# MODELLING OF TOURISM SERVICE DYNAMICS UNDER THE INFLUENCE OF ECONOMIC PATTERN OF SOCIETY

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**Abstract.** Tourism as a phenomenon of social life is a derivative of social development. Its appearance is attributed to the industrial stage of human development, which was inherent in the accelerated development of the productive forces, deepening division of labour, development of urbanization processes. Accelerated innovation changes related to scientific and technological progress contributed to the overall socio-economic development of certain countries, improve the living standards of their populations, changed the nature of work, method and way of life, especially evident in the XX century. Urbanization and changes in the settlement system, post-industrial phase of economic development, deepening comprehension of environmental issues and global dimension of humanity, humanization of all spheres of public life. The increase in tourist flows in all regions complicates the management of enterprises, schemes of partnership in the process in tourism, which, among other things, is accompanied by rising levels of consumer education, and therefore their quality requirements for end tourism product, the rapid increase in supply, there is a need to study the characteristics of consumer behaviour, search for existing reserves to build capacity of individual enterprises, isolation and effective use of effective methods and tools of influence on consumer choice of consumers. Development and implementation of an effective mechanism of formation of market supply needs an assessment of consumer behaviour on quantitative and qualitative indicators. The rapid development of tourism, of course, helps determine the types and methods of calculating these indicators. These problems and targeted research are considered in this article. The *subject of research* is the concept and tools of analysis, mathematical modelling of the economic structure of society in dynamic tourist services. *Research methodology* is economic and mathematical models, algorithms and processes dynamics of tourist services. The *study* is creating simulation economic structure of society in dynamic tourist services. To achieve this goal was set and solved the following tasks: to conduct computational experiments planned to reveal the real trend of economic systems, and – to explore possible economic laws implementing services in terms of appropriate control measures. *Conclusions*. With solutions, built model follows in principle the possibility of optimal control over modern economic processes, the possibility of disposal of available industrial residues and further the economic development of our country.

**Key words:** tourism, economic sociology, welfare and poverty, model construction and es-timation, dynamic treatment effect models.

**JEL Classification:** L83, Z13, I3, C51, C32

## 1. Introduction

In terms of the invariance of the total amount of money in the economy (which corresponds to simple reproduction, which occurred during the market transformation) in the economic system with parameters close to real on the economy, a sharp reduction in the size of savings is economically passive people (workers, pensioners who have sustainable yield) and a sharp increase in the amount of savings of economically active citizens (whose income depends on the amount of savings). The volume of tourist services remains almost constant. Depending on the initial conditions, approximately the initial state is more or less resizing production $F\left(\gamma_2 z_2(t)/p_A(t)\right)$ and tourism $S\left(\beta_2 z_2(t)/p_B(t)\right)$. After this change the size of tourism services remains almost constant.

Therefore, if a constant amount of money in the economy solutions designed models simulate simple reproduction (production without extension), which stores was the intensity of tourist services. Depending on the ratio, capital expenditure for tourist services and performance of their respective functions in the economy is a situation full or part of tourist facilities. In the latter case are tourist attractions that are not involved in tourism.

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From this, it follows that to increase tourism in the modern economy of our country, tourism infrastructure should be extended. In this part the capital should be directed to the development of existing and new tourist facilities.

## 2. Economic crisis effects on consumer behaviour

Given that the key idea of our work is to achieve a competitive advantage national tourist and recreational complex, one of its basic methodological components selected theory M. Porter. With the conviction of Porter (Porter E. 2005) in the production of competitive products, including, and tourism, must take into account the specific needs of customers. Therefore, to develop theoretical and methodological foundations of tourism and recreational complex of necessary depth study of consumer needs products of its activities. The general theory of needs and motivations of consumers developed such renowned scientists as Alderfer K., Herzberg O., Kotler F. (Kotler, 2003), MakKleland D., Maslow T., Murray G., Porter (Porter, 2005), Lawler and other scientists. Among the scientists who analysed in detail the needs and motivations of consumers of the tourism sector; it is necessary to note Balabanov T. (Balabanov, 2000), Varypayeva A., Ghana G., Quarterly V. (Quarterly, 2002), L. Kid, Rutynskyy M. (Rutynskyy, 2006), Saprunova V., Semenov V. (Semenov V. 2010), Shoemaker and others. Important in terms of an integrated approach to the development of tourism and recreation areas are also research results on recreational needs, as one of the motivational needs of consumers of tourist products presented in the works of Chornenka N. (Chornenka, 2006), Maslyak P., Fomenko N. (Fomenko, 2007) and others.

