

# Why Do People Trade?<sup>1</sup>

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*Besides trading to save, manage risk, and speculate, people trade simply because they find it entertaining. In a survey of 1,300 German discount brokerage clients, respondents who indicate that they "enjoy investing" and "enjoy risky propositions" trade twice as much as their peers. In contrast, standard motives for trading such as saving and rebalancing explain little of the variation in trading activity across investors. Entertainment appears to be a straightforward explanation for why some people trade much more than others and why active traders underperform their peers after transaction costs.*

■ Trading in financial markets is an important economic activity. Trades are necessary to get into and out of the market, to put unneeded cash into the market, and to convert back into cash when the money is wanted. They are also needed to move money around within the market, to exchange one asset for another, to manage risk, and to exploit information about future price movements. All this trading performs the

important social function of incorporating information into asset prices. It also (viewed from certain quarters more importantly) provides a major source of revenue for securities firms.

In this paper, we explore reasons investors trade that go beyond assembling a portfolio with the best return-risk profile. We argue that in exchange for this major source of revenue, securities firms are also allowing traders to enjoy themselves in the act of trading. Some investors view trading as a hobby, and hand over their large trading fees as happily as an audiophile pays top dollar for the latest in speaker technology. Other investors, we find, are playing the market in a very literal sense, racking up trading costs like a casino patron sliding his chips across the table.

We make these characterizations in an attempt to explain three stylized facts about trading that have caught the attention of researchers and practitioners alike:

1. Trading volume in financial markets is high. For example, stocks in the US change hands roughly once per year.

2. Trading volume is concentrated among a small number of market participants. In a well-cited study of US discount brokerage clients, Barber and Odean (2000) report that the most active investors turn over their portfolio several times per year. In contrast, a substantial fraction of US individual investors with a brokerage account do not trade at all in a given year, according to recent waves of the US Survey of Consumer Finances.

3. Traders underperform buy-and-hold investors. Barber and Odean (2000) report that the most active investors underperform the least active investors by several percentage points per year and that the performance differential is essentially due to trading costs.

Standard economic theory appears to be at odds with these facts. The rational investor assumed by standard theory is only interested in the return and risk attributes of his portfolio,

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and only trades if the benefits from trading justify the costs. In general, return maximizing rational investors should be very reluctant to trade with one other. The intuition is simple. Trading is a zero-sum game. If rational investor A offers to trade with rational investor B, B should be suspicious that A knows something about the future price that B does not. Milgrom and Stokey (1982) and Tirole (1982) formalize this intuition and show that indeed, rational investors should refuse to speculatively trade with each other.

The inadequacy of standard theory opens the door for the behavioral approach. De Bondt and Thaler (1995) call the observed trading volume in financial markets “perhaps the single most embarrassing fact to the standard finance paradigm.” The leading answer of the behavioral camp to the question “Why do people trade?” is overconfidence, prominently advocated by Odean (1998). Essentially, overconfidence allows both parties to a trade to believe that they will win the zero-sum game of trading. For all its intuitive appeal, the overconfidence hypothesis has received only mixed empirical support. Barber and Odean (2001) report that male US discount brokerage clients trade more than their female counterparts and interpret this finding as consistent with the overconfidence hypothesis. Grinblatt and Keloharju (2008) use self-confidence assessments from a psychological test administered by the Finnish military to infer overconfidence of male Finnish investors. They report that the univariate correlation between the self-confidence score and trading activity is close to zero. Other things equal, however, the proxy for overconfidence derived from the self-confidence assessments is significantly positively related to the number of trades, though not to portfolio turnover. Glaser and Weber (2003) use a questionnaire to elicit nine proxies for overconfidence in a sample of German discount brokerage customers and relate the proxies to actual portfolio turnover. None of the proxies help explain cross-sectional variation in portfolio turnover. In trading experiments with students from different countries, Deaves, Lüders, and Luo (2004), and Biais, Hilton, Mazurier, and Pouget, (2005) report little or no relation between proxies for overconfidence and observed trading activity.

This paper explores a different explanation of why people trade, anticipated by Black (1986) who notes that “[w]e may need to introduce direct utility of trading to explain the existence of speculative markets.” For people who trade because they like to do so, the monetary cost of trading is offset by non-pecuniary benefits from researching, executing, talking about, anticipating the outcome of, or experiencing the outcome of a trade.

Motives for entertainment trading can be classified in three distinct groups: recreation, sensation seeking, and an aspiration for riches.

Recreational trading can be motivated by a feeling of

accomplishment (similar to a homeowner who decides to do it himself rather than hiring a contractor), camaraderie (among members of an investment club, for example), or it can emerge as a by-product of following the financial markets as a hobby (like a technophile who likes to read reviews of the latest gadgets, and is then tempted to go out and buy them).

Perceiving investing as a diversion rather than a chore, hobby investors have less of a psychological hurdle to overcome when executing changes to their portfolio, directly lowering their marginal cost of trading. By actively following the financial markets, they also expose themselves to more trading signals and should hence be expected to trade more than their peers.<sup>2</sup>

Entertainment trading can also be motivated by sensation seeking in the financial domain. According to Zuckerman (1994), “Sensation seeking is a trait defined by the seeking of varied, novel, complex, and intense sensations and experiences, and the willingness to take [...] financial risks for the sake of such experience.” In a (perhaps subconscious) quest for arousal, sensation seekers look for both intensity and novelty in experience. An undiversified portfolio of volatile stocks exposes its holder to intense stimuli in the form of extreme returns. Exposure to such stimuli by itself may trigger trading as argued by Dorn and Huberman (2007). In addition, as pointed out by Grinblatt and Keloharju (2008), sensation seekers in the financial domain may value the act of trading in and of itself because a trade — a new bet — affords the desired novelty of experience. Grinblatt and Keloharju (2008) use traffic violations to proxy for thrill seeking behavior; they report that variation in the number of speeding tickets explains variation in trading activity in a large sample of Finnish investors.

Alternatively, trading can be motivated by an aspiration for riches as suggested by Statman (2002). A trade can be seen as a bet that carries a “dream value,” that is, the joy of imagining what a handsome payoff will buy. Such aspirations have been used to explain lottery participation (Conlisk, 1993) and exploited in advertising by retail brokers (Barber and Odean, 2002). Aspiration-driven investors should hold portfolios with volatile and positively skewed returns to increase the chance of reaching an aspiration level far above their current wealth (see Kumar, 2008). The exposure to trading stimuli in the form of extreme returns, coupled with an inherent impatience to reach their desired wealth level, may lead aspiration-driven investors to pick up and abandon trading ideas more quickly than their peers.

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<sup>2</sup>This argument is reminiscent of Merton (1987) who motivates his 1986 Presidential Address to the American Finance Association by the simple observation that an investor needs to know about a stock before he can trade it.

The paper examines the hypothesis that entertainment motives drive trading by combining survey responses and transaction records for a sample of more than 1,000 clients at one of the top three discount brokers in Germany. The survey offers responses to statements that elicit whether a respondent enjoys investing and statements that have been used to identify compulsive gamblers. The responses to these statements serve as proxies for the entertainment benefits derived from trading.

