



Solving fuzzy equations in economics and finance

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Abstract

In this paper we apply our new solution procedure for solving fuzzy equations (linear, non-linear, differential) to three problems in economics and finance. The three applications are: (1) Leontief's input-output model; (2) the internal rate of return; and (3) a dynamic supply-demand model where price and supply are governed by a system of differential equations.

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Keywords

Economics; algebra; analysis

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...Gutiérrez (1989) developed the fuzzy present value formula in which the cash flows and the discount rates are modeled as triangular fuzzy numbers and so make fuzzy cash flow analysis more manageable. After those papers, several authors have contributed to refine the fuzzy capital budgeting theory (Banholzer, Sanches, Pamplona, & Montevechi,

2005; Boussabaine & Elhag, 1999; Buckley, 1992; Carlsson & Fullér, 1999; Çetin & Kahraman, 1999; Chiu & Park, 1994, 1998; Dymowa, 2011; Gao, Zhao, & Ji, 2005; Gil-Aluja, 1997, 1999, 2004; Gil-Lafuente, 1990, 2001, 2005; Kahraman, Ruan, & Tolga, 2002; Kuchta, 2000; Mohamed & Mccowan, 2001; Sanches, Pamplona, & Montevechi, 2005; Serguieva & Hunter, 2004; Sheen, 2005; Terceño, Andrés, Barberà, & Lorenzana, 2003; Tolga, Demircan, & Kahraman, 2005; Tsao, 2005; Yao, Chen, & Lin, 2005), to name a few. Several authors emphasize the advantages of using fuzzy theory associated with traditional capital budgeting methods under uncertainty, and over a hundred articles can currently be found in the fuzzy financial literature....

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