# Forex Trading Game in an Online Classroom with Heterogeneous Student Background

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ABSTRACT

This article presents a teaching exercise using real-time trading platform in an online international finance course with both finance and non-finance majors. The authors discuss their approach to accommodate to the on-line environment with the emphasis on preparation and flexibility, and present a statistical comparison of performance between online and on-campus students, which does not indicate significant differences.

Keywords: real-time trading, foreign exchange, learners of mixed background, hands-on learning, online education
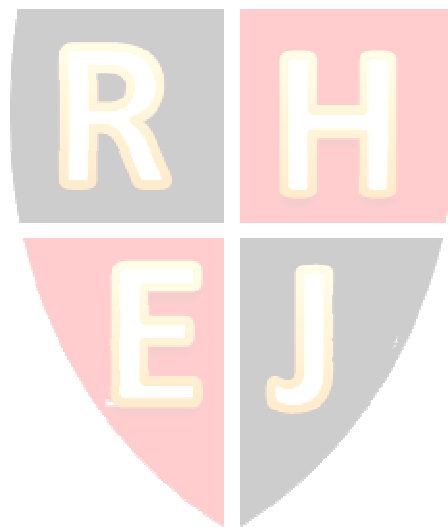
INTRODUCTION

Understanding foreign exchange rate behavior is critical for students in an international finance course. However, students, especially those without prior experience dealing with foreign currencies, often find forex market and quotations difficult to grasp. In addition, the forex market has many conventions and jargons, and textbook descriptions are often either too simplified to reflect the market complexity or too dry and tedious for students to read and fully understand. In this situation, hand-on exercises are necessary to help students demystify the forex market and gain practical understandings. Many prior papers (e.g., Seiver, 2013) discuss the use of real time trading in the international finance classroom and present evidence of its effectiveness.

This paper discusses one practical issue of this teaching approach in an online environment with mixed background and expectations of students: both finance majors and non-finance majors such as international business majors. Finance majors are usually more appreciative of the opportunity to trade in the forex market, and they might even have experience of real-time trading in the stock market before coming to the course. Therefore, they only need to familiarize themselves with the new terms of the forex market, and the different conventions and features of the forex trading platform. However, international business students in the class are often more reluctant to the idea of real-time trading. First, they might have difficulty linking forex trading to their career goals, creating a motivation barrier. Secondly, the steeper learning curve associated with real-time trading adds extra stress to these students. While commercial real-time trading platforms offer user-friendly features, there are still a lot of technical aspects that the students need to learn. In addition, there might be knowledge gap for these students. For example, they initially might have problem understanding bid-ask spread, leverage, and even unrealized gains/losses. Therefore, the technical aspects and knowledge gap can make real-time trading a daunting task for non-finance majors.

Complicating the mixed-background issue is the online teaching environment. In a physical classroom, the instructor is able to demonstrate the process, and answer student questions in a timely two-way manner. Online students are faced with additional hurdles to completely understand the goal and scope of the trading project. In this paper, the authors present their approach to accommodate the need of both groups of students in an online setting with the emphasis on preparation and flexibility. The authors discuss how they prepare students for the trading game with limited class time. Further, they talk about how they build flexibility in the implementation of the trading exercise to further ease unnecessary student anxiety and foster learning. Finally, they present a statistical comparison of student performance on the project between online and on-campus classes.

LITERATURE REVIEW

Prior papers have presented various exercises that enhance student learning of foreign exchange rate quotation and behavior. For example, Zapalska and Brozik (2007) present a foreign exchange rate simulation in the physical classroom to promote student learning. Their focus is for students to discover how exchange rates are set through the simulation game. Mitchell et al (2009) present a classroom experiment on exchange rate determination using purchasing power parity, in which an auction is set up for students who represent citizens of different countries to buy currencies to fulfill the students' needs for goods. Johnson (2010) uses

the open source Caltech/UCLA Multistage software platform and designs a general equilibrium experiment that allows students to simultaneously trade in two goods markets and a foreign exchange market. An advantage of this experiment is that it is a computerized experiment and therefore it is possible for multiple trades to happen in a short period of time. Chou and Liu (2013) discuss the use of self-designed web-based foreign exchange trading simulation and find it effective in improving student comprehension. Smith (2013) utilizes the MONOPOLY TM board game to promote the learning of foreign exchange risk and accounting for foreign currency transactions. Specifically on the use of Oanda practice accounts for real-time trading, Seiver (2013) provides thorough discussion on the best practices and present evidence on the effectiveness of this approach.