The main findings are as follows:

1. Standard motives for trading fail to explain much of the observed trading activity. Turnover due to savings, dissavings, liquidity, and rebalancing considerations accounts only for about one third of total turnover.

2. Standard motives for trading fail to explain why some people trade much more than others. Turnover due to savings, dissavings, liquidity, and rebalancing considerations varies much less across investors than turnover that cannot be justified by standard trading motives.

3. Entertainment appears to be a major driver of portfolio holdings. Entertainment-driven investors hold more concentrated portfolios, riskier portfolio components, and portfolios with more positively skewed returns.

4. Entertainment appears to be a major driver of portfolio turnover, especially turnover that cannot be justified by standard trading motives. Entertainment-driven investors turn over their portfolio of stocks, bonds, funds, and options at roughly *twice* the rate of their peers.

5. Proxies for overconfidence are at best weakly correlated with trading activity.

The remainder of the paper proceeds as follows: Section I describes the data and the construction of the variables. Section II discusses the main findings in more detail. Section III concludes.

## I. The Data

### A. Brokerage Records

The analysis is based on a complete history of daily transaction records in individual stocks, term deposits, bonds, mutual funds, and options obtained for a sample of 1,345 current and former clients at one of Germany's three largest discount brokers between January 1, 1995 and May 31, 2000.<sup>3</sup>

<sup>3</sup>The broker is labeled as a discount broker because no investment advice is given.

In addition to the standard trade attributes, the records include a channel variable that indicates whether the order was placed over the phone, over the internet, or within an automatic investment or withdrawal plan that exist for dozens of individual stocks and mutual funds. Such plans allow investors to gradually build or reduce positions at four dates each month (similar to ShareBuilder in the US).

In July and August 2000, after the sample period, each investor participated in a survey that elicited a wide range of objective and subjective investor attributes detailed below. Table I summarizes the client portfolios and trading activity during the sample period January 1995 to May 2000.

Average monthly turnover, defined as one half the sum of the absolute values of purchases and sales during a given month divided by the average portfolio value during that month averaged first across time for each investor and then across investors, is 15%. In our turnover calculation, we consider purchases and sales of individual stocks, individual bonds, mutual funds, options, and term deposits. Individual stock trades account for 62%, fund trades account for 18%, and option trades account for 15% of the total trading volume during the sample period. The average portfolio size over the entire account life is roughly 90,000 Deutsche Mark [DEM] or 50,000 US dollars [USD] at the average USD/DEM exchange rate of 1.7 during the sample period.

We analyze the portfolios using a measure of concentration known as the Herfindahl-Hirschmann Index (HHI).<sup>4</sup> The median HHI of the stock and fund portfolios during the sample period is 31%; that is, the typical client holds the equivalent of an equally-weighted portfolio of three individual positions.

From the information provided by the client to the broker at account opening, we can infer the gender of all main account holders and the age of those who choose to report their birth date. The typical respondent is male, young, and has held the account for three years. Judging from a survey of Germans who hold stocks, either directly or through mutual funds (see Deutsches Aktieninstitut, 2000), our sample investors are more predominantly male and younger than the

<sup>4</sup>The HHI is defined as the sum of squared portfolio weights. A portfolio consisting of  $n$  equally-weighted stocks would have an HHI of  $1/n$ . Stock mutual funds are assumed to consist of one hundred equally-weighted positions that do not overlap with other holdings of the investor. That is, the HHI of portfolio of an investor holding one stock mutual fund is 1% and that of an investor splitting his money equally between two stock mutual funds is 0.5%.

**Table I: Summary Statistics**

Portfolio characteristics are calculated from the complete daily transaction history available for each of the 1,345 sample investors from the day when the account was opened until May 31, 2000 or the day when the account was closed, whichever comes first. Turnover in a given month is the sum of the absolute value of purchases and sales of stocks, bonds, mutual funds, and options divided by twice the higher of the portfolio value at the beginning or at the end of the month (to avoid extreme values). Average portfolio value is calculated at the end of every month across all individual stocks, funds, options, bonds, and term deposits in the client's portfolio. During the sample period, one US Dollar [USD] corresponds to roughly Deutsche Mark [DEM] 1.7. The Herfindahl-Hirschmann Index (HHI) is calculated using only stocks and stock mutual funds for which Datastream offers a complete history of non-stale prices and returns. Higher values of the HHI indicate less diversification. "Gender" is a dummy variable that is one if the respondent reports to be male and zero otherwise (if missing, we replace the missing value with the gender recorded for the main account holder in the brokerage database). "Age" is the age of the respondent (if missing, we replace the missing value with the age recorded for the main account holder in the brokerage database). "College" is a dummy that is one if a respondent has a college degree and zero otherwise. "Self-employed" is a dummy that is one if the respondent reports to be self-employed and zero otherwise. "Income" is the self-reported gross annual income. "Wealth" is the self-reported total net worth (including all financial assets and real estate).

<b>Portfolio Characteristics</b>	<b>Mean</b>	<b>Median</b>
Average monthly portfolio turnover	15%	7%
Average portfolio value [DEM]	86,000	38,000
Average Herfindahl-Hirschmann Index	31%	25%
<b>Investor Characteristics</b>		
Gender [fraction male]	88%	
Age	39	36
Education [fraction with college education]	70%	
Self-employed	17%	
Gross annual income [DEM]	93,000	88,000
Net worth [DEM]	373,000	325,000

typical German stock market participant. Relative to the population of German stock market participants, the sample investors also appear to be more highly educated and earn higher incomes (see Dorn and Huberman, 2005).

## B. Survey Variables

To gauge which investors likely derive non-pecuniary benefits from their trading activities, we use their self-reported attitudes towards investing and gambling gleaned from a survey administered in July and August 2000. The survey elicited information on the investors' investment objectives, risk attitudes and perceptions, investment experience and knowledge, portfolio structure, and demographic and socio-economic status. Dorn and Huberman (2005) describe the survey in detail.

To pin down the importance of entertainment motives for different investors, we focus on the survey items that make an explicit reference to whether or not respondents *enjoy* dealing with their investments or *enjoy* gambling. This focus yields responses to a total of four statements (reproduced below in translation from the original German). The investors are asked to indicate their agreement with the four statements

on a five-point scale ranging between (1) strongly disagree, (2) tend to disagree, (3) tend to agree, (4) strongly agree, and (5) don't know:

1. I enjoy investing.
2. I enjoy risky propositions.
3. Games are only fun when money is involved.
4. In gambling, the fascination increases with the size of the bet.

Agreement with statement one defines a hobby investor. Agreement with statements two to four identifies respondents who enjoy risky propositions, in general, and gambling, in particular; in fact statements three and four are taken from a study on identifying compulsive gamblers (Nadler, 1985). Hobbyists and gamblers appear to form distinct groups; the response to the first statement is only weakly correlated with the responses to the other statements. Statements two through four flag investors as gamblers more or less consistently; the pairwise correlation between the responses to statements two to four is quite high and reaches 0.46 between statements three and four.

