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Who Is Successful in Foreign Exchange Margin Trading?
New Survey Evidence from Japan

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Who Is Successful in Foreign Exchange Margin Trading?

New Survey Evidence from Japan

Abstract

We use a 2018 survey of FX margin traders in Japan to investigate which key factors influence their performance: socio-demographic and economic situation, investment strategy and trading behaviour, and/or financial literacy. First, the data show that variables from all three groups are significant predictors of traders' performance. Second, we find that older traders and those without a specific trading strategy demonstrate lower performance. Performance is higher for those who trade greater amounts, rely more on fundamental analysis, and report having profitable FX trade skills. Third, respondents' subjectively stated claim of having FX trade skills is based on a more advanced understanding of FX trading and a reliance on professional advice. Neither objective financial knowledge nor over/underconfidence play a noteworthy role in the performance of margin traders.

JEL: F31, G11, G28, G40.

Keywords: Foreign exchange margin trading, investor survey, foreign exchange trading profits, financial literacy, Japan

1. Introduction

What factors determine the performance of 'Mrs Watanabe'? This probably sounds like a strange research question for a study on foreign exchange (FX) trading, which is typically associated with large financial investors. However, 'Mrs Watanabe' is a well-known synonym for an individual FX margin trader in Japan, and one highlighted again in the recent Japanese yen flash event. On 3 January 2019, the Japanese yen appreciated very sharply against the US dollar over a few minutes around the opening of the Asian trading session. This flash event quickly cascaded across a number of other markets, with the Australian dollar and Turkish lira depreciating sharply during a period of low liquidity. The Reserve Bank of Australia (2019) reports three key factors likely to have contributed to this flash event, one of which is the liquidation of 'carry trade' positions, particularly those of Japanese retail traders.[1] Publicly available data on retail positions suggest that Japanese traders held aggressive long positions in high-yield currencies (including the US dollar, Australian dollar, and Turkish lira) prior to the event. Retail brokers will automatically liquidate these positions (vie stop-loss orders) if losses due to adverse exchange rate movements exceed predetermined levels. This automatic liquidation process would have contributed to the outsized depreciation in some high-yield currencies relative to the yen. Thus, the behaviour of Japanese retail traders can trigger world FX market turbulence.

FX margin trading is an important influence on the total Japanese FX market. According to the Triennial Survey 2013, BIS (2013) reports that Japan has the biggest retail spot FX market in the world and accounts for 36 per cent of global retail spot FX trading, followed by the United States (16%) and Britain (15%). The estimated volume of retail margin trading has exceeded the interbank spot trading volume in Tokyo since 2013, with a ratio of 1.5 times in 2017 and that of 1.1 times in 2018 (Financial Futures Association of Japan 2018a, Tables 2 and 3). Thus, this part of the Japanese FX market is not just an interesting curiosity.

In this paper, we investigate the core characteristics that distinguish a successful margin trader from an unsuccessful one. There are two possible empirical approaches to such an investigation, each with their advantages and disadvantages. The first approach is to use transaction data, which are objective and measure what traders actually did, for instance, with regard to trading volume, investment horizon, and leverage. The second approach relies on survey data, which are subjective and represent what traders say they did. As such, survey data are prone to a much larger number of possible errors, ranging from memory shortcomings to giving socially desirable answers. The advantage of the second approach, however, consists of being able to study variables that are not observable from the transaction data, for example, objective/subjective knowledge, preferences, trading preparations, or adopted investment policy. Here, we follow the second approach.

There is considerable evidence on the stock trading behaviour of individual investors (see, e.g., Barber and Odean 2013). For example, retail investors perform worse than typical benchmarks, are subject to the disposition effect, i.e., holding losing securities and selling winning ones, are affected by limited attention and past return performance, repeat patterns that were successful in the past, and tend to diversify insufficiently. In contrast, there is only a small literature studying retail FX traders. Menkhoff and Schmeling (2010) demonstrate that information about a trade's counterparty affects individual traders' trading decisions in the future. Moreover, better informed traders tend to consider publicly available information in addition to their own private information, whereas uninformed traders typically simply copy the trading of informed traders. Using an online currency transactions dataset, Abbey and Doukas (2015) show that individual traders earn positive excess returns, even after

[1] The other two factors are very low market liquidity at the time of the day and year (close to New Year's Day and during the vacation period of many participants) and algorithmic trading strategies, which might amplify the flash event.

accounting for transaction costs. It also appears that there is a positive correlation between performance and trade activity. Hayley and Marsh (2016) analyse the benefit of experience. Using actual trading data, they discover that retail FX traders show no obvious tendency to learn to trade better over time, but they do appear to achieve a more accurate assessment of their own abilities.

