrated on January 22 (old style) or February 4 (new style). Also, there is no church dedicated to Saint Silas the Apostle who is celebrated on July 30 (old style) or August 12 (new style). Denovi.mk Orthodox calendar: https://denovi.mk/ Saints Luke, Timothy and Silas are the three apostles who accompanied Saint Paul in his missionary journeys throughout Macedonia. There is another church dedicated to Saint Luke the Apostle and Evangelist in the village of Vrejot in Aegean Macedonia and in the city of Kavala, Greece.

[4] Saint Lydia of Macedonia is celebrated on March 27 (old style) or April 9 (new style) Denovi.mk Orthodox calendar: https://denovi.mk/ There is another church dedicated to St. Lydia the Macedonian in Philippi (near Kavala), R. Greece.

[5] Since 2019, the Republic of North Macedonia has been added to the name of the Republic of Macedonia. In this text, we will also mention only the terms Bogoslovec, Bogdanci, Bogomila, Monastery and Church. All of them speak in favor of the biblical importance of the Macedonian language, the Macedonian and Macedonia as an absolute divine truth given by God.

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				St. Apostles Peter and Paul	
6.			/	Church St. Apostles Peter and Paul	Bitola
7.				**Church of St. Lydia**	**Bitola**
8.			Bistrichka	Church St. Apostles Peter and Paul	Zabeni
9.		Bitola Archieral	Lisolajska	Monastery St. Apostle Peter and Paul (with dormitory for monks)	Crnevec
10			Novachka	Church St. Apostles Peter and Paul	Dolno I Gorno Aglarci
11			Dobrishevo - Dedebalchka	Church St. Apostles Peter and Paul	Radobor
12	**PRESPANSKO - PELAGONISKA DIOCESE**	Archieral of Prilep	Vitolishte	Church St. Apostles Peter and Paul	Zivojno
13			/	Monastery St. Apostles Peter and Paul	Dunje
14			Varoshka	Church St. Apostles Peter and Paul	Varos, Prilep
15		Archieral of Ressen	/	Monastery St. Apostles Peter	Resen
16			/	Church St. Apostles Peter and Paul	Podmocani
17			/	Church St. Apostles Peter and Paul	Ljubojno
18			/	Cave Church of St. Peter and Paul	Konjsko
19			/	Monastery St. Apostles Peter	Big City (island)
20		Krushevo - Demirhisar Archieral	/	Monastery of St. Peter and Paul (with lodgings)	Smilevo
21			/	Church St. Apostles Peter and Paul	Sveta
22	**BREGALNICKA DIOCESE**	Stip Archieral	Sveti Nikole	**Church of St. Apostle Paul**	**Ercelija**
23				**Church of St. Lydia of Macedonia**	**Sveti Nikole**
24		Kochan Archieral	Kocanska	Church St. Peter and Paul	Pribacevo

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25			Vinichka	**Chapel of St. Apostle Paul**	**Vinica**
26				**Church of St. Apostle and Evangelist Luke**	**Vinica**
27	**DEBARSKO - KICHEVSKA DIOCESE**	Archieral of Brod	Manastirechka	Church of St. Peter and Paul	Lupuste
28				Church of St. Peter and Paul	Zvecan
29				Church of St. Peter and Paul	Blizansko
30				Church of St. Peter and Paul	Bitovo
31		Debar Archieral	Debarsko - Rekanska paris	Church St. Apostles Peter and Paul	Tresonce
32				Church St. Apostles Peter and Paul	Galicnik
33		Kichevo Archieral	First Kichevska	Central parish church of St. Apostles Peter and Paul	Kicevo
34			Fourth Kichevska	Church of St. Peter and Paul	Srbjani
35				Church St. Apostles Peter and Paul	Tajmiste
36		Archieral of Struga	Third Stuska	Monastery church St. Peter and Paul	Kalista
37		/	Vevcanska	Monastery church St. Peter and Paul	Vevcani
38		Ohrid - Archieral	Belchishka	Church of St. Peter (under construction)	Lesani
39			Koselska	Church St. Apostles Peter and Paul	Kosel
40			Velmejska	Monastery of St. Apostles Peter and Paul (with lodgings)	Brezani
41			Godivska	Church of St. Peter and Paul	Vrbjani
42	**TETOVSKO-GOSTIVARSKA DIOCESE**	Archieral of Gostivar	/	Church St. Apostles Peter and Paul	Dolna Banica
43			/	Church of St. Peter and Paul	Brodec
44			/	Church St. Apostles Peter and Paul	Zelena Reka
45	**KUMANOVSKO-OSOGOVSKA**	Krivopalnechko Archieral	/	**Apostle Paul Church**	**Гиновци**