Table II summarizes objective demographic and socio-economic attributes of investors grouped by their responses

**Table II: Characteristics of Entertainment-Driven Investors**

Panels A through D characterize investors grouped by their responses to four survey statements designed to elicit whether the respondents enjoy investing or gambling with money. The investors are asked to indicate their agreement with the four statements on an ordinal scale of (1) strongly disagree, (2) tend to disagree, (3) tend to agree, (4) strongly agree. In Panel A, we have combined the categories (1) and (2) to “disagree” since only four respondents choose to “strongly disagree.” In Panel D, we have combined the categories (3) and (4) to “agree” since only thirty-eight respondents choose to “strongly agree.” “Nobs” is the number of respondents in each category. The demographic and socio-economic variables are defined as in Table I.

	<b>Nobs</b>	<b>Gender</b>	<b>Age</b>	<b>College</b>	<b>Self-employed</b>	<b>Income</b>	<b>Wealth</b>
<i>Panel A - Statement 1: “I enjoy investing.”</i>							
Disagree	84	76%	40	73%	15%	90	262
Tend to agree	403	87%	41	72%	17%	94	358
Strongly agree	822	91%***	41	69%	16%	94	396***
<i>Panel B - Statement 2: “I enjoy risky propositions.”</i>							
Strongly disagree	148	82%	48	69%	13%	85	421
Tend to disagree	571	88%	41	70%	16%	93	385
Tend to agree	492	90%	39	70%	17%	97	357
Strongly agree	87	95%***	37***	75%	21%	102**	330*
<i>Panel C - Statement 3: “Games are only fun when money is involved.”</i>							
Strongly disagree	470	87%	41	76%	14%	91	387
Tend to disagree	487	89%	41	66%	17%	94	381
Tend to agree	277	92%	40	67%	19%	97	351
Strongly agree	71	87%	38*	62%**	22%	84	282**
<i>Panel D - Statement 4: “In gambling, the fascination increases with the size of the bet.”</i>							
Strongly disagree	674	89%	41	72%	16%	95	392
Tend to disagree	396	88%	41	68%	18%	90	364
Agree	199	90%	39**	65%*	18%	94	329**

\*\*\*Significant at the 0.01 level

\*\*Significant at the 0.05 level.

\*Significant at the 0.10 level.

to the above statements. We exclude the few investors with missing responses and investors who respond with “don’t know”—out of a total of 1,345 respondents, the number of missing responses ranges from 10 (for statement three) to 15 (for statement one); the number of respondents who respond with “don’t know” ranges from 11 (for statement one) to 56 (for statement four). To be able to make meaningful statistical comparisons across groups, we group investors who “strongly disagree” with statement one together with those who “tend to disagree” as there are only four investors who “strongly disagree.” For the same reason, we combine the “strongly

agree” and “tend to agree” categories for statement four as only 38 investors “strongly agree.”

Male investors and wealthier investors appear to enjoy dealing with investments more than their female and less wealthy counterparts. Those who enjoy games only when money is involved, in particular, tend to be younger, less well educated, and less wealthy. Although we have no direct information about whether our sample investors engage in gambling outside the stock market, it is interesting to note that younger age, a lower level of education, and less wealth have been linked to a higher propensity to participate in legal

forms of gambling in Germany (see Albers and Hübl, 1997), the UK (see Farrell and Walker, 1999), and the US (see Clotfelter and Cook, 1989).

## II. Main Results

It is our task in this section to show that the high trading levels laid out in the stylized facts with which we began the paper are due to investors trading for entertainment motives. We will demonstrate that that small group of investors who exhibit high turnover and lagging returns is composed of those individuals who find trading entertaining, those individuals whose survey responses label them as hobby or gambling investors. Dorn and Sengmueller (2008) go on to document that these results are not driven by survey response bias, past returns, or small accounts.

### A. Standard Motives Inadequately Explain the Observed Trading Activity

We divide the turnover we observe in our sample into two finer measures: normal turnover and excess turnover. Normal turnover consists of trading that can be explained by standard motives for trading such as savings, dissavings, liquidity, or rebalancing considerations; excess turnover is the portion of total turnover that cannot be explained by these motives.

Similar to Barber and Odean (2002), we define an excess sale as a sale of a complete position of an individual stock, mutual fund, or option that is followed by one or more stock, fund, or option purchases within three weeks of the sale. We define excess purchases as all stock, fund, and option purchases made within three weeks of an excess sale. All other trades are classified as normal trades.<sup>5</sup> In particular, all trades in term deposits and automatic investment and withdrawal plans — plans that allow investors to gradually build or reduce positions in dozens of stocks and funds at four predetermined dates per month — are classified as

normal as they are likely motivated by liquidity and savings considerations.<sup>6</sup>

Our trade classification likely overstates normal turnover, in part because we only observe part of the portfolio for some investors. For example, an investor might sell off a complete position of stock A in an unobserved account and invest the proceeds in stock B in the observed account because he expects stock B to outperform stock A; such a purchase would be classified as a normal trade even though it is not driven by savings, liquidity, or rebalancing motives.

Table III reports summary statistics for normal and excess turnover. Across the sample respondents, the average monthly total turnover of 15% consists of 5% normal turnover and 10% excess turnover — in other words,

only one third of the observed trading volume can be explained by savings, liquidity, and rebalancing motives.

The standard deviation of normal turnover across the sample respondents is 4% as opposed to 29% for excess turnover. Therefore, the challenge in explaining the heterogeneity in trading activity across investors appears to lie in understanding excess turnover; investors appear to be fairly homogenous in their desire to trade due to savings, liquidity, or rebalancing motives.

### B. Cross-sectional Differences in Portfolio Characteristics Are Consistent With the Entertainment Hypothesis

Table IV sets out the portfolio characteristics of investors, separated by their responses to our four statements. We find that those investors who are most excited by risk indeed hold more risky portfolios.

Self-professed gamblers in our sample hold more concentrated equity portfolios. For example, those who strongly agree with the statement “I enjoy risky propositions” hold equity portfolios with an average HHI of 0.39 which corresponds to an equally weighted position in two to three individual stocks; by contrast, their peers who strongly disagree with this statement hold the equivalent of an equally

<sup>5</sup>We have explored variations of this definition in unreported robustness checks. For example, one could argue that the complete sale of an individual stock position followed by the purchase of a stock mutual fund constitutes a diversifying and hence normal trade. One could also argue that put purchases are used for portfolio insurance purposes. Since most trading occurs in individual stocks and call options, these variations in the definition of excess turnover have little effect on our results.

<sup>6</sup>Barber and Odean (2002) use the terms “non-speculative” and “speculative” trades instead of normal and excess trades. Substantively, our classification differs from theirs in three ways. First, they restrict their analysis to trades in common stocks. Second, they require that sales be for a profit to rule out tax-loss motivated trading (capital gains from sales of financial securities are essentially not taxed in Germany). Third, they do not distinguish between savings plan and non-plan trades.