Our analysis places special emphasis on analysing the effects of financial literacy on FX margin trader's trading performance. There is a large literature studying various aspects of financial literacy. Lusardi and Mitchell (2014) provide an extensive survey of the extant literature, from which it becomes apparent that those who do research on financial literacy usually focus on stocks and investment trusts. An important contribution of that literature is to show that financial knowledge can have significant effects on financial market performance. For instance, von Gaudecker (2015) provides evidence that individuals relying on professionals or private contacts for advice or who score high on financial literacy achieve systematically better investment returns. Krische (2018) reports that individuals more likely to study financial reporting information as a base for making their investment decisions tend to have relatively high levels of financial literacy. Wang (2009) argues that financial knowledge is a likely explanation for investors' financial behaviour. He shows that gender is a crucial factor differentiating investors' objective knowledge, subjective knowledge, and risk taking, which are found to be highly correlated. Xia et al. (2014) study the influence of overconfidence, based on the difference between subjective and objective knowledge, for stock market participation. They find that overconfidence (underconfidence) is positively (negatively) correlated with stock market participation. Stock market participation is also affected by household literacy: low literacy decreases the likelihood of participation (van Rooij et al. 2011). Consistency between self-assessment and actual portfolio composition is investigated by Nicoletta et al. (2017). Their results suggest that investors' low literacy, among other factors, makes inconsistencies more likely. Bellofatto et al. (2018) present evidence that subjective financial literacy helps explain cross-sectional differences in retail investors' actions. Investors reporting higher levels of financial literacy appear to invest more intelligently, even after controlling for gender, age, portfolio value, trading experience, and education. Hsiao and Tsai (2018) study the question of whether individuals with higher levels of financial literacy are more likely to be active participants in derivatives markets. Employing survey data on derivatives trading in Taiwan, they provide evidence supporting the linkage between literacy and participation.

The literature on financial knowledge covers many aspects, but no one has considered higher-risk assets such as FX investments, which are the focus of our paper. Using survey data on FX margin traders collected in 2018 on behalf of the Financial Futures Association of Japan, we study factors that are associated with three alternative investment performance indicators. For our cross-sectional regression analysis, explanatory variables are divided into three categories: (i) socio-demographic and economic situation, (ii) investment strategy and trading behaviour, and (iii) financial literacy. Thus, in our analysis, we emphasise those factors that cannot be controlled for when employing actual trading data. We are especially interested in discovering whether there is a relationship between specific aspects of individual financial literacy and FX trading success.

We draw the following conclusions. First, variables from all three groups are significant predictors of traders' performance. Second, we find that older traders and those without a specific trading strategy exhibit lower performance. Performance is higher for those who trade greater amounts, rely more on fundamental factors, and report high FX trade skills. Third, respondents' subjectively stated claim of having FX trade skills is based on a more advanced understanding of FX trading and a reliance on professional advice. Neither objective financial knowledge nor over/underconfidence appear to play a noteworthy role in the performance of FX margin traders.

In the next section, we present the dataset and our empirical methodology in more detail. Section 3 contains the estimation results, which are interpreted in Section 4. In Section 5, we provide further analysis of the role of FX trade skills. Section 6 concludes.

2. Data and Methodology

We utilise survey data collected via the Internet on behalf of the Financial Futures Association of Japan in the period 23 February to 1 March 2018 (see Financial Futures Association of Japan 2018b). Based on a web panel maintained by Nippon Research Center Ltd., a sample of 1,000 members of the general population between the ages of 20 and 80 has been drawn from across Japan, with a preference given to those conducting foreign exchange margin transactions at the time of the survey. In 2017, the Financial Futures Attitude Survey of Individual Investors was conducted to survey 2,000 individual members of the general public from across Japan, these being chosen according to the results of the 2015 national census (Financial Futures Association of Japan 2017). Using the appearance rate of those having experience with foreign exchange margin transactions obtained from the 2017 survey, the size of the relevant age and gender groups of FX margin traders was determined, which was subsequently employed to collect the current sample. Put differently, with regard to the age and gender composition of respondents, the current sample is in line with the estimate for the population of Japanese individual FX traders at large. A summary of descriptive results for the survey can be found in Financial Futures Association of Japan (2018b).

To estimate the influence of correlates on trading success, we employ three alternative dependent variables. First, we use respondents' answers to a question asking whether they made a profit or loss in yen through FX trading in the previous year, i.e., 2017. This question contains eight answer categories. See the Appendix for more details about the variables employed in our study. We take the mid-point of these answer categories and construct our first dependent variable as profits/losses (in yen, mean: 123,150 yen, median: 100,000 yen). A problem with that variable is that we know nothing about the capital invested in trading. Thus, our second dependent variable standardises profits/losses in yen by the average trading amount of FX transactions (in per cent, mean: 21%, median: 18%). This can be thought of as a proxy for a return on investment. A third operationalisation of a performance variable is traders' profits/losses in yen divided by their income in yen (in per cent, mean: 0.52%, median: 0.41%). In principle, the available FX investment capital is the margin deposited in the FX broker's account that the investor is using. However, it can be the case that the investor transfers liquidity from another account to the FX margin. Hence, potentially, the margin includes part of the investor's cash deposit. To reflect that, we assume that a trader's liquidity is related to his/her income level. Thus, our third dependent variable reflects an alternative version of a return that is based on dividing profits in yen by income in yen (in per cent). Our dependent variables are skewed to the right, which is typical for financial market returns.

We group our explanatory variables into three broad categories (for a detailed description of variables, see the Appendix): (i) socio-demographic and economic situation, (ii) investment strategy and trading behaviour, and (iii) financial literacy. With regard to (i), we describe the respondent's socio-demographic and economic position by the variables Age (in years), Female (dummy), Education (ranging from primary to graduate school), Occupation (nine dummies), and Income (in million yen per year; included when not used for constructing the dependent variable).

Variable group (ii), investment strategy and trading behaviour, is captured by Trade Horizon (average period of holding new positions), Recent FX Trade (most recent FX margin trading), Leverage (leverage ratios for FX transactions), Fundamental (preference for fundamental analysis vs technical analysis),

Order Stop-Loss (uses stop-loss order), Investment Policy (seven dummies for using a specific investment strategy), FX Transactions (number of FX transactions during a year), and Trade Amount (average trading amount for new FX transactions; included when not used for constructing the dependent variable).

