

## EXISTENCE OF STRONG VIABLE SOLUTIONS OF BACKWARD STOCHASTIC DIFFERENTIAL INCLUSIONS

MICHAL KISIELEWICZ

Faculty of Mathematics  
Computer Science and Econometrics  
University of Zielona Góra  
E-mail: M.Kisielewicz@wmie.uz.zgora.pl

**Abstract.** Existence of strong viable solutions for backward stochastic differential inclusions is considered. The paper contains the basic notions dealing with backward stochastic differential inclusions, some viable approximation theorem and existence viable theorem for backward stochastic differential inclusions.

**Key Words and Phrases:** Set-valued mappings, backward stochastic differential inclusions, viability problem, measurable selection theorem.

**2010 Mathematics Subject Classification:** 35A15, 35R99, 93E03, 93C30.

### REFERENCES

- [1] T.V. Benoit, T.X.D. Ha, *Existence of viable solutions for a nonconvex stochastic differential inclusions*, Disc. Math. DI, **17**(1997), 107-131.
- [2] R. Buckdahn, H.J. Engelbert, A. Răşcanu, *On weak solutions of backward stochastic differential equations*, Theory Probab. Appl., **49**(2000), 16-50.
- [3] F. Hiai, H. Umegaki H., *Integrals, conditional expectations and martingale of multivalued functions*, J. Math. Anal., **7**(1977), 149-182.
- [4] Sh. Hu, N.S. Papageorgiou, *Handbook of Multivalued Analysis I*, Kluwer Acad. Publ. Dordrecht, Boston, 1997.
- [5] M. Kisielewicz, *Differential Inclusions and Optimal Control*, Kluwer Acad. Publ., New York, 1991.
- [6] M. Kisielewicz, *Backward stochastic differential inclusions*, Dynamic Systems and Appl., **16**(2007), 121-140.
- [7] K. Kuratowski, C. Ryll-Nardzewski, *A general theorem on selectors*, Bull. Polon. Acad. Sci., **13**(1965), 397-403.
- [8] B. Øksendal, *Stochastic Differential Equations*, Springer-Verlag Berlin-Heidelberg, 1998.
- [9] P.H. Protter, *Stochastic Integration and Differential Equations*, Springer-Verlag, Berlin Heidelberg, 1990.
- [10] R.S. Lipcer, A.N. Shiryaev, *Statistics Stochastic Processes* (Polish), PWN, 1981.

*Received: March 5, 2012; Accepted: June 16, 2012.*