**Table III: Normal Turnover Versus Excess Turnover**

Normal turnover in a given month is defined as one half the sum of the absolute values of normal purchases and normal sales during a given month divided by the average portfolio value during that month. Excess turnover is defined similarly, but using excess purchases and excess sales. An excess sale is defined as a sale of a complete position of an individual stock, mutual fund, or option that is followed by one or more stock, fund, or option purchases within three weeks of the sale. An excess purchase is defined as a stock, fund, or option purchase made within three weeks of an excess sale. All other trades are classified as normal trades. In particular, all trades in term deposits and automatic investment and withdrawal plans are classified as normal.

	<b>Mean</b>	<b>Std</b>	<b>Median</b>
Average monthly portfolio turnover	15%	32%	7.4%
thereof:			
normal turnover	5%	4%	3.9%
excess turnover	10%	29%	2.9%

**Table IV: Portfolio Choices of Entertainment-Driven Investors**

HHI is the average Herfindahl-Hirschmann Index across the portfolios in the group, higher values indicate less diversification. Average component volatility (ACV) is the value-weighted average volatility of the portfolio components in an investor's portfolio. Realized skewness is calculated from daily portfolio returns as in Chen et al. (2001). "Options" is the fraction of respondents in a group that have traded options at some point during the sample period. HHI, ACV, and skewness are calculated using only the individual stocks and stock mutual funds for which Datastream provides daily total return data.

	<b>Nobs</b>	<b>HHI</b>	<b>ACV</b>	<b>Realized Skewness</b>	<b>Options</b>
<i>Panel A - "I enjoy investing."</i>					
Disagree	84	30%	42%	0.92	18%
Tend to agree	403	30%	42%	0.50	29%
Strongly agree	822	31%	45%	0.74	41%***
<i>Panel B - "I enjoy risky propositions."</i>					
Strongly disagree	148	26%	39%	0.45	22%
Tend to disagree	571	28%	41%	0.45	29%
Tend to agree	492	33%	48%	0.91	46%
Strongly agree	87	39%***	52%***	1.32***	51%***
<i>Panel C - "Games are only fun when money is involved."</i>					
Strongly disagree	470	28%	42%	0.63	30%
Tend to disagree	487	30%	43%	0.52	34%
Tend to agree	277	34%	48%	0.87	46%
Strongly agree	71	38%***	53%***	1.07	52%***
<i>Panel D - "In gambling, the fascination increases with the size of the bet."</i>					
Strongly disagree	674	28%	42%	0.53	31%
Tend to disagree	396	32%	45%	0.77	42%
Agree	199	37%***	50%***	0.96**	47%***

\*\*\*Significant at the 0.01 level

\*\*Significant at the 0.05 level.

weighted portfolio of four stocks.

Not only are the portfolios of gamblers more concentrated, but they also consist of individually riskier securities. For example, the average component volatility — the value-weighted average of the annualized volatility of the stock portfolio components — of investors who strongly agree with the statement “I enjoy risky propositions” averages 52% relative to 39% for investors who strongly disagree with this statement.

Consistent with gamblers preferring skewness (see Golec and Tamarkin, 1998), people classified as gamblers in our data set hold portfolios of stocks and mutual funds that exhibit more positively skewed returns. We exclude holdings of individual bonds and options when calculating portfolio statistics, in part because of a lack of high-frequency price data. However, options holdings and trades also point to entertainment-motivated investors preferring securities with positively skewed payoffs. For example, half of the investors who strongly agree with the statement “I enjoy risky propositions” trade options during our sample period; in contrast, only one out of five investors who strongly disagree with this statement also trade options.

### **C. Cross-sectional Differences in Turnover Are Consistent With the Entertainment Hypothesis**

Trading is costly. The typical respondent in the paper’s sample spends 0.5% of his self-reported gross annual income on trading commissions. The main hypothesis entertained here is that some investors derive non-pecuniary benefits from researching, executing, talking about, anticipating, or experiencing the outcome of a trade. These benefits help offset the cost of trading.

We group the survey respondents by their responses to each of the four entertainment statements. Figures 1-4 illustrate the equally-weighted average monthly turnover rates for the members of each group. Investors who report enjoying investing also trade more aggressively than their peers. Figure 1 shows that investors who strongly agree with “I enjoy investing” exhibit an average monthly turnover of 17% — significantly higher than the average turnover rate of 10% for the investors who disagree with the statement. Similar turnover patterns are obtained for investors grouped by their responses to statements that elicit the investor’s affinity to gambling (see Figures 2-4). For example, investors who strongly agree with “Games are only fun when money is

involved” turn over their portfolios at an average monthly rate of 24% — twice the rate of those who strongly disagree with the statement (see Figure 3).

If differences in trading activity were indeed driven by entertainment, one would expect such differences to manifest themselves in terms of excess turnover; that is, turnover unlikely due to savings, liquidity, or rebalancing considerations. Indeed, Figures 1-4 also show that virtually the entire difference in total turnover between those who enjoy investing or gambling and their peers is due to the higher excess turnover of the entertainment-driven investors. For example,

investors who strongly agree with “Games are only fun when money is involved” exhibit normal turnover rates averaging 5% — similar to the average normal turnover of 4.5% of their peers who strongly disagree with the statement. However, the average excess turnover rate of the self-professed gamblers, 19%, is almost thrice the corresponding rate of their peers (see Figure 3).

In Dorn and Sengmueller (2008) we investigate whether these correlations between turnover and entertainment motives hold up under multivariate statistical analysis. And indeed we find that even after controlling for gender, age, education, income, employment status, and wealth, investors who enjoy investing or gambling trade more than those who enjoy neither, and investors who enjoy both trade the most of all.