We divide the last group, (iii), relating to financial literacy into four subgroups: Subjective Knowledge, Objective Knowledge, Experience, and Information Channels. Subjective Knowledge is the outcome of a factor analysis based on three indicators, Knowledge Terms Index (sum of 16 dummies measuring whether respondents claim to understand FX terms), Subjective Financial Knowledge (self-evaluation of own level of overall financial knowledge), and Knowledge Index (sum of eight dummies measuring subjective knowledge about FX trading). For details on the factor analysis, see Table A1 in the Appendix. Based on the usual criterion of an eigenvalue larger than unity, only one factor can be found. This factor is associated with factor loadings ranging from over 0.4 to over 0.7, a clear rejection of the no-factor model, and an acceptable Kaiser-Meyer-Olkin value of 0.6. The factor is employed to preserve degrees of freedom. Note, however, that all results hold when individually including the variables underlying the factor.

Objective Knowledge originates from the simple sum of correct answers to two questions: Objective Knowledge Interest Rate (dummy measuring a correct interest rate calculation) and Objective Knowledge Leverage (dummy measuring the correct answer to a question about the leverage ratio in FX trading). Employing the derived indicators for subjective and objective knowledge, we construct the variable Under/Overconfidence (proxying for the relative under- or overconfidence of respondents), which is based on recoding Subjective Knowledge into three percentiles (1 '< 33%', 2 '33%–67%',3 '> 67') and then subtracting Objective Knowledge.

Specific FX skills are assessed by two variables, FX Experience (years of experience in FX margin trading) and FX Trade Skills (dummy measuring whether respondent claims to have FX skills that on average generate returns). Willingness to learn about FX trade is captured by Learning Index (sum of eight dummies indicating which FX-related topics the respondent wants to learn about). Finally, information aspects are addressed by including the Major FX Info Index (sum of eight dummies measuring the number of sources for FX trading information) and FX Adverts (respondent knows about advertisements indicating spreads for FX trading).

We employ ordinary least square models to estimate the impact of our various indicators on the performance of FX margin traders. We use up to 33 explanatory variables, the influence of which we estimate jointly in a general model. Considering all possibly relevant variables takes into account both omitted variable bias and standard-error-decreasing complementarity (Hayo 2018). We then derive a parsimonious model using a general-to-specific modelling approach (see Hendry 1993). Specifically, we use the Autometrics reduction algorithm implemented in Oxmetrics (Doornik 2009). This algorithm employs a tree search to discover and eliminate insignificant variables, thereby improving on the multi-path search in Hendry and Krolzig (2005). Autometrics ensures that the final reduced model is a congruent representation of the general model. For all tests conducted here, we apply a nominal level of significance of 5 per cent.

Testing for heteroscedasticity using the White (1980) test indicates problems in the case of Profits/Losses in Yen as a dependent variable. We thus employ the heteroscedasticity-robust standard error estimator developed by MacKinnon and White (1985), which is based on jack-knifing and has better small-sample properties than the robust standard errors estimator originally put forward by White (1980).

We assess the robustness of the reduced model using impulse-indicator saturation (see Johansen and Nielsen 2009; Castle et al. 2012), which systematically assesses the possibility of multiple breaks in the data. This powerful process is based on the principle of adding an impulse indicator for every observation to the regressors of interest, which results in the total number of estimated parameters exceeding the sample size. This approach is based on entering the impulse indicators in blocks and then retaining the significant ones. The approach does not suffer from collinearity, as impulse indicators are mutually orthogonal. Note that the systematic study of possible combinations of impulse indicators in samples like the present one is computationally time intensive, even with fast computers. The final result of impulse-indicator saturation allows us to study the variables of interest after accounting for all outliers in the dataset.

3. Estimation Results

The left-hand side of Table A3 in the Appendix sets out estimates from the general models for the three dependent variables proxying traders' performance. While each of the models is jointly significant, most variables are not individually significant. Use of the Autometrics algorithm results in the reduced models shown in Table 1. Diagnostic information (Row (5)) shows that we cannot reject the implied testing-down restriction (i.e., that the coefficients are jointly equal to zero). Since the eliminated variables have no significant explanatory power as a group, we find no evidence that their individual insignificance is caused by collinearity. Therefore, we concentrate on the reduced models.

Starting with Profits/Losses in Yen as a dependent variable, we obtain a significantly estimated model (see Table A3). Since residuals appear to be subject to heteroscedasticity, we apply jack-knife robust standard errors. Using Autometrics, we derive the reduced model shown in the first column of Table 1. All the remaining variables are jointly as well as individually significant. Income, Leverage, and FX Experience turned out not to be robust under impulse-indicator saturation. To facilitate the interpretation of the coefficient, we study the impact of a one standard deviation change in the explanatory variables. Doing this for the dummy variables, however, does not make much sense, where we focus on the change of the dummy from zero to one. We find that several variables have a negative effect on making profits from FX margin trading. On average, a one standard deviation change in age decreases profits by 47,014 yen. A one standard deviation change in Trade Horizon towards a long-term perspective leads to a decrease in profits of 65,545 yen. Traders increasing their leverage by one standard deviation can be expected to realise a loss of 43,323 yen. A number of variables have a positive effect on profits. All evaluated at a one standard deviation change, we find that higher income raises profits by 41,340 yen, a higher trade amount increases profits by 109,163 yen, a change towards more fundamental analysis generates a profit of about 16,284 yen, more FX experience yields an additional 35,480 yen, and those who report having FX skills are better off by 122,753 yen, which is by far the greatest effect, followed by Trade Amount and Trade Horizon.