## 3. Differences in consumer spending behaviour among age groups

Here is making a simulation of the economic structure of society in dynamic tourist services. To achieve this goal it is set and solved the following tasks: to conduct computational experiments planned to reveal the real trend of economic systems, and to explore possible economic laws implementing services in terms of appropriate control measures.

## 4. Survey methodology

We have the task to simulate actual patterns of economic system in view of financial constraints in the region or the country as a whole. This situation corresponds to the economic conditions prevailing in the country during the economic transformation.

Further activities modelled economical system enabling it to intensive development. This condition rejected by the renormalization, the assumption that $n_0 z_0(t) + n_1 z_1(t) + n_2 z_2(t) = Z(t)$, where $Z(t)$ – the total amount of money in the economy. Solutions of this model simulating a situation of economic development with the creation of surplus value.

Schedules found solutions $z_0(t)$, $z_1(t)$, $z_2(t)$, $p_A(t)$, $p_B(t)$ model shown in Fig. 1-5. In Fig. 1-5 is shown a typical economic situation, which meets economic conditions in our country – namely, saving all social groups are growing (see. Fig. 3 and 4), but the capital of tourism enterprises (saving their owners) is much larger and growing faster (Fig. 5).

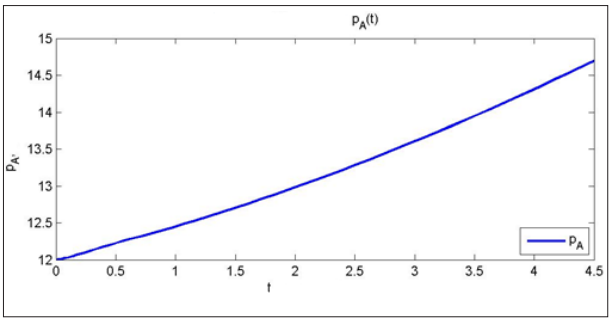



**Fig. 1. The dynamics of prices of goods $p_A(t)$**

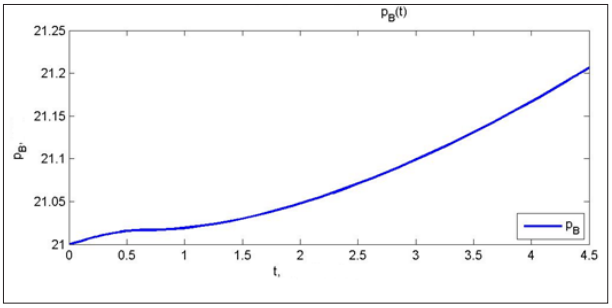



**Fig. 2. The dynamics of tariffs for tourist services $p_B(t)$**

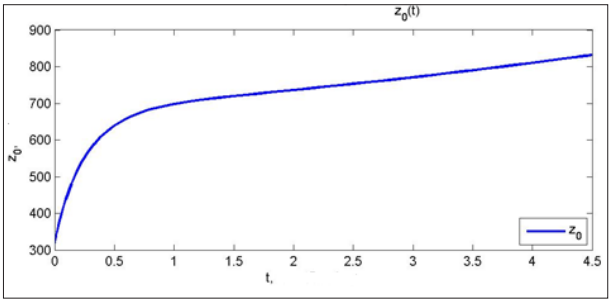



**Fig. 3. Schedule dynamics savings of pensioners $z_0(t)$**

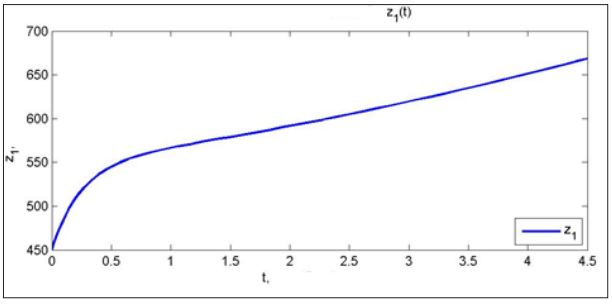



**Fig. 4. Schedule dynamics savings of workers $z_1(t)$**

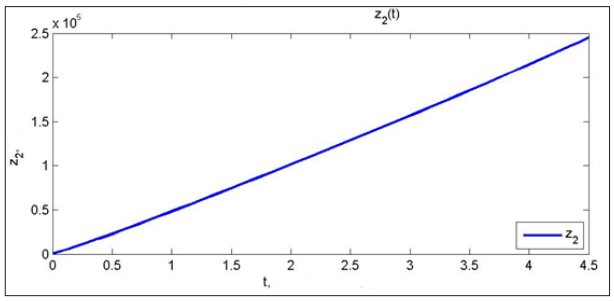