The engagement, as promoted by class projects such as trading games, is even more critical for an online classroom. With the advancement of technology, virtual learning has gained popularity over the past decade. According to the National Center for Educational Statistics, 5.75 million students are enrolled in distance education courses at degree-granting postsecondary institutions in fall 2014, representing approximately 28.5% of total enrollment. However, the effectiveness of online courses as compared with face-to-face courses is up to debate. On the one hand, some researchers suggest no significant difference. For example, utilizing an undergraduate course in management science, Dellana, Collins, and West (2000) find on-line courses as effective as on-campus ones. However, prior literature also suggests that on-line courses often suffer from poor student engagement, which leads to both poor student performance and poor student evaluation of instructors (e.g., Stott, 2016). For example, Xu and Jaggars (2014) report decrements in performance in online courses using a sample of over 500,000 courses at community and technical colleges in the state of Washington. They also identify business as one of the several subject areas that shows the strongest online performance gap after controlling for individual and peer effects. Focusing on a specific course, Brown and Liedholm (2002) also document performance gap between online and face-to-face principles of microeconomics courses. They find that online students, who have better characteristics such as significantly higher ACT scores, perform significantly worse than on-campus students on exams, especially on questions that require the application of basic concepts in sophisticated ways.

The potential concern regarding the effectiveness of online courses highlights the importance of best practices in online education and virtual learning. Prior literature has offered a wealth of evidence and recommendations regarding effective online instruction. For example, Henderson and Smith-Nash (2007) discuss the design of effective on-line courses. They emphasize the importance of student active participation in the learning process and suggest three aspects of "the most meaningful" online instructions: (1) engagement of both teachers and students in supportive activities, (2) on-demand skills acquisition, and (3) guidance and positive reinforcement from instructors. Jaggars and Xu (2016) present empirical evidence that the quality of interpersonal interaction is significantly and positively related to student grades. Their analysis further suggests that frequent and effective student-instructor interactions encourage students to be more committed to the course. Grandzol and Grandzol (2006) provide a thorough survey of literature pertaining to online business education. In terms of student engagement, Robinson and Hullinger (2008) suggest that online courses should incorporate the following factors to actively engage students: academic rigor, consistent and timely student-faculty interaction, collaborative leaning environment, and activities to enrich student leaning. A trading game represents an activity to enrich student learning. At the same time, a trading game provides opportunities for increased student-faculty interaction, and potentially a collaborative learning

environment if assigned as a group project. However, the online environment presents unique challenges for both instructors and students. While engagement is always preferred, it is not always perceived well with students who are less-motivated. Stott (2016) suggests that many students complain about the workload even when the instructor's intension is to promote engagement.

Complicating the problem is the heterogeneity of student background in a course. Prior research demonstrates that business students may select into different majors based several factors. For example, Worthington and Higgs (2003) document that the major choice of finance is a function of students' overall interest in the profession, perceptions of how the profession deals with problems and tasks, the nature of these problems and tasks, and mode of attendance. Noel, Michael, and Levas (2003) report that student personalities differ according to majors in a way that is largely consistent with general perception and stereotyping.

TRADING GAME IMPLEMENTATION

The authors start utilizing a real-time trading game in their international finance classes to enhance student practical understanding of the forex market in Fall 2008. Oanda is the trading platform they use, except for one year that students are allowed to use an alternative trading platform to participate in a college currency trading competition hosted by FXDM.

Over the years, the authors have altered the length of the trading period, but it is usually 6-10 weeks starting from the second week of a semester. This period is accompanied by course discussion of foreign exchange rate behavior and determination, exchange rate theory, and the forecasting of exchange rate. Since the forex market is bound with news and events that move the market, the trading game provides valuable teaching opportunities during the trading period, greatly enhancing student understanding and knowledge retention. For example, students witness firsthand how the Fed decision of not tapering moved the world currencies in the fall of 2013, reinforcing the concept of how interest rates affect capital flows and exchange rates. In addition, the trading game presents an "immersion" approach that forces students to track world happenings and learn the idiosyncrasies of particular currencies, some of which, although vital to a forex professional, might not even be covered in a classic textbook.

In the implementation of the game, the authors usually discuss the relevant terms and conventions of the forext market, and introduce the trading platform during the first week of class. Then students are asked to take a position in the forex market and to report their initial trading decision in a discussion board posting for five percent of the assignment grade. After that, students mainly utilize their out-of-class time to trade and follow their currencies, although the game does present opportunities for vivid classroom discussion.

At the end of the game, all students are required to document their trading experience and analyze their currencies in a trading report, and share the report in a discussion board to promote peer learning. For the trading reports, the students are required to present the following:

(1) Trading activities, account balance and profit. For this part, one short paragraph is expected. The authors also ask students to ignore the gains/losses from interest earnings from various currency positions.