Table 1 also shows the reduced model when using Return on Investment (Profit/Trade Amount * 100) as a dependent variable. The number of significant variables is notably smaller in this case, as is the fit of the model to the data (see Row (3) at the bottom of the table). The No Specific Strategy variable is not robust to impulse-indicator saturation. Age again has a negative impact on performance. A one standard deviation increase in Age reduced Return on Investment by 31 percentage points (pp), a very noteworthy effect. Also in line with our previous findings, Fundamental and FX Trade Skills have a positive impact of 12 pp and 63 pp, respectively, after a one standard deviation hike. On average, adopting no specific strategy results in much lower performance, namely, a decline of 233 pp compared to those who have chosen a specific trading strategy.

Table 1: Reduced model: explaining performance of FX margin traders (OLS)

	Profits/losses in yen		Profits/losses relative to trading amount in %		Profits/losses relative to income in %	
Variables	Coefficient	Standard error	Coefficient	Standard error	Coefficient	Standard error
(i) socio-demographic and economic situation						
Age	-3673**#	(1242)	-2.44**#	(0.81)		
Income	0.0013**	(0.0005)			n.a.	
(ii) investment strategy and trading behaviour						
Trade Horizon	-31212**#	(8373)				
Leverage	-27077**	(9731)				
Fundamental	45233**#	(14150)	32.60**#	(11.60)	1.47*#	(0.70)
Investment Strategy						
Hold positions for long periods			Reference			
No specific strategy			-233.38**	(52.52)	-11.94**#	(2.61)
Trade Amount	68227**#	(10800)	n.a.		1.26**#	(0.48)
(iii) financial literacy						
FX Experience	22175*	(10910)				
FX Trade Skills	245505**#	(33970)	126.01**#	(30.27)	4.93**#	(1.56)
Constant					-7.90**#	(2.48)
(1) No. of observations	962		962		962	
(2) Test of joint significance	F(8,954)=22.9**		F(4,958)=13.1**		F(4,957)=13.1**	
(3) R-squared	0.15		0.05		0.05	
(4) Test for heteroscedasticity	F(15,946)=5.47**		F(6,955)=1.65		F(6,955)=2.03	
(5) Testing-down restriction	F(26,928)=0.70		F(28,929)=0.58		F(28,929)=1.20	

Notes: Estimation method: OLS. For Profits/losses in yen, jack-knife robust standard errors are used. In the models without a constant, the R-squared is based on the multivariate correlation coefficient. * and ** indicate significance at a 5 per cent and 1 per cent level, respectively. # indicates robustness after impulse-indicator saturation.

The right-hand side of Table 1 shows the reduced model when using Return (Profit/Income * 100) as the dependent variable. With a similar coefficient of determination as in the case of Return on Investment, we find three variables that have a positive effect on performance, all of which are robust under impulse-indicator saturation. On average, a one standard deviation change in Trade Amount increases Return by 2 pp. The corresponding effects for Fundamental and FX Trade Skills are 1 pp and 2 pp, respectively. Performance is negatively impacted by not having a clearly specified trading strategy; respondents without such a strategy suffered a 12 pp lower return, a very notable effect.

4. Interpretation of Estimation Results

Based on the estimation results, we show that five variables are especially robust among variables from the three categories: (i) socio-demographic and economic situation, (ii) investment strategy and trading behaviour, and (iii) financial literacy. We define 'robust' as significantly predicting at least two of the alternative performance indicators and surviving the impulse-indicator saturation. These variables are Age, No Specific Strategy, Trade Amount, Fundamental, and FX Trade Skills. Especially strong economic effects were estimated for No Specific Strategy and FX Trade Skills.

The result that older participants perform relatively worse is not due to estimating a linear model, as including a squared age term does not suggest a nonlinear relationship either. This result holds unconditionally in the case of profits/losses in yen, but only conditionally in the case of profits/losses relative to trading amount in per cent. Moreover, there is no notable impact on FX trading performance of an interaction between age and gender. It is noteworthy that socio-demographic variables other than age and a positive influence of income on profits play no role in trading performance. In particular, we find no difference between men and women, between respondents with different educational achievements, or between those working in various occupations.

Which trading strategy is most successful is a longstanding question in the field of finance (Siegel, 1998; Froot and Thaler 1990). We use subjective data here, so we measure what respondents think they do. Thus, it could very well be that respondents do not use the same mental models about trading strategies when answering the questions. In this respect, relying on actual trading data is beneficial, as it allows classifying traders' strategy based on common definitions (Barber and Odean 2013; Abbey and Doukas 2015; Hayley and Marsh 2016). However, subjective data have an advantage, too, as they provide information about what respondents think they are doing. Our result is interesting in that it suggests that it does not much matter what type of trading strategy a person adopts; what matters more is that he or she thought about adopting any specific strategy in the first place. Put differently, it is those traders who have failed to sufficiently structure and focus their trading activity who do relatively worse.

In light of our estimation results, some comments seem in order. The influence of Trade Amount on performance can be interpreted along two lines. First, seen from a technical perspective, as long as ex post returns are positive, investing more funds will generate higher profits. As shown in Table A1 in the Appendix, average profits are indeed positive in our sample, so our results can be understood in that way. However, the second way the influence of Trade Amount can be looked at is to view it as a proxy for trading experience, which would suggest that greater experience has an influence on a trader's performance. Inasmuch as the respondent's income controls for his or her available trading funds, adopting this view is supported by the finding that Trade Amount is significant when using profits/losses relative to income as a dependent variable.