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46	**POVARDARSKA DIOCESE**	Archieral vicarage of Veles		**Church of St. Apostle Paul (under construction)**	**Градско**
47			Izvor Parish	Church of St. Peter and Paul	Smilkovci
48			Bogomila Parish	Church of St. Peter and Paul	Papradiste
49	**STRUMICHKA DIOCESE**	/	/	Church St. Apostles Peter and Paul	Saraj
50				Church of St. Peter and Paul	Ratevo
51				Church of St. Peter and Paul	Pehcevo
52	**CATHOLIC CHURCH**	Apostolic Exarch	Gevgelija - Bogdan region	Church of St. Peter and Paul	Gevgelija
53				**Church of St. Paul[6] (no remains)**	**Paljurci (displaced)**

Source: Jelena Pavlovska, Natasa Nikiforović, Ognen Kocevski, (2011); Strategy for the development of religious tourism and support of active monasteries (2021); Dimitrov, Nikola (2022). Compiled NVD.

CONCLUSION

The presented data is a solid basis for "Biblical Macedonia" as a tourist challenge with a religious sign. In the context of this, we propose a new tourist idea, which must be promoted and applied by tour operators, travel agencies and other stakeholders for the popularization of religious tourism not only in RS Macedonia, but also familiarization with religious objects in neighboring countries. Namely, along the path of Saint Paul the Apostle in Macedonia is a good opportunity for a new tourist content "Biblical Macedonia", as a regional religious circular tourist trail or route.

Tourists will have the opportunity to visit several churches, monasteries and places through a several-day tourist trip, namely: departing from Strumica, visiting the Orthodox church "St. 15 Martyrs of Tiberiopolis, and Cathedral of the Assumption of the Blessed Virgin Mary in Strumica; Church of St. Ilia and the Partenie Zografski monastery complex in Dojran; Catholic Church of St. Cyril and Methodius and Orthodox Church of St. Atanasij in Bogdanci and Paljurtsi artificial lake built on the site of the former Paljurtsi village. Today, near the lake, there is a chapel built "Mother of God the Comforter" *(About the village of Paljurtsi or the Turkish village of Pavlertsi, there is a legend that the name comes from the Apostle Pavle, who when he came to preach Christianity, called every place he visited "Paul's place". Later, in his honor, the Apostle Pavle monastery was built near the village . The village does not exist and has been completely displaced since 1924),* at the end there is a visit to the churches of Saint Spas, Saint Cyril and Methodius and the Catholic church of Saint Peter and Paul in Gevgelija, where we spend the night (in RS Macedonia). The next day we continue to Greece and along the way we visit the famous places: churches of St. Theodore Tyrone and St. Nicholas in Sir; St. Panteleimon, St. Sophia in Drama; Holy Catolic church Saint Paul Catedral and Church of St. Nikola (the place where the Apostle Paul set foot in Macedonia - Europe. In 2000, a monument was built at this place) and Holy monasteru of Apostle Silas, Holy shrine-baptistery of Sent Lydia of Thyatira and the church of St. Assumption of the Blessed Virgin Mary in Kavala, sightseeing and overnight stay in Kavala (in Greece); and the third day

[6] Holy Catolic church Saint Paul Catedral in Kavala

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continues with a visit to: Church of St. Assumption of the Blessed Virgin Mary in Petrich, Heraclea Sintika locality, and Complex "Vandja" - Rupite, sightseeing and overnight stay in Petrich (in the Republic of Bulgaria).

The tourist-religious route can also be in other directions: Kavala - Petrich - Gevgelija; then Petrich - Kavala - Gevgelija; Strumica - Gevgelija - Petrich - Kavala, etc. We appreciate that this offer is a solid basis for the beginning of the realization of the Touristic - religious idea "Biblical Macedonia" as a real tourist challenge.

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