

# ON THE NONLINEAR VOLTERRA INTEGRAL EQUATION OF SECOND KIND ARISING IN PROBLEMS OF MATHEMATICAL FINANCE

Malkhaz Shashiashvili<sup>\*</sup>, Besarion Dochviri<sup>\*\*</sup>, Petre Babilua<sup>\*\*\*</sup>

Iv.Javakhishvili Tbilisi State University, Faculty of exact and natural sciences, Tbilisi, Georgia

<sup>\*</sup>[malkhaz.shashiashvili@tsu.ge](mailto:malkhaz.shashiashvili@tsu.ge), <sup>\*\*</sup>[besarion.dochviri@tsu.ge](mailto:besarion.dochviri@tsu.ge), <sup>\*\*\*</sup>[p\\_babilua@yahoo.com](mailto:p_babilua@yahoo.com)

In this report we consider the nonlinear Volterra integral equation of second kind with kernel having four arguments satisfied by the early exercise boundary of the American put option. The question of uniqueness of the solution of this integral equation remained open for some period as pointed out by Myneni [1] (p.17). It was resolved by Peskir [2] and by Babilua, Bokuchava, Dochviri and Shashiashvili [3] using certain mixture of probabilistic and analytical methods.

Up to now the latter integral equation seems to be out of the scope of any existing theory on nonlinear integral equations and therefore it has been especially interesting to find purely analytical proof of the uniqueness result. In our report we shall discuss such an analytical proof based on the technique of Sobolev spaces.

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## References

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