Regarding respondents' preference for fundamental analysis versus technical analysis in FX trading, those who prefer the former show better performance. Again, different interpretations of this result

are possible. One could view it as an indication of people's trading approach, where consideration of fundamental factors is beneficial for performance. Alternatively, it can be viewed as a proxy for the degree of information acquisition, that is, an indication of how much effort traders put into understanding the economic environment within which their trades take place.

One of the strongest predictors of FX trading performance in our sample is FX Trade Skills, that is, a trader's subjective assessment of his or her own skills. To some extent, this finding using survey data is consistent with the result of Hayley and Marsh (2016) based on actual trading data, where retail traders learn about their innate abilities as FX traders. The finding is not only highly significant and very robust, but associated with large economic effects, too. We would interpret it as a subjective form of specific financial literacy. Thus, this specific dimension of financial literacy appears to be very important. Regarding financial literacy more generally, we find few variables to be significant, suggesting that in its general form, financial literacy does not seem to contribute much to improving profits.

5. Investigating the Role of FX Trade Skills

Given the strength and robustness of the FX Trade Skills variable, it is worth discovering how traders acquired these profitable trade skills, even though it the variable is only a subjective indicator. Hence, we further analyse which other financial literacy indicators and socio-demographic variables correlate with FX trade skills. In particular, we look at the answers to the following items: 'Knowledge acquired so far in connection with FX trading', 'Do you understand the following terms in the FX glossary?', 'Major sources of FX trading information', Objective Knowledge Index, Trade Amount, FX Adverts, FX Experience, Education, Age, Female, and Income. The general model is estimated with 41 variables, which is then reduced using the Autometrics algorithm. The results of the reduced model explaining FX Trade Skills are given in Table 2.[2]

Our analysis shows that FX Trade Skills is not associated with socio-economic indicators such as age, sex, education, or income. Neither does it depend on objective knowledge, FX experience, or trading amount. Instead, other indicators of financial literacy, particularly knowledge acquired so far in connection with FX trading in the form of mental training, appear to be relevant. This suggests that those who report having high FX trade skills have already acquired comprehensive FX knowledge. Specifically, the data shows that 97 per cent of those who report having knowledge of mental training have knowledge of trading mechanisms and risk management. Similarly, 83 per cent of those have knowledge of taxation, 78 per cent of those have knowledge of fundamental analysis techniques, and 84 per cent of those have knowledge of technical analysis techniques. These high shares suggest that extensive knowledge of FX trading, even to the extent of mental training, is required to be confident about having high trade skills. Arguably, such skills enable traders to be profitable.

Profitable traders are also characterised by understanding the more advanced technical terms 'OCO' (one-cancels-other order) and 'cover transaction'. Respondents who report having FX trade skills obtain their FX trading information chiefly from advice obtained at service counters of financial institutions, from brochures available at branches of financial institutions, and by relying on the advice of experts or professional advisors. This is consistent with von Gaudecker (2015), who shows that individuals relying on professionals or private contacts for advice achieve systematically better investment returns. Finally, successful traders are aware of FX adverts and are motivated to invest.

[2] To economise on space, we omitted the estimation details for the general model. They are available from the authors on request.

However, reflecting the outcome of the impulse-indicator saturation robustness test, we conclude that under no configuration does FX Trade Skills become insignificant when including these financial literacy indicators in the reduced model.

Table 2: Reduced model: explaining FX Trade Skills (OLS)

Variables	Coefficient	Standard error
Knowledge Index:		
Unconnected with specific knowledge	Reference	
Mental training	0.14**	(0.04)
Knowledge Terms Index:		
Cannot understand any of the foregoing terms	Reference	
OCO, if done	0.10**	(0.03)
Cover transaction	0.15**	(0.04)
Major FX Info Index:		
Other sources	Reference	
Advice obtained at service counters of financial institutions	0.18**	(0.06)
Brochures available at branches of financial institutions	0.23**	(0.07)
Advice from experts or professional advisors	0.23**	(0.06)
FX Adverts	0.07**	(0.01)
(1) No. of observations	999	
(2) Test of joint significance	F(7,992)=136.4**	
(3) R-squared	0.16	
(4) Test for heteroscedasticity	F(8,990)=2.53*	
(5) Testing-down restriction	F(34,957)=0.76	

Notes: Estimation method: OLS. Jack-knife robust standard errors are used. The R-squared is based on the multivariate correlation coefficient. * and ** indicate significance at a 5 per cent and 1 percent level, respectively.

In contrast to FX Trade Skills, Objective Knowledge about FX trading is not a significant predictor of margin traders' performance. There are two possible interpretations of this conclusion. First, assuming that our Objective Knowledge indicator works well, our results suggest that performance does not depend on a trader's level of factual knowledge. Second, it could also be that the survey questions do not measure the theoretical concept well enough. It thus would be interesting to conduct a similar survey in which objective knowledge is based on a larger number of items.

We constructed an indicator for the relative under/overconfidence of traders and discovered that there are possible combinations of explanatory variables for which this indicator becomes significant at a 10 per cent level. This implies that those who are overconfident experience relatively worse trading outcomes. However, this variable is not robust under our definition of the term and thus this

finding should not be overemphasised. As noted above, the objective knowledge indicator is based on only a few questions; considering more knowledge dimensions would likely yield a better indicator of under/overconfidence. Other psychological factors, such as risk aversion or time preference, may also play a role in trading outcomes, but, given the variables included in the dataset, there is no way to control for these.

