On the construction of solution of economic problems described by systems of ordinary differential equations with delay

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For the linear boundary value problems on interval $I = [0, T]$

$$x'(t) = P(t)x(t) + p_0(x)(t) + q(t), \quad x(t_0) = l(x) + c_0,$$

where $P \in L(I; \mathbb{R}^{n \times n})$, operator $p_0 \colon C(I; \mathbb{R}^n) \to L(I; \mathbb{R}^n)$ and functional $l \colon C(I; \mathbb{R}^n) \to \mathbb{R}^n$ are linear and bounded, $q \in L(I; \mathbb{R}^n)$, $t_0 \in I$, $c_0 \in \mathbb{R}^n$ the method is described of construction of its solutions. The problems of this type describe linear dynamic models of delayed economic processes. Our method is applied to solve selected economic problems.

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References

[1] Bellen, A., Zennaro, M., *Numerical methods for delay differential equations*. 1. Oxford: OUP Oxford, 2013.

[2] Bobalová, M.,Novotná, V., The Use of Functional Differential Equations in the Model of the Meat Market with Supply Delay. In: *Procedia - Social and Behavioral Sciences*. Elsevier, 2015, **213**, 74–79.

[3] Kiguradze, I., *An initial value problem and boundary value problems for systems of ordinary differential equations. Vol. I: Linear theory*. 1. Tbilisi: Metsniereba, 1997.

[4] Kiguradze, I., Půža, B., On boundary value problems for systems of linear functional differential equations. *Czechoslovak Math. J.* Praha, 1997, **47**(2), 341–373.

[5] Kiguradze, I., Půža,B., *Boundary value problems for systems of linear functional differential equations*. Brno: Masaryk University, 2003.

[6] Novotná, V., The Impact of the Inflation and Unemployment Values from the Previous Period on the Phillips Curve. In: *The 7th International Scientific Conference "Business and Management 2012". Selected papers*. Vilnius, Lithuania: VGTU Publishing House Technika, 2012, 147–155.

[7] Varysová, T., Novotná, V., Solution of Dynamical Macroeconomic Model Using Modern Methods. *Journal of Eastern Europe Research in Business and Economics*. IBIMA Publishing, 2015, **2015**(1), 1–10.