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# The effect of cumulative versus random monetary incentives on market prices and traders expectations in a laboratory asset market experiment.

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## Abstract

In this paper, we employ a laboratory asset market experiment to investigate the effect of cumulative versus random monetary incentives on market prices and traders' expectations. We implement the experimental asset market paradigm pioneered by Smith et al. (1988) that has been used extensively to study price bubbles and crashes. In this paradigm, a group of subjects, who are endowed with some cash and some units of asset, trade an asset over  $T$  periods. At the end of each trading period, each unit of asset pays a dividend. The amount of dividend is determined uniformly randomly among the ex-ante known possible values in each period. The cash received as dividend payments can be used to trade asset in future periods. After the final dividend payment at the end of period  $T$ , the asset loses its value. Because the asset has no intrinsic value other than the stream of dividend payments, we can safely define its fundamental value in each period as the sum of its future expected dividend payments. In particular, the asset market experiment that we adopt consists of 6 traders who trade assets with a life of 10 periods. Each asset generates, at the end of each period, a dividend of either 24 or 48 ECU (Experimental Currency Unit) with an equal probability. We allow both short selling and borrowing. Indeed, each subject is initially endowed with 10 units of the asset and 3600 ECU, but according to short selling, in addition to the initial endowment, any trader can hold a short position up to 10 stocks at any time. Furthermore, in addition to the initial monetary endowment, another 3600 ECU are lent to each subject. This loaned amount must be returned in its entirety by each subject at the end of the last period. Furthermore, in each experiment, subjects experience the same 10 periods asset market twice with the same group of 6 traders. This repetition allows us to study learning among subjects across two consecutive and identical market conditions. Finally, at the end of the two asset markets, students answered a cognitive reflection test (CRT7 - Finucane and Gullion, 2010 and Toplak et al. 2014). We replicate the same asset market experiments under two payment rules. In one treatment (CUMUL rule), the subjects are aware that the final payment is the sum of the earnings for both asset markets. In the second treatment (RND rule) the subjects are informed that at the end of the experiment only one asset market randomly chosen will be paid. Therefore we ran 18 sessions in total corresponding to nine sessions of six traders (i.e. 54 subjects) for each treatment. In total, 108 students

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have been recruited at the LAMETA (experimental lab of the University of Montpellier) to participate at this experiment. We introduce also the elicitation of future price expectations of the subjects. We employ the method of forecast elicitation used by Haruvy et al. (2007) and Akiyama et al. (2014, 2015) in the call market framework, similar to the one introduced by van Boeming et al. (1993). Namely, at the beginning of each period, each subject predicts market prices for each future period of the ongoing market. This allows us to investigate the dynamics of both short-run and long-run price expectations. We compare subjects' expectations, as well as subjects' trading behavior and resulting market outcomes, under both payment conditions.

We are currently finalizing one working paper reporting all the experimental results that have been already obtained. We report in this extended abstract the list of research questions that we address in the papers. The paper findings can be discussed along two lines:

How price dynamics (the aggregate experimental outcome) are affected by the payment rule. The following questions are addressed.

Do cumulative payments increase or reduce price levels and/ or deviation from the fundamental value (mispricing) compared to random payment?

Do cumulative payments increase or reduce price fluctuations and volatility compared to random payment?

Do market prices become closer to the fundamental value (FV) as traders gain experiences and are there differences of learning between treatments?

What are the main drivers of the price dynamics? We investigate this issue at the market and individual levels by accounting for the elicited price forecasts. Thus, we explore the links between payment mechanism, individual expectations, fundamental values and prices.

Do cumulative payments increase or reduce the levels of price predictions compared to random payment?

Do cumulative payments modify the forecast deviations from the fundamental value (misforecasting) and from prices (ability to predict prices) compared to random payment?

Do cumulative payments modify beliefs' dispersion compared to random payment?

Are there differences of learning between the two treatments?

Finally, we investigate the presence of a treatment effect in the formation of trading strategies. We adopt the Haruvy et al. (2006) trading strategy classification (based on the De Long et al. (1990) theoretical model) where the traders, in a double auction market experiment, are partitioned in "passive" (or "fundamental value") traders, "feedback" (or "momentum") traders and "speculators" (or "rational speculators"). We further extend this standard classification by accounting for price forecasts. Thus, we provide a more refined definition of strategy types. We are then able to compare results between the two classifications and answer to the following issues:

Is there a consistency between traders' bid/ ask prices and their forecasts (i.e. do traders use their beliefs to trade) and differences between treatments?

Does belief dispersion affect the relative size of the price change?

Are the strategy types - taking into account forecasts - different from Haruvy et al. strategies?

Do cumulative payments or random payments modify the proportions of strategy's types?

**Keywords:** asset market, traders expectations