Finally, it should be noted that endogeneity is a potential problem with our findings. Those who were able to make profits in the previous year are, based on their good performance, likely to report having trade skills. We re-estimate the models presented in Table 1 using as instrumental variables the ones from Table 2 (except Mental Training). As can be seen from the F-statistics in Table 2, these instruments easily pass Staiger and Stock's (1997) rule-of-thumb threshold of 10 for strong instruments. The results of the instrumental variable estimations concentrating on the effect of FX Trade Skills are given in Table 3.

Table 3: Reduced model: explaining performance of FX margin traders (IV)

	Profits/losses in yen		Profits/losses relative to trading amount in %		Profits/losses relative to income in %	
Variables	Coefficient	Standard error	Coefficient	Standard error	Coefficient	Standard error
Includes all variables from Table 1						
FX Trade Skills	438298**	(89150)	142~	(86)	7.3~	(4.4)
(1) No. of observations	962		962		962	
(2) Test of joint significance	$Chi^2(7)=135$**		$Chi^2(4)=37$**		$Chi^2(4)=45$**	
(3) Sargan test	$Chi^2(5)=6.1$		$Chi^2(5)=1.7$		$Chi^2(5)=7.3$	

Notes: Estimation method: two-stage least squares. ~, *, and ** indicate significance at a 10 per cent, 5 per cent, and 1 per cent level, respectively. # indicates robustness after impulse-indicator saturation.

Row (3) of Table 3 shows that the Sargan orthogonality test cannot be rejected. We find in the case of Profits/Losses in Yen that the coefficient is highly significant and much larger than the one estimated with OLS. In the case of Profits/losses relative to trading amount, the magnitude of the estimated values has risen too, although they are significant only at a 10 per cent level. Thus, even if we try to control for possible endogeneity between FX trade skills and FX trade performance using instrumental variable estimation, the results shown in Table 1 appear to be robust.

6. Conclusion

Using novel survey data collected in 2018 on behalf of the Financial Futures Association of Japan, we investigate the main characteristics that differentiate between successful and unsuccessful FX margin traders. Using cross-sectional regressions, we operationalise trading performance by three indicators: (i) profits in yen, (ii) profits in yen divided by trading amount, and (iii) profits in yen divided by income. We use three groups of indicators as regressors: (i) socio-demographic and economic situation, (ii) investment strategy and trading behaviour, and (iii) financial literacy. Using automatic model selection, we derive reduced models and test their robustness by employing impulse-indicator saturation. Although other variables may be significant in different model specifications, we opted for focussing only on variables that are robust.

We draw the following conclusions. First, variables from all three groups are significant predictors of traders' performance. Second, we find that older traders and those without a specific trading strategy exhibit lower performance. Performance is higher for those who trade greater amounts, rely more on fundamental factors, and report having high FX trade skills. Third, respondents' subjectively stated claim of having FX trade skills is based on a more advanced understanding of FX trading and a reliance on professional advice. Neither objective financial knowledge nor over/underconfidence appear to play a noteworthy role in the performance of FX margin traders.

Based on our results, we derive some recommendations for supervisory authorities, advising institutions, and FX margin investors. First, and possibly most important for successful trading, is the necessity of having a specific trading strategy. Which strategy is actually chosen is of lesser importance, as long as trading is guided by a structured approach. Put differently, random trading is not likely to yield positive outcomes. Moreover, we find that respondents who consider fundamental analysis to be more important than technical analysis achieve better performance. Second, having sufficient FX trading skills is key to successful trading. One way of interpreting our findings is that, among other things, these skills reflect a more advanced understanding of technical terms and an extensive knowledge of trade techniques. Third, obtaining, and listening to, advice from professional institutions and FX experts can have a strong influence on successful trading. In our estimations, these aspects were found to have the greatest economic impact on trading performance.

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Appendix

See Financial Futures Association of Japan (2018b) for more information about the survey and the questionnaire.

Table A1: Variable definitions and descriptive statistics

Variable	Coding and Comments	Mean	Std. Dev.	Min	Max
Profit	= Profit in Yen	123150	551544	-1500000	1500000
RoI	= Profit in Yen/Trade Amount * 100	21.3	491	-3000	3000
Return	= Profit in Yen/Income * 100	0.52	25.3	-300	300
(i) Socio-demographic and economic situation					
Age	Based on 10-year intervals from 20s to 70s. Continuous variable based on coding midpoints, i.e., 25 for '20s', 35 for '30s', etc.	43.6	12.8	25	75
Female	Dummy	0.24	0.43	0	1
Education	Continuous variable coded as 1 'Elementary, Junior high school', 2 'High school', 3 'Special (vocational) school', 4 'Junior college, technical college', 5 'University', 6 'Graduate School'.	4.2	1.4	1	6
Occupation	9 dummies: 'Self-employed (agricultural/forestry/fishery)', 'Independent professional (physicians, lawyers, etc.)', 'Family employee (incl. domestic help)', 'Full-time employee (officers, managers)', 'Full-time employee (non-managerial)', 'Part-time employee', 'Homemaker', 'Unemployed, pension beneficiary', 'Student'.	n.a.	n.a.	0	1