**Fig. 5. The dynamics of tourism enterprises owners of savings (capital of tourism companies) $z_2(t)$**

Product price increases with weak acceleration (Fig. 4), which also corresponds to the real economic processes. Tariff for tourist services $p_B(t)$ is a more complex behaviour. First $p_B(t)$ increases approximately linearly, then – slow growth and then – rapidly increase, which corresponds to the dynamics of pricing for products, that in the long run the price of travel services and tariffs for tourist services vary from one and the same pattern. They grow rapidly, displaying different intensity of such growth. Partly patterns appear in this famous inflation, over time, the value of goods and services increases. Experimentally that differences in intensity of growth $p_B(t), p_A(t)$ due to the sensitivity of goods and services to the tourism market value of tourism infrastructure and tourist services in consumption. This "sensitivity to market conditions" in turn depends on the length of the production cycles of tourist sites, tourism consumption.

Local maximum fare $p_B(t)$ in the neighbourhood of $t$=0.5 corresponding to an amount of capital expenditures for travel services $s = \beta_2 z_2(t) / p_B(t)$, in which the function of tourism $S(s)$ reaches a point of inflection. This is a kind of balance on tourism activities. The highest rate reflects the commercial profitability of tourist services, and bend function $S(s)$ premise corresponds substantially larger volume of tourist services. Under such conditions, it is advisable to improve the infrastructure of tourist facilities. The model transformation function is responsible for tourism upward derivative $dS/ds$. In the developed model the change, function $S(s)$ is not available. Computational experiments to change $S$ are described below.

