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Learning by aspiring professional traders: Learning to take risk



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ABSTRACT

This paper investigates evidence of learning among thousands of new entrants to a population of professional futures floor traders over a six-year period. We document several empirical regularities consistent with different types of learning. First, traders appear to rationally learn about ability: only about 15% of the traders survive more than one year. Second, as traders become experienced, they increase trading intensity. Third, on average, surviving traders exhibit increasing comfort with risk (tolerating larger potential losses) as they gain experience compared to traders with the same experience level who do not survive. However, despite evidence consistent with learning about ability, we find no evidence that traders improve their risk-adjusted performance as they gain experience. Other than learning about ability, we conclude that the fundamental skill traders learn is the ability to be comfortable with risk.

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1. Introduction

A common occupation in financial markets is that of “trader”. Trading, or proprietary position-taking in anticipation of a gain, generates a substantial proportion of earnings for many financial institutions, such as investment banks and hedge funds. In return, such trading generally provides liquidity to markets. Although it is an essential component of our market system, trading is typically not covered in business education where accounting, financial analysis and portfolio theory predominate. Traditional microstructure theories offer glimpses about what we expect traders *should* be doing, where traders are described as operating in a world of asymmetric information and inventory control. Nonetheless, the actual process of trading is learned on the job. Further, it appears that not everyone is born to trade.

Trading is a profession that requires some particular skill set: only a few traders achieve substantial financial success. With increased access to trader data, there is a nascent empirical literature on the nature and development of trading skills. In particular, several recent papers have examined trader learning. Using Finnish household data, Linnainmaa (2011) and Seru et al. (2010) find evidence that (non-professional) Finnish traders enter markets with unknown ability, then proceed to learn about their ability, with the result that traders who lose (those with lesser ability) money cease active trading. The Finnish evidence is consistent with the analytical model of rational trader learning in Mahani and Bernhardt (2007), where traders learn over time about their inherent abilities, or skills, in processing information related to the predictability of short-term price fluctuations.

Researchers using data from retail traders in Taiwan find evidence of less “rational” behavior. Barber et al. (2009) find “systematic and economically large losses” from trading by the Taiwanese population of retail stock traders, where the retail population systematically loses to (sophisticated?) institutional traders. Chiang et al. (2011)

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investigate bidding in IPO auctions, and find deteriorating retail trader performance over time,¹ consistent with naive reinforcement learning, or self-attribution models such as Gervais and Odean (2001). Apparently a little arbitrary success is dangerous.

We build on this literature, adding to the understanding of trader learning by investigating the performance of aspiring professional future traders as they enter the market. We exploit a rich database consisting of all personal account trades made in the CME's S&P 500 index futures market over a six-year period to identify 2959 new entrants to the market. We examine these nascent traders over time for evidence of learning. Our focus on the onset of traders' careers is consistent with Arrow's (1962) point that some learning is necessarily experiential, but that learning via experience is subject to "sharply diminishing returns".

We document several empirical regularities consistent with different types of learning. First, consistent with Seru et al. (2010) and Linnainmaa (2011), traders appear to rationally learn about ability, as many traders who lose money disappear rapidly. Second, traders increase their intensity as they gain experience, regardless of their eventual life in our sample. Third, surviving traders, those with over 250 days in the sample, exhibit increasing comfort with risk as they gain experience, compared to traders with the same experience level who eventually disappear.

A possible explanation for increased trader comfort with risk over time could be increased trader wealth. Overconfidence could be another explanation. In "learning to be overconfident", Gervais and Odean (2001) develop a model which predicts increased risk-taking as a function of past income among new traders. We directly investigate these alternative explanations by examining the role of cumulative and recent trading success – as measured by dollar gains – on contemporaneous trader activity. We find no evidence that trader activity is driven by past trading success, either cumulative or during the preceding five trading days. The data provide no support for "learning to be overconfident" among this population of aspirant professional traders. These results confirm that increasing trader comfort with risk over time is not driven by increased wealth or increased (over)confidence based on past success.

Despite evidence consistent with learning about ability (the rapid exit of the majority of the entering traders), and learning to be more comfortable with risk (increasing position size and potential loss per contract as experience increases), we find no evidence that risk-adjusted trading performance improves over time among the surviving traders. There is little evidence of trader improvement over time in a sense other than increasing comfort with risk (and a reduction of the number of poor traders). Traders make more money as they gain experience, but they also take on a commensurate amount of risk.

Overall, we consider these results to be consistent with rational learning about ability, as in the models of Mahani and Bernhardt (2007) and Linnainmaa (2011). In these models, as traders learn about their ability, they increase risk-taking as a rational response to increased estimates of that ability, rather than as a result of overconfidence. We interpret our findings as largely consistent with a process described by Mahani and Bernhardt (page 1315, footnote 1):

Each year, large financial firms hire new finance graduates. The new hires trade on a small "testing" scale. Based on their performance, most are fired, but survivors trade on a larger scale and show better performance than average.

The remainder of the paper is structured as follows. Section 2 describes the data and methodology, and provides descriptive statistics for the trader data. Section 3 provides analysis of the relationship between experience and trader income, trading intensity, and risk exposure. The last section concludes.

2. Data and preliminary statistics

We obtain audit trail records for all trades in S&P 500 index futures from 1996 through 2001 from the Commodity Futures Trading Commission ("CFTC"). The base data is referred to as the computerized trade reconstruction, a required feed from the exchanges to the CFTC. We have the masked identity (badge) of the members who were trading, and select the trading of those members when executing proprietary trades.² We define an entrant as a trader who is in our data set executing proprietary trades and who did *not* execute a proprietary trade in January 1996, the first month of our sample. Traders enter throughout the time frame of our sample. Some of these entering traders traded for a few days, several for the remainder of the sample period after they enter. Altogether there were 2959 entrants who traded during regular "pit" trading hours. Of these 1136 were still trading in December 2001, and 1823 were no longer trading in December 2001. As a frame of reference for survivability, of the 489 observed proprietary traders in January 1996 (non-entrants), there were 344 traders who also traded in December 2001. Our information on each trader is limited to the trade data.

For these 2959 entrants, we provide some descriptive statistics in Table 1. For each trader each day on which they trade (this is our trader day) we calculate volume (the maximum of buys and sells) and income (the volume-weighted difference between buying and selling prices, marking any end-of-day positions to market at closing prices). Volume is in original contract equivalents and includes Emini trading.³ We define survivorship or lifetime

² The traders identify the principal behind every trade they execute. If the trader owns more than 10% of the firm identified as the principal, or is the sole principal, this is referred to as a Customer Trade Identification (CTI) of "1".

³ The original S&P 500 contract had a multiplier of \$500 per index point. On November 1, 1997 the CME "split" the regular S&P 500, reducing the multiplier to \$250 a contract. The Emini has always been \$50 an index point. By defining volume in terms of the \$500 multiplier, we define a trade of 50 Emini contracts as volume of 5 contracts.

¹ Their original working title was "Learning to fail". In contrast to the retail traders, Chiang et al. find no evidence of deteriorating performance among the institutional traders.

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