Income	Annual income in yen. Continuous variable based on coding midpoints, i.e., 500,000 '< 1 million yen', 150,0000 '1 million yen to < 2 million', 2,500,000 '2 million yen to < 3 million', 3,500,000 '3 million yen to < 4 million', 4,500,000 '4 million yen to < 5 million', 6,000,000 '5 million yen to < 7 million', 85,000,000 '7 million yen to < 10 million', 12,500,000 '10 million yen to < 15 million', 17,500,000 '15 million yen to < 20 million', 25,000,000 '> 20 million yen'.	22000000	31800000	500000	85000000
(ii)'Investment strategy and trading behaviour					
Trade Horizon	Continuous variable coded as 1 '< 1 min', 2 '1 min to < 10 min', 3 '10 min to < 1 hour', 4 '1 hour < 1 day', 5 '1 day < 1 week', 6 '1 week < 1 month', 7 '1 month < 6 months', 8 '6 months < 1 year', 9 '1 year < 5 years', 10 '> 5 years'.	5.5	2.1	1	10
Recent FX Trade	Continuous variable coded as 1 'Currently trading', 2 'Traded within the past one month', 3 'Traded over a month ago, within the past 3 months', 4 'Traded over 3 months ago, within the past 6 months', 5 'Traded over 6 months ago, within the past 1 year', 6 'Traded over a year ago, within the past 3 years', 7 'Traded over 3 years ago, within the past 5 years', 8 'Traded over 5 years ago'.	1.2	0.86	1	8
Leverage	Continuous variable coded as 1 '< 1:1', 2 '1:1 to < 1:5', 3 '1:5 < 1:10', 4 '1:10 < 1:15', 5 '1:15 < 1:20', 6 '1:20–1:25'.	3.4	1.6	1	6
Fundamental Analysis	Continuous variable coded as 1 'Fundamental 0% vs. technical 100%', 2 'Fundamental 25% vs. technical 75%', 3 'Fundamental 50% vs. technical 50%', 4 'Fundamental 75% vs. technical 25%', 5 'Fundamental 100% vs. technical 0%'.	0.15	0.36	0	1
Order Stop-Loss	Continuous variable coded as 1 'Stop-loss: rarely use' 2 'Use occasionally' 3 'Use frequently' 4 'Use very frequently'.	2.3	1.2	1	4
Investment Strategy	6 dummies: 'Hold positions for long periods', 'Focus on short-term profits', 'Place emphasis on swap points', 'Place emphasis on hedging exchange risks', 'Other', 'No specific policy'.	n.a.	n.a.	0	1

FX Transactions	Continuous variable coded as 1 '< once a year', 2 '1 < 10', 3 '10 < 20', 4 '20 < 50', 5 '50 < 100', 6 '100 < 500', 7 '500 or more'.	4.1	1.9	1	7
Trade Amount	Continuous variable coded as 1 'Less than ¥100,000', 2 '¥100,000 to < ¥500,000', 3 '¥500,000 to < ¥1 million', 4 '¥1 million to < ¥3 million', 5 '¥3 million to < ¥5 million', 6 '¥5 million to < ¥10 million', 7 '¥10 million to < ¥30 million', 8 '¥30 million to < ¥50 million', 9 '¥50 million or more'.	2.3	1.6	1	9
(iii) Financial literacy					
Subjective Knowledge	Factor based on Knowledge Terms Index, Subjective Financial Knowledge, and Knowledge Index (see Table A2).	0	0.81	-1.9	1.5
Knowledge Terms Index	Sum of positive answers to whether respondents understand terms in the FX glossary: 'Bid/ask (offer)', 'Spread', 'Margin', 'Limit order', 'Stop-loss order', 'OCO, if done', 'Loss-cut', 'Swap point', 'Leverage effect', 'Cash settlement', 'Slippage', 'Interbank market', 'Cover transaction', 'Marry transaction', 'Mechanism that allows investors to start either buying or selling a foreign currency', 'Cannot understand any of the foregoing terms'. Multiple answers possible.	8.9	4.2	0	15
Subjective Financial Knowledge	Continuous variable coded as 1 'Poorly informed', 2 'Relatively less-informed', 3 'Informed at an average level or no idea', 4 'Relatively well-informed', 5 'Better-informed'.	3.3	0.98	1	5
Knowledge Index	Sum of positive answers about whether respondents acquired specific knowledge in connection with FX trading: 'Trading mechanism, risk management', 'Taxation', 'Fundamental analysis techniques', 'Technical analysis techniques', 'Mental training', 'Other', 'Unconnected with specific knowledge'. Multiple answers possible.	2.7	1.7	0	6
Objective Knowledge	Sum of correct answers to Objective Knowledge Interest Rate and Objective Knowledge Leverage.	1.3	0.66	0	2