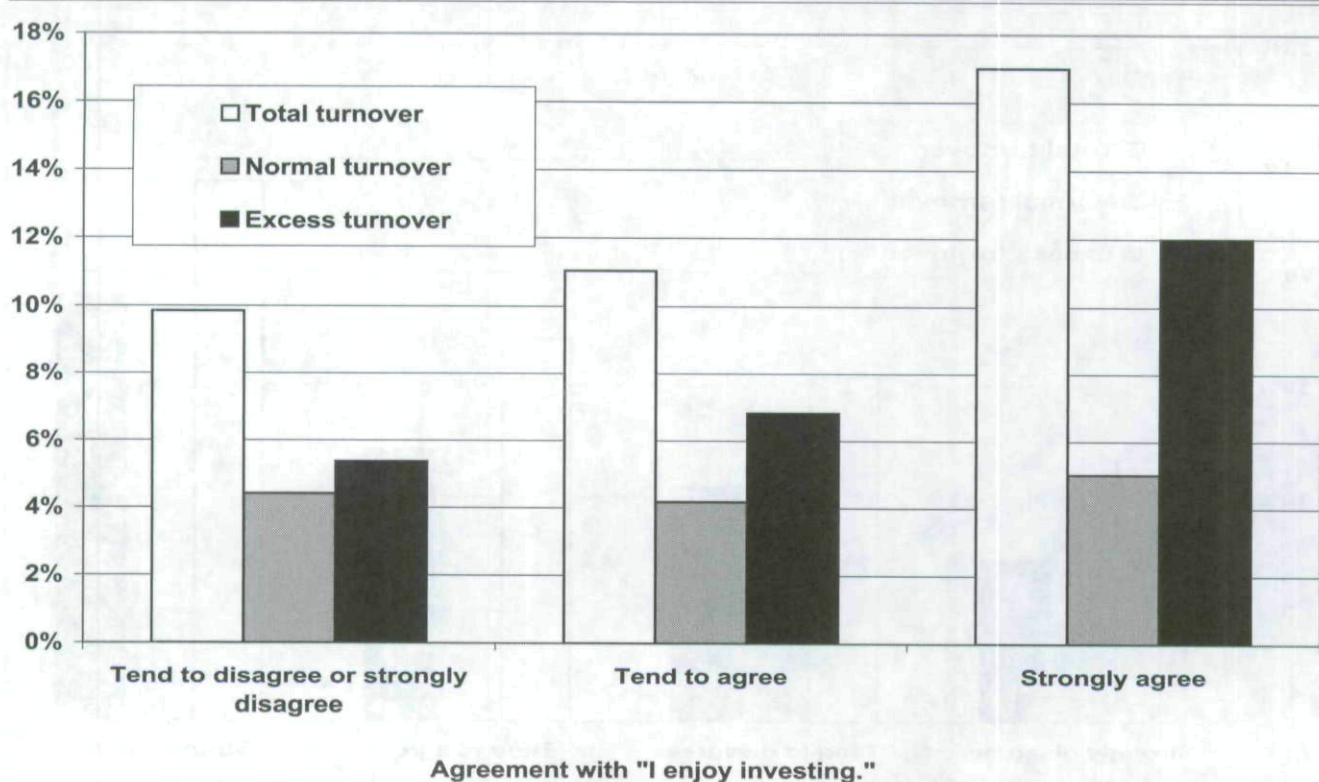
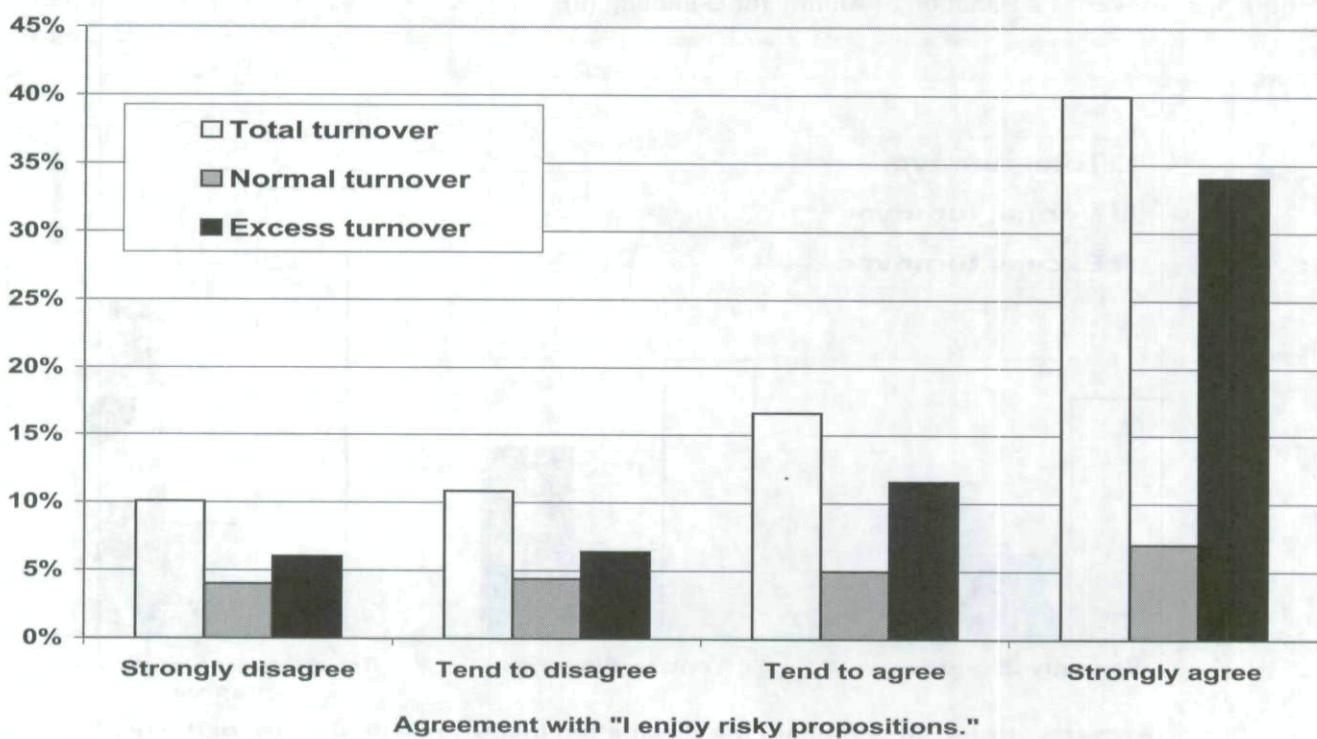
These results suggest that investors appear to derive pleasure from trading both as a pastime and as a form of gambling. Figure 5 illustrates that respondents who enjoy investing (that is, they strongly agree with the statement “I enjoy investing”) but not gambling (that is, they disagree or strongly disagree with the statement “Games are only fun when money is involved”), and those who enjoy gambling but not investing trade more than their peers who enjoy neither investing nor gambling; those who enjoy both investing and gambling trade the most.