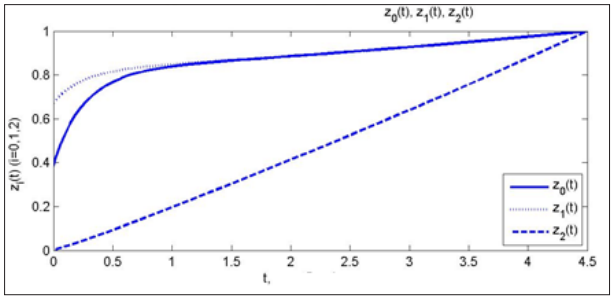



**Fig. 6. Charts normalized values $z_0(t), z_1(t), z_2(t)$**

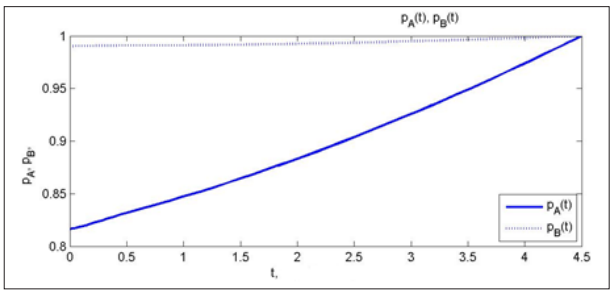



**Fig. 7. Charts normalized values $p_A(t), p_B(t)$**

Figure 6, 7 respectively show graphic normalized values of saving of three groups of participant's economy $z_0(t), z_1(t), z_2(t)$ and price and tariff for tourist services $p_A(t), p_B(t)$. A comparison of these graphs shows that the long period (after transients near original state) savings of workers and pensioners have the same tendency to change (though different scale of values). Savings business owners remain almost constant growth rate. This means that within the conceptual model adopted one-pie economy capital increase at tourism enterprises does not lead to significant changes in the pace of infrastructure development of tourist facilities. This is an unfavourable economic phenomenon. To enhance tourism facilities there is needed a motivation other than that adopted in the conceptual model. According to this model tourist enterprises themselves determine the share capital $\beta_2 z_2(t)$, they point to the infrastructure development of tourist facilities and fare for travel services dynamically depending on the volume of travel services. This is completely subjective planning; tourism meets economic circumstances in our country in recent years of Soviet rule and the beginning of market transformation. Because decoupling model built in accordance with these terms does not show the desired increase in tourism, for the formation of developed tourist infrastructure objects there are necessary regulatory measures for the more advanced existing today.

To identify dynamic variables dependent model of economic system on the performance of tourism services there is made a computing experiment in which simulated growth performance parameters in the function $S(s)$. The results of this experiment are shown in Figure 8-12.

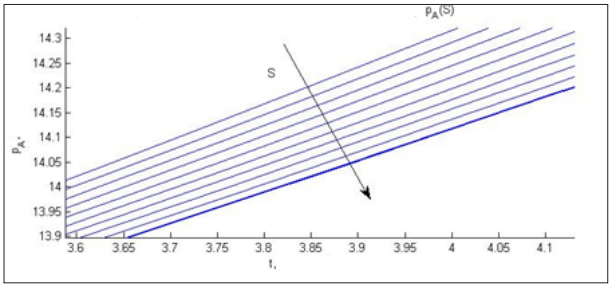



**Fig. 8. The graph of prices of tourist services $p_A(t)$ performance S(s) tourist sites**

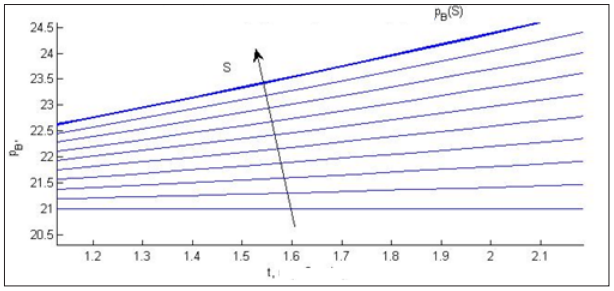
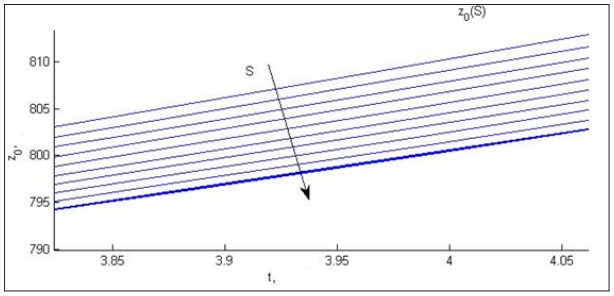



**Fig. 9. Graph of the rate of travel services $p_B(t)$ performance S(s) tourist sites**

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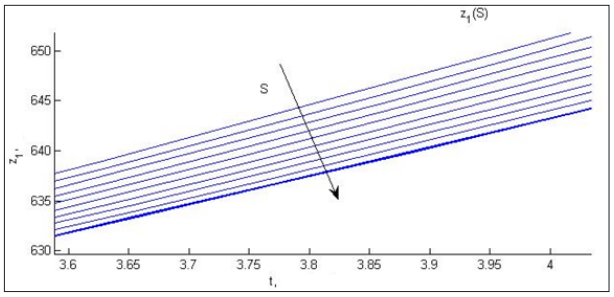