Objective Knowledge Interest Rate	Dummy, 1 for correct answer.	0.85	0.36	0	1
Objective Knowledge Leverage	Dummy, 1 for correct answer.	0.48	0.50	0	1
Under/Overconfidence	Based on recoding Subjective Knowledge into three categories based on percentiles (1 '< 33%', 2 '33%–67%',3 > '67%') and subtracting Objective Knowledge.	-0.35	0.95	-2	2
FX Experience	Continuous variable coded as 1 '< 1 month', 2 '1–3 months', 3 '3–6 months', 4 '6 months–1 year', 5 '1–3 years', 6 '3–5 years', 7 '> 5 years'.	5.7	1.6	1	7
FX Trade Skills	Dummy, 1 for having skills to generate a return from FX trading on average.	0.4	0.5	0	1
Learning Index	Sum of positive answers to whether respondents wants to learn specific aspects of FX trading: 'Trading mechanism, risk management', 'Taxation', 'Fundamental analysis techniques', 'Technical analysis techniques', 'Mental training', 'Other'. Multiple answers possible.	2.0	1.6	0	6
Major FX Info Index	Sum of using major sources of information for FX trading: 'Advice obtained at service counters of financial institutions', 'Brochures available at financial institutions' branches', 'Lecture meetings, seminars', 'Advice from experts or professional advisors', 'Mass media (TV, newspapers, etc.)', 'Websites', 'Conversations with family and friends', 'Coursework or lectures at schools', 'Printed books about financial instruments or investments', 'Other sources'. Multiple answers possible.	1.5	1.0	0	3
FX Adverts	Continuous variable coded as 1 'Unaware', 2 'Aware but cannot understand', 3 'Aware but not motivated to invest', 4 'Aware and motivated to invest'.	2.9	1.1	1	4

Table A2: Principal component analysis for latent variable Subjective Knowledge

Eigenvalues		
Factor 1	Factor 2	Factor 3
1.20	-0.04	-0.23
Factor loadings Factor 1		
Knowledge Terms Index	Subjective Financial Knowledge	Knowledge Index
0.69	0.43	0.74
LR test: Chi2(3)=611**	Overall Kaiser-Meyer-Olkin=0.6	Observations: 1,000

Table A3: General model: explaining performance of FX margin traders (OLS)

	Profits/losses in yen		Profits/losses relative to trading amount in %		Profits/losses relative to income in %	
Variables	Coefficient	Standard error	Coefficient	Standard error	Coefficient	Standard error
(i) socio-demographic and economic situation						
Age	-3697*	(1498)	-2.18	(1.45)	-0.07	(0.07)
Female	55226	(54359)	67.67	(44.48)	2.42	(2.17)
Education	-12569	(12918)	-8.92	(11.95)	-0.89	(0.59)
Occupation						
Other			Reference			
Self-employed	107982	(300518)	101.44	(245.90)	32.42	(12.03)

Independent professional	70021	(303725)	155.59	(250.90)	38.19**	(12.27)
Family employee	-306420	(383515)	-65.43	(311.20)	24.41	(15.19)
Full-time employee (officers, managers)	9048	(301505)	101.61	(245.50)	32.19**	(11.99)
Full-time employee (non-managerial)	-1244	(296268)	86.06	(241.90)	33.57**	(11.83)
Part-time employee	5437	(296987)	64.55	(245.90)	31.64**	(12.04)
Homemaker	1005	(302331)	45.40	(248.60)	34.10**	(12.16)
Unemployed, pension beneficiary	20711	(298183)	111.30	(244.20)	32.84**	(11.95)
Student	77730	(307647)	209.56	(271.50)	34.54**	(13.29)
Income	0.0014**	(0.0005)	0.000001	(0.000001)		n.a.
(ii) investment strategy and trading behaviour						
Trade Horizon	-27339*	(11036)	-8.88	(9.60)	-0.02	(0.47)
Recent FX Trade	-17021	(16042)	-8.33	(18.91)	-0.23	(0.92)
Leverage	-23114*	(10602)	-15.87	(10.05)	-0.61	(0.49)
Fundamental	50575**	(16893)	43.31**	(14.99)	1.92**	(0.73)
Order Stop-Loss	-3723	(17577)	-3.21	(15.73)	-0.15	(0.77)
Investment strategy						
Hold positions for long periods				Reference		
Focus on short-term profits	-3814	(47172)	8.19	(41.94)	2.51	(2.05)
Emphasis on swap points	57310	(53601)	48.91	(54.08)	6.53	(2.64)
Hedging exchange risks	21820	(117147)	-121.95	(109.50)	2.09	(5.36)
Other	316670	(281805)	94.44	(243.70)	5.66	(11.92)
No specific policy	-78361	(76635)	-217.78**	(64.48)	-8.91**	(3.15)

FX Transactions	2430	(11419)	5.67	(10.14)	0.37	(0.50)
Trade Amount	68619**	(14244)		n.a.	1.49**	(0.52)
(iii) financial literacy						
Subjective Knowledge	18191	(65313)	31.15	(57.60)	2.09	(2.82)
Objective Knowledge	-21890	(62231)	-11.50	(58.50)	0.20	(2.86)
Under/Overconfidence	-19782	(56590)	-52.17	(52.67)	-1.56	(2.57)
FX Experience	22942	(12374)	3.25	(11.80)	0.12	(0.58)
FX Trade Skills	223153**	(38095)	136.20**	(34.44)	4.60**	(1.68)
Learning Index	-7405	(12480)	-1.00	(10.84)	-0.76	(0.53)
Major FX Info Index	20048	(21069)	-18.16	(18.68)	-1.33	(0.91)
FX Adverts	19190	(16943)	7.88	(15.80)	0.96	(0.77)
Constant	-54944	(346725)	-58.27	(288.40)	-38.38**	(14.10)
(1) No. of observations	962		962		962	
(2) Test of joint significance	F(33,928)=5.66**		F(32,929)=2.19		F(32,929)=2.69**	
(3) R-squared	0.17		0.07		0.09	
(4) Test for heteroscedasticity	F(50,911)=2.72**		F(48,913)=1.20		F(48,913)=1.09	

Notes: Estimation method: OLS. For Profits/Losses in Yen: Jack-knife robust standard errors are used. * and ** indicate significance at a 5 per cent and 1 per cent level, respectively.