



## CERF Fellows Scheme

### Learning, networks and stock market participation

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Based on a novel survey data set from France, recent empirical literature (Arrondel, et. al., 2013) establishes that stock ownership and stock-market participation are strongly correlated with individuals' subjective expectations of stock market returns, which are in turn strongly correlated with the information set of the potential investors. Expectations of stock market returns are broadly hump-shaped in age. Young people are pessimistic about the stock market returns: as they enter adulthood at 18 years, less than 40% of them expect stock market returns to be positive five years ahead, but the percentage gradually increases as they become middle-aged. At the same time, the young people tend to be the least informed about stock market performance (this is documented by their wrong responses when asked about stock market performance in the recent past), but their information sets get enlarged as they grow older. The survey therefore suggests a clear link between age, the amount of information used to form subjective expectations about future stock market performance and stock market participation.

In collaboration with Dr Hector Calvo-Pardo, the research programme undertaken is motivated by these empirical observations and aims to address an array of questions related to these facts.

The first aim is to propose a theoretical framework that is consistent with the above findings. In this framework there is a large number of ex-ante identical dynasties, where agents' subjective expectations about the future performance of the stock market (e.g. expected stock price growth) endogenously determines current stock prices. The age profile of agents is determined as follows: at a given point in time, an agent retires with some probability and his offspring takes over and continues the dynasty. At that point in time, the offspring inherits the given amount of stocks accumulated by the parent, but not the parent's knowledge about the stock market (for example information on past realisations of returns, prices and dividends). In other words, every newly born agent 'resets' his information set. This assumption captures the empirical regularity that young agents are broadly uninformed about stock market performance. How do young agents accumulate knowledge/experience and form expectations about future returns? Methodologically, we assume that agents are 'internally rational' in the sense of Adam and Marcet (2011), i.e. they behave in an internally optimal way by maximising their own expected lifetime utility, but are not externally rational because they do not know the true stochastic process that governs stock returns which is external to their optimisation. As young agents start their life, their initial beliefs about the stock market are pessimistic (as observed in the data). Once stock market data is revealed to them, they update their beliefs through a well specified Bayesian learning process. Over time, and as young investors age and accumulate more data, their subjective beliefs converge in distribution to the correct (rational) beliefs about stock prices, returns and dividends.

The second aim of the project is to understand the impact of such pessimistic subjective beliefs of the uninformed young investors on the aggregate outcomes in the stock market. Preliminary



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analysis indicates some interesting asymmetric effects: asset price booms appear to be milder compared to sharp, severe and prolonged asset price busts. The aforementioned framework successfully generates the differences in subjective return expectations depending on the age of the investors, but does not generate any heterogeneity among agents of the same age (this is because by construction agents of the same age have the same information set). A third aim of the proposed research project is therefore to address this issue, and at the same time also propose an alternative mechanism for young investors to accumulate information on stock market performance. This is done by assuming that social network effects matter for forming subjective expectations about the stock market (there are numerous empirical contributions that support the notion that social interaction matters for stock market participation, see for example Hong, et. al. (2004) and Brown, et. al. (2008)). The novelty of our approach is that networks are explicitly embedded into the expectations formation and updating mechanism. This setting provides valuable insights about what types of network structures are compatible with the observed stock market participation rates of different age cohorts. It can also be very useful in understanding why subjective beliefs about stock market returns are misaligned for young agents. In other words it may provide a quantification of the speed of information accumulation and thus convergence (or not) to rational expectations.

The research programme is in progress and we soon expect to produce a working paper which will be submitted to international conferences in the next academic year.

### References

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