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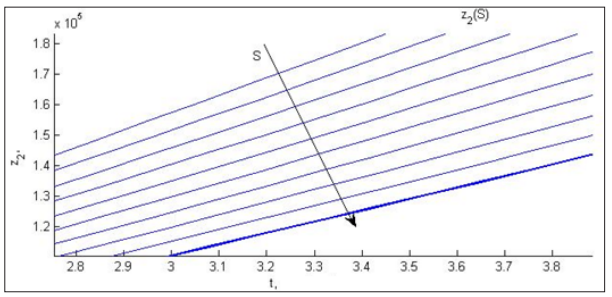
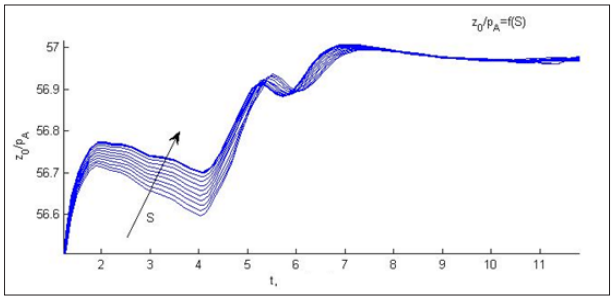



c)

**Fig. 10. The graph of the savings of pensioners $z_0(t)$ (a), workers $z_1(t)$ (b), business owners $z_2(t)$ (c) performance S(s) tourist services**

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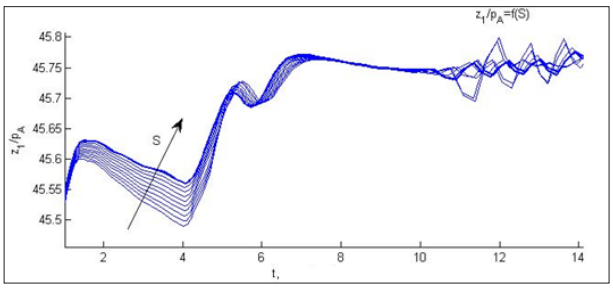


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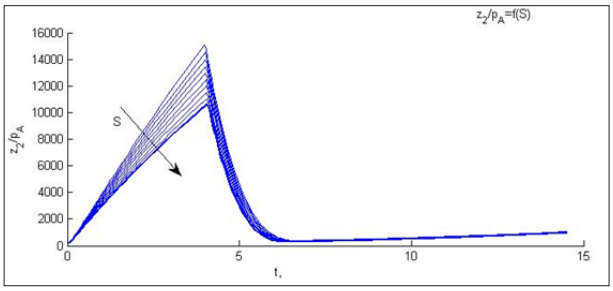
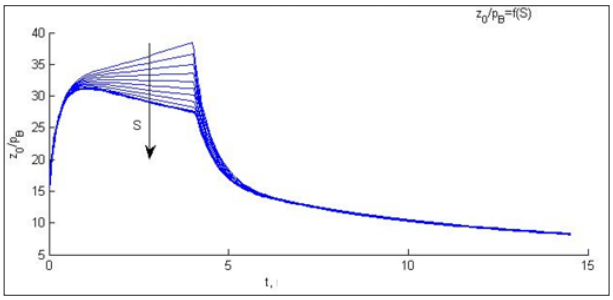
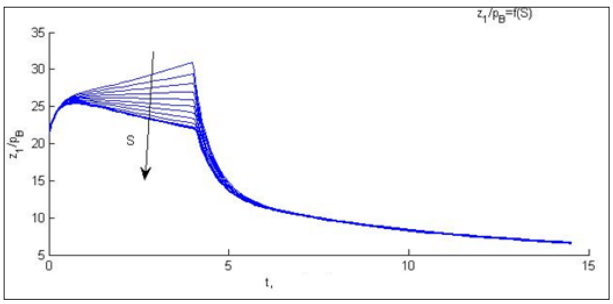



c)

**Fig. 11. The graph of the purchasing power of pensioners $z_0/p_A$ (a), workers $z_1/p_A$ (b), business owners $z_2/p_A$ (c) performance S(s) tourist services**




a)