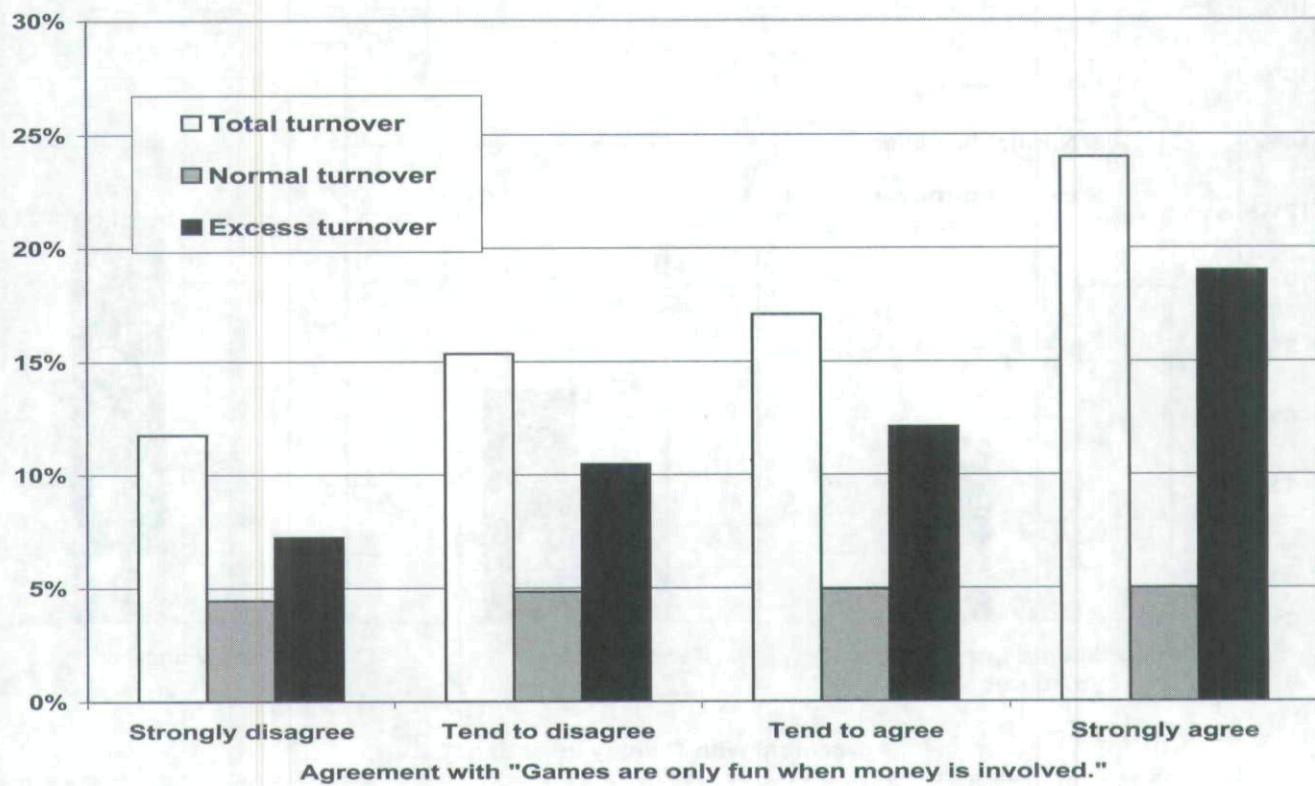
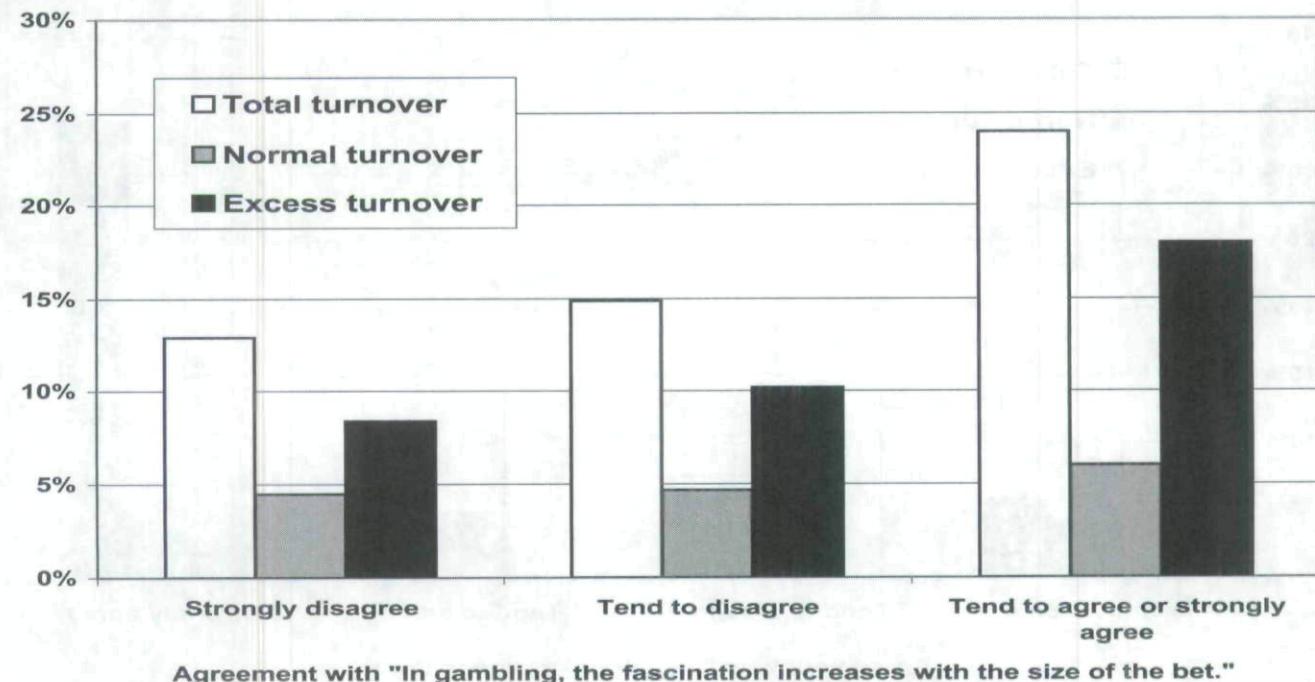
### **D. Differences in Overconfidence Fail to Explain Turnover Differences**

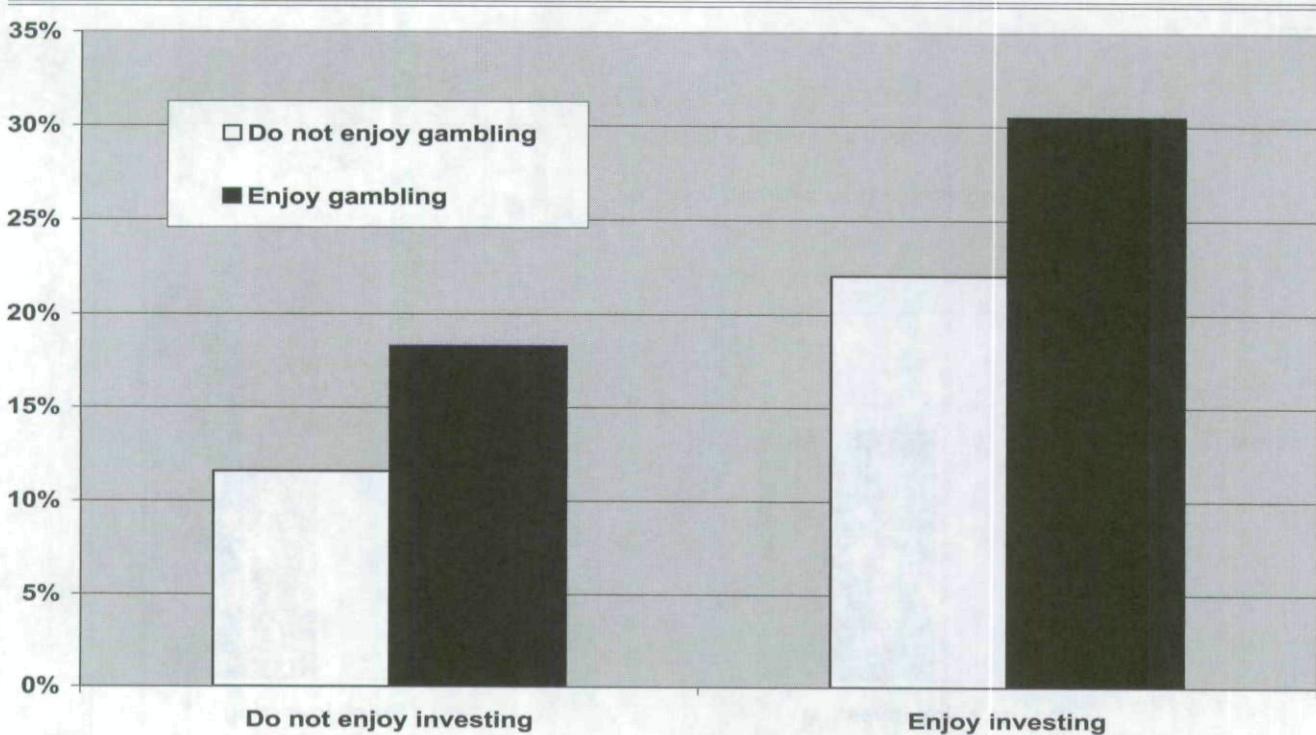
Overconfidence might explain the paper’s results if overconfident investors report enjoying trading because they enjoy doing what they wrongly perceive themselves to be good at. Alternatively, entertainment might amplify the effects of overconfidence or vice versa.

