Examples in the theory of continuous trading with friction

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Abstract. The purpose of this text is two-fold. First, we aim to present a description of a range of financial market models - from the well known classical frictionless models, through linear transaction cost dynamics, to only recently considered models where trading is subject to a superlinear friction - in which particular notions of arbitrage can be incorporated and analyzed. For all three models known arbitrage criteria are mentioned. These models emerged more or less chronologically one after the other, in the hope for better incorporating the physical symptoms of friction: a negative effect induced by consecutive transactions of high frequency and large volume. The setup is significantly different in terms of certain arbitrage related questions.

Second, we have constructed examples which show that in illiquid markets (where trading costs are a superlinear function of trading speed) it is more difficult to create arbitrage than in models where transaction costs are linear (or there are no such costs at all). We have achieved this by constructing price processes which allow riskless profit if trades can be executed infinitely fast but finite speed misses these opportunities. Our results help to clarify differences between various trading mechanisms in terms of the theory of arbitrage.