The main topic of this thesis is the measures of weak non-compactness, which, in different ways, measure weak non-compactness of bounded sets in Banach spaces. Besides some known measures of weak non-compactness, we introduce new measures, that are more natural in some sense, and we show the relationships between them. We prove quantitative versions of Eberlein-Grothendieck, Eberlein-Šmulian, and James' theorems. Afterwards, we deal with measures of weak non-compactness of the unit ball and measures of weak non-compactness of sets in Banach spaces with w^*-angelic dual unit ball. We prove that in these cases some of the defined measures coincide. Finally, we focus on the behaviour of the defined measures while passing to convex and absolute convex hull. We prove quantitative version of Krein's theorem and we also prove that most of the measures do not change when passing to convex and absolute convex hull in Banach spaces with w^*-angelic dual unit ball.