The wealth of survey responses allows us to construct three

## **Entertainment as a motive for trading is distinct from overconfidence. Proxies for overconfidence are at best weakly correlated with trading activity.**

**Figure 1: Turnover as a Function of Enjoyment of Investing****Figure 2: Turnover as a Function of Enjoyment of Risky Propositions**

**Figure 3: Turnover as a Function of Affinity for Gambling (I)****Figure 4: Turnover as a Function of Affinity for Gambling (II)**

**Figure 5: Excess Turnover of Investors Sorted by Enjoyment of Investing and Gambling**

proxies that capture different aspects of overconfidence: the tendency to overestimate one's knowledge, the tendency to overly attribute successes to skill in conjunction with past returns (known as the self-enhancing attribution bias), and the erroneous expectation of being able to affect chance outcomes (known as the illusion of control; see also Barber and Odean, 2002; Daniel et al., 1998; and Gervais and Odean, 2001).

We use the investor's agreement with the statement "I'm much better informed than the average investor" as a proxy for the tendency to overestimate one's knowledge, or relative knowledge. To estimate the self-enhancing attribution bias, we consider the extent to which survey participants agree with the statement "My past investment successes were, above all, due to my specific skills." To construct a proxy for the illusion of control, we compute an aggregate score using the investors' responses to four statements:

1. When I make plans, I am certain that they will work out.
2. I always know the status of my personal finances.
3. I am in control of my personal finances.
4. I control and am fully responsible for the results of my investment decisions.

In regressions reported in Dorn and Sengmueller (2008), we find that none of the overconfidence proxies is significantly related to excess turnover. Moreover, the significance of our hobby and gambler proxies is maintained even while controlling for overconfidence.

We also investigated how our hobbyist and gambler designations interact with overconfidence. The results of interacting the investor's agreement with "I enjoy investing" with the three overconfidence proxies are shown in Figures 6-8. To simplify the presentation, and to ensure that the resulting groups consist of enough members, we created binary entertainment and overconfidence proxies. In general, no additional insights were found in this interaction, overconfident hobby or gambler investors turned over their portfolios at similar rates as underconfident investors with the same hobby or gambling affinities.<sup>7</sup>

### III. Conclusion

Some investors derive enjoyment from trading which offset

<sup>7</sup>In Figure 6, it appears that the underconfident who do not enjoy investing trade less than their overconfident peers. However, the difference in trading activity is not statistically significant.

