This paper investigates the profitability of technical trading rules in the Athens Stock Exchange (ASE), utilizing the FTSE/ASE-20 index over the period 1995-2008. We focus on a less developed and efficient stock market, given the existing paucity of research in such markets. The technical rules that are going to be explored are simple moving averages. We compare technical trading strategies in the spirit of Brock, Lakonishok and LeBaron (Journal of Finance, 1992), employing traditional t-test and bootstrap methodology under the generalized autoregressive conditional heteroskedasticity (GARCH) model. The results provide strong evidence on the profitability of those technical trading rules against the "buy and hold" strategy and contradict with the Efficient Market Hypothesis (EMH), since investors can gain abnormal returns.