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**Arash Fahim\*** ([fahim@math.fsu.edu](mailto:fahim@math.fsu.edu)), 1017 Academic Way, 208 J. Love Building, Department of Mathematics, Tallahassee, FL 32306, and **Nizar Touzi** ([nizar.touzi@polytechnique.edu](mailto:nizar.touzi@polytechnique.edu)), Centre de Mathematiques Appliquees, Ecole Polytechnique, UMR CNRS 7641, 91128 Palaiseau, Cedex, France. *Impact of the Carbon Market on Production Emissions.*

Since the creation of carbon emission markets, many questions have arisen about their effectiveness on reducing the pollution. We investigate the effect of carbon market in the production of a large polluter in two cases: when the firm cannot affect the risk premium of the emission market, and when it can change the risk premium by its production. In this simple model, we ignore any possible investment of the firm in pollution reducing technologies. We formulate the problem of optimal production by a stochastic optimization problem. Then, we show that, as expected, the market reduces the optimal production policy in the first case if the firm is not given a generous initial cheap allowance package. However, when the large producer activities can change the market risk premium, the cut on the production and consequently pollution cannot be guaranteed. In fact, there are cases in this model when the optimal production is always larger than expected, and an increase in production, and thus pollution, can increase the profit of the firm. We conclude that some of the parameters of the market which contribute to this effect can be wisely controlled by the regulators in order to diminish this manipulative behavior of the firm. (Received September 04, 2015)