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# A method in demand analysis connected with the Monge–Kantorovich problem

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**Abstract.** A method in demand analysis based on the Monge–Kantorovich duality is developed. We characterize (insatiate) demand functions that are rationalized, in different meanings, by concave utility functions with some additional properties such as upper semi-continuity, continuity, non-decrease, strict concavity, positive homogeneity and so on. The characterizations are some kinds of abstract cyclic monotonicity strengthening revealed preference axioms, and also they may be considered as an extension of the Afriat–Varian theory to an arbitrary (infinite) set of 'observed data'. Particular attention is paid to the case of smooth functions.

**Key words:** demand function, budget set, insatiate demand, utility function, indirect utility function, rationalizing, strict rationalizing, inducing, strict inducing, Monge–Kantorovich problem (MKP) with a fixed marginal difference, cost function, constraint set of a dual MKP, concave function, strictly concave function, positive homogeneous function, superdifferential