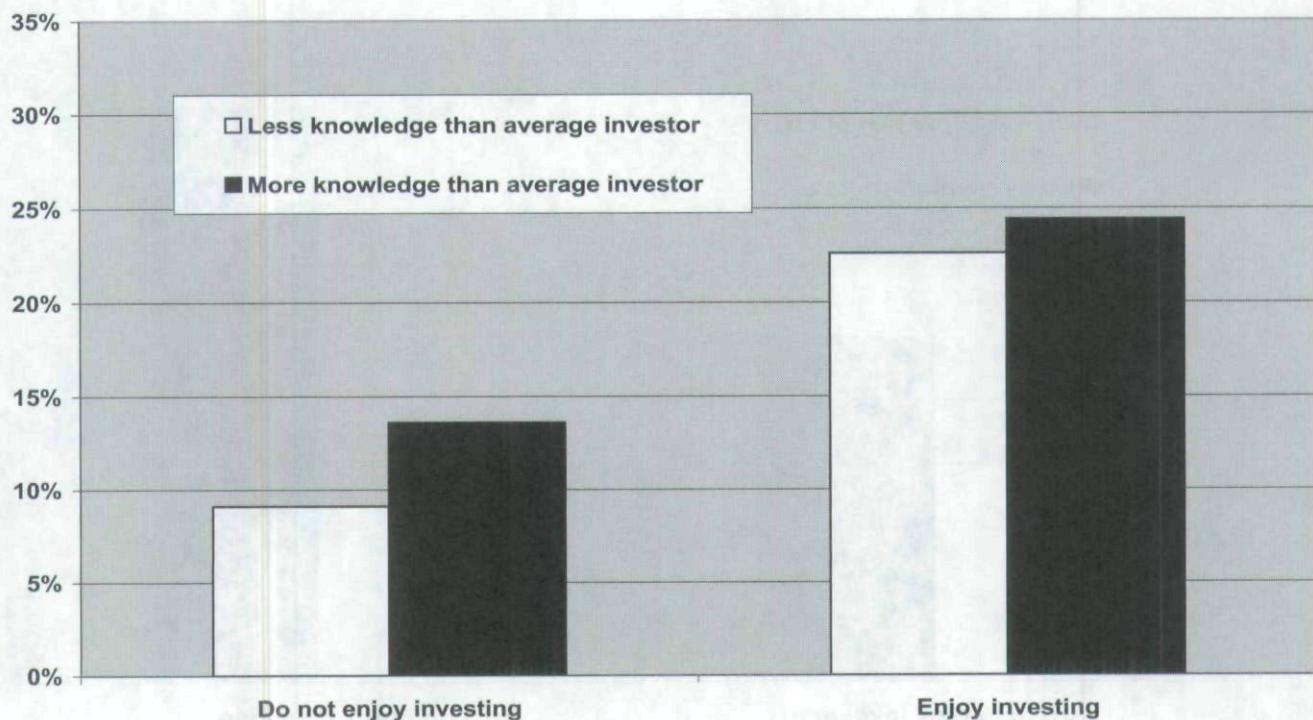
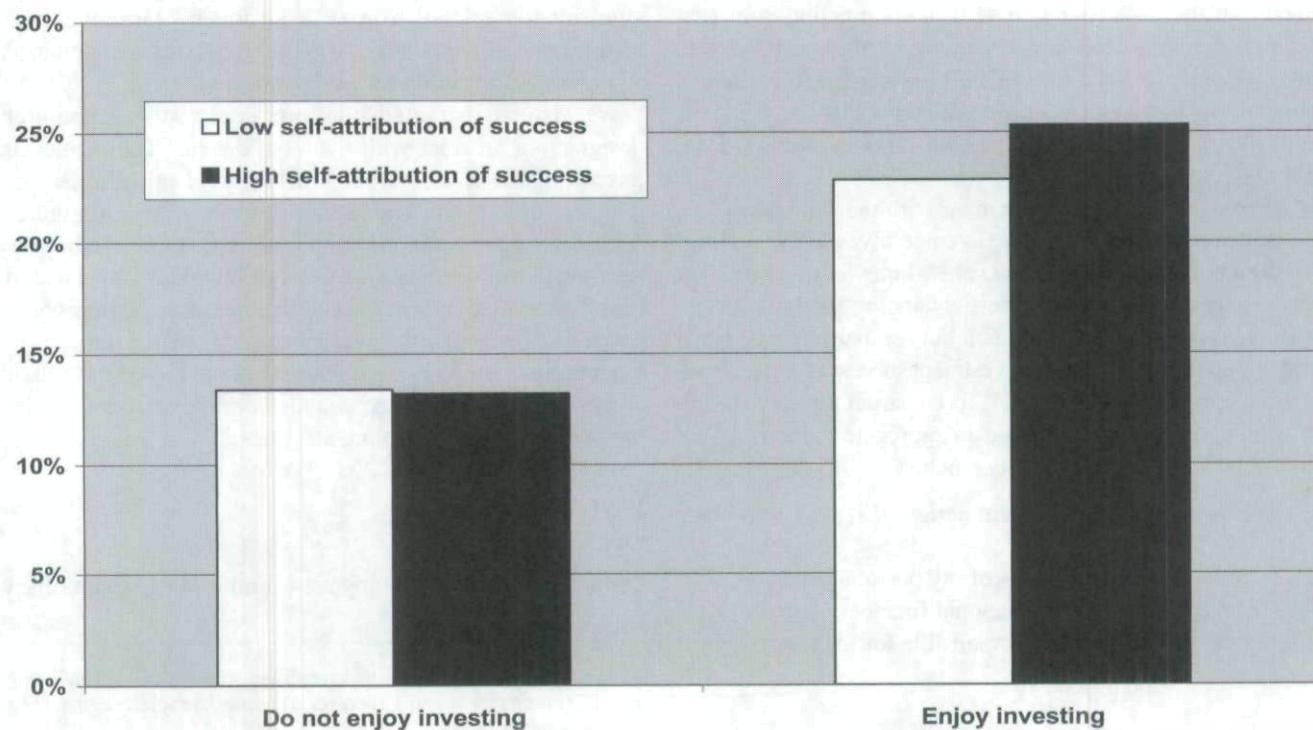
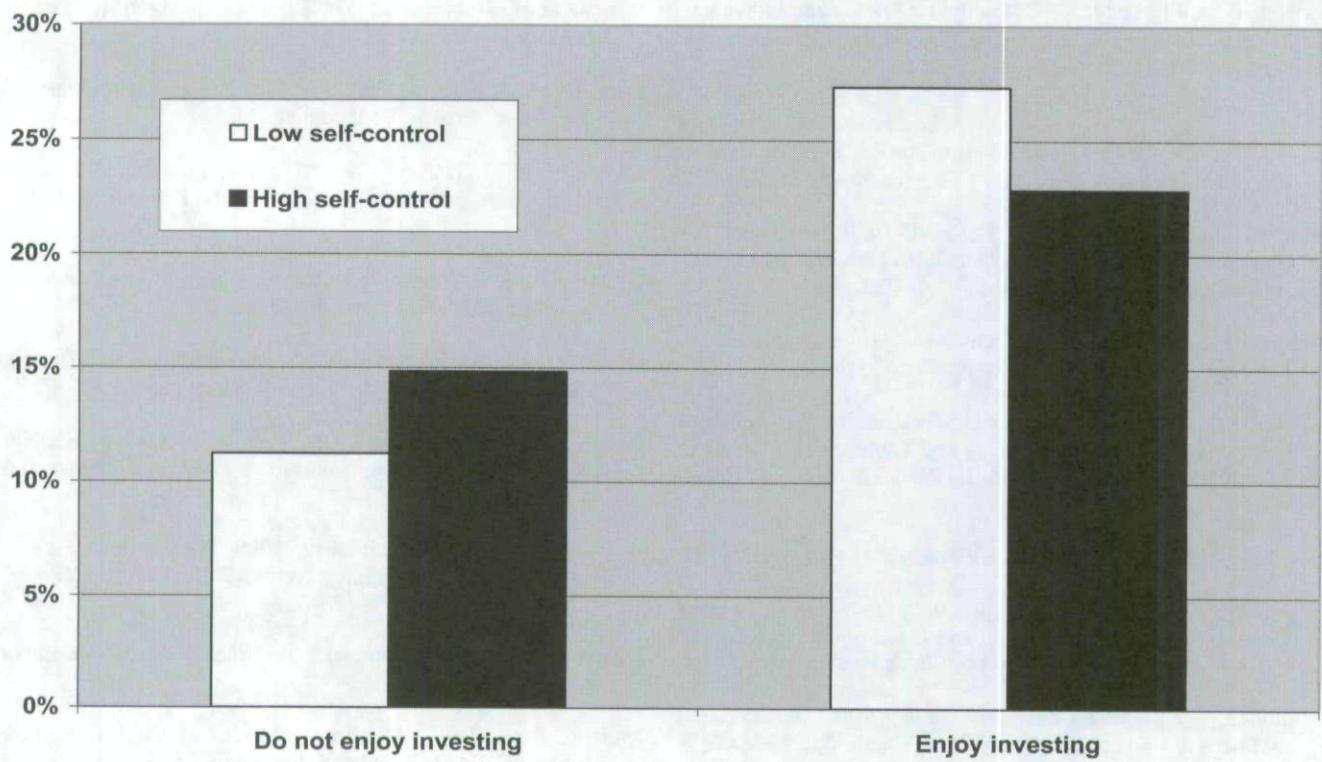
**Figure 6: Excess Turnover of Investors Sorted by Enjoyment of Investing and Relative Knowledge****Figure 7: Excess Turnover of Investors Sorted by Enjoyment of Investing and Self-Attribution of Success**

Figure 8: Excess Turnover of Investors Sorted by Enjoyment of Investing and Self-Control



the costs of churning. Like lottery players who buy tickets with negative expected values, entertainment-driven investors trade even though trading diminishes the expected monetary payoff of their portfolio. Consistent with this conjecture, variation in the self-reported enjoyment of investing and gambling explains variation in trading intensity even after controlling for competing explanations such as overconfidence.

The most entertainment-driven investors trade about twice as much as those who fail to take pleasure in gambling or investing. Relying solely on transaction records (that is,

independently of the survey responses), we estimate that more than half of the observed portfolio turnover is excess turnover — turnover in excess of what can be justified by standard trading motives such as savings/dissavings, liquidity, and rebalancing. Most of the variation in trading activity across individuals is variation in excess turnover. Variation in excess turnover is highly correlated with our proxies for non-pecuniary benefits derived from trading. In sum, entertainment trading appears to be quantitatively important — at least for this sample of discount brokerage customers during the late 1990s. ■

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