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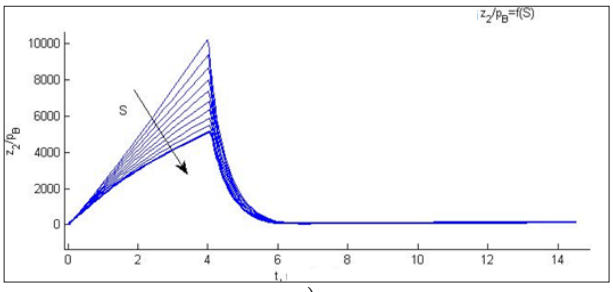


c)

**Figure 12. The graph of The graph of provision of capital tourism $z_0/p_B$ (a), $z_1/p_B$ (b), $z_2/p_B$ (c) the performance of travel services based instant performance increase tourist site (arrow direction indicated increased productivity tourist attraction)**

## 5. Conclusions

As it was noted, increase in the intensity of tourist services leads to lower prices $p_A$ (Fig. 8) and decrease savings $z_1(t)(i=0,1,2)$ (Fig. 10). However, the deployment of a tourist facility weakly affects the purchasing power of all economic groups. Fig. 11 shows a graphic of purchasing power of pensioners $z_0/p_A$ (a), workers $z_1/p_A$ (b), business owners $z_2/p_A$ (c) performance $S(s)$ tourist facilities. It turns out that their purchasing power varies slightly with significant changes in productivity tourist attractions. Nevertheless, the purchasing power is responsive to the immediate situation in the tourism sector.

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## МОДЕЛИРОВАНИЕ ВЛИЯНИЯ ЭКОНОМИЧЕСКОЙ СТРУКТУРЫ ОБЩЕСТВА НА ДИНАМИКУ ТУРИСТИЧЕСКИХ УСЛУГ

**Аннотация.** Туризм, как явление общественной жизни, является производной общественного развития. Своим появлением он обязан индустриальной стадии развития человечества, которой был присущ ускоренное развитие производительных сил, углубления разделения труда, развитие урабанизационных процессов. Ускоренные инновационные изменения, связанные с научно-техническим прогрессом, способствовали общему социально-экономическому развитию определенных стран, повышению уровня жизни их населения, меняли характер труда, способ и стиль жизни, особенно отразилось в XX в. развитием урбанизации и изменениями в системе расселения, постиндустриальной фазе развития экономики, углублением экологических проблем и постижением глобальных масштабов деятельности человечества, германизацией всех сфер общественной жизни. Увеличение туристических потоков во всех регионах значительно усложняет управление предприятиями, схемы партнерства в технологическом процессе в сфере туризма, который, кроме всего прочего, сопровождается ростом уровня образования потребителей, а, следовательно, их требования к качеству конечного туристского продукта, с быстрым увеличением предложения, естественно, возникает необходимость изучить характеристики потребительского поведения, поиск существующих резервов для наращивания потенциала отдельных предприятий, изоляции и использования эффективных методов и рычагов влияния на потребительского выбора потребителей. Разработка и внедрение эффективного механизма формирования предложения на рынке оценки потребностей потребительского поведения на количественные и качественные показатели. Быстрое развитие туризма, несомненно, способствует определить типы и методы расчета таких показателей. Именно эти проблемы и целенаправленных исследований в этой статье. *Предметом исследования* является концепция и инструментарий анализа, математического моделирования влияния экономической структуры общества на динамику туристических услуг. *Методологией* исследования является экономико-математические модели, алгоритмы процессов динамики туристических услуг. *Целью исследования* является создание имитации экономической структуры общества в динамических туристических услугах. Для достижения этой цели были поставлены и решены следующие задачи: провести вычислительные эксперименты планируется раскрыть реальные тенденции экономических систем, а также – изучить возможные экономические закономерности реализации услуг в условиях соответствующих мер регулирования. *Выводы*. С решений построенной модели следует принципиальная возможность оптимального управления современными экономическими процессами, возможность обезвреживания существующих промышленных остатков и дальнейшего эффективного экономического развития нашей страны.