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**OPTIMAL CONTROL IN INFINITE HORIZON PROBLEMS:
A SOBOLEV SPACE APPROACH**

Cuong LE VAN¹, Raouf BOUCEKKINE² and Cagri SAGLAM³

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Abstract

In this paper, we make use of the Sobolev space $W^{1,1}(\mathbb{R}_+, \mathbb{R}^n)$ to derive at once the Pontryagin conditions for the standard optimal growth model in continuous time, including a necessary and sufficient transversality condition. An application to the Ramsey model is given. We use an order ideal argument to solve the problem inherent to the fact that L^1 spaces have natural positive cones with no interior points.

Keywords: optimal control, Sobolev spaces, transversality conditions, order ideal.

JEL Classification: C61.

¹CNRS, CERMSEM, Université de Paris 1, France and CORE, Belgium. E-mail: levan@univ-paris1.fr

²Department of Economics and CORE, Université catholique de Louvain, Belgium. E-mail: boucekkine@core.ucl.ac.be

³Bilkent University, Turkey.

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