(2) The events or factors that have influenced their currencies over the game period. For this part, students are expected to list and explain major events or factors that have affected their currencies. The authors advise students to take note during the trading period, and the quick note will then become the raw materials for students to synthesize at the end. This way, the final

write-up can be a much quicker process. Ideally, students will follow the advice. However, even for students who are not attentive to their account on a regular basis as expected, the write-up of this part can still be a worthwhile educational experience. They can still take a retrospective approach: check the chart during the trading period, find out when major movements occur, and then search on Google news for their currency on that specific day.

(3) Events or factors students will watch closely in the future that might have a big impact on their currencies, such as the next Fed meeting or the next major economic data release. The economic calendar for major economic releases for various countries such as the one from fxstreet.com can come in handy. Also, by tracking their currencies and researching and writing on the second part, students are expected to recognize common drivers of their currencies, and thus focus on these main drivers in this section.

(4) Students' prediction of future movement of currencies. This could be a natural extension of the previous part because students might have formed opinions regarding the major movement of the major drivers of the currency, leading to a subjective assessment of future exchange rate movement. Also, although not required, students are encouraged to utilize the common forecasting methods learned in the course. For example, a quick addition to this part is to check the forward rate or to apply Purchasing Power Parity (PPP). In the past, some students even voluntarily utilize more complex regression models to forecast exchange rates. Although the traditional exchange rate determination model based on macro variables is covered in most international finance textbooks, academic research has not provided robust empirical evidence for it (e.g., Lyons, 2002). However, it is still a fruitful endeavor for students to apply theory in real-life situations, and therefore recognize the complexity of real-world problems. Overall, the authors emphasize to students that nobody can accurately and consistently predict exchange rates (and hence the students need to learn how to hedge exchange rate risk in the second half of the course), but they need to make sure that their prediction is logical with supporting details.

The trading report accounts for the remaining 95% of the assignment scores, and is graded solely on the quality of the report. The authors do not consider trading performance as a basis of grading because the trading game starts early in the semester when students do not have course coverage on exchange rate determination. In this case, considering trading performance can actually add to student anxiety, which hinders learning. More importantly, based on the authors' experiences, better trading performance is often a function of luck and leverage rather than a reflection of effort and learning outcome.

PREPARATION AND FLEXIBILITY

With the growing popularity of online education, the authors have the opportunity of assigning the project to online-students as well. For online international finance classes with both finance majors and non-finance majors, the authors find that preparation and flexibility are the two vital factors in the success and effectiveness of the real-time trading game.

Preparation

As discussed above, during the preparation stage, usually the first week of the semester, the authors introduce the basics about foreign exchange market and foreign exchange rates. They use Oanda.com practice trading platform as the web resource to reinforce the basic vocabulary just introduced. After that, they announce the trading game to the class, laying out the rules of

the game, showing the class how to set up the practice account, and introducing the trading platform. For the online students, demonstration videos are available with step-by-step instructions.

In the introduction of the trading game, the authors also try to prepare students mentally for the game. First, students need to be convinced that the trading game will help them learn the course content better. Second, students need to know that their score is not derived from how much profit they can make from the forex market. Instead, they are graded based on the quality of the trading report. In addition, the class should have covered the related course materials (e.g., exchange rate determination, exchange rate theory, and methods of forecasting exchange rates) by the time they are to write the trading report. Finally, the authors assure students that they are on the students' side to help in case difficulties occur.

Students need to go to Oanda website on their own to set up the practice account. Even with class/video demonstration and the user-friendly trouble-shooting feature of the Oanda trading platform, students may still encounter problems, especially those who take the course online. To address this issue, the authors prepared a detailed list of FAQs for students to answer potential questions in a student-friendly way. There has been a dramatic drop in questions/problems from students after the introduction of FAQs. The authors have included a sample of the FAQs in the Appendix. Overall, several precautions are in order at this stage.

Technological difficulties: For example, the running of Oanda trading platform requires the latest java. Also, students sometimes are unable to access it before clearing cache for their computers. Another common and not so technological mistake that students often make when logging in is to forget clicking the "practice trading" tab, therefore attempting to log into a real trading account instead. The authors have summarized the common questions in the FAQs. With the growing popularity of mobile apps, instructors can also recommend the Oanda trading app for students, which bypasses many technological issues students sometimes encounter with the website version.

Confusion about forex conventions: The other category of confusions arises from forex conventions, especially for those currencies that use indirect quotations such as Japanese Yen. First, students need to realize that they are dealing with currency pairs in the forex market. When they buy one currency, they are simultaneously selling another currency. Secondly, they need to know that when they buy (sell) and specify the amount of currencies to buy (sell), they are always referring to the first currency in the currency pair. Finally, the students need to be aware of their use of leverage. Oanda allows leverage up to 50:1, and students may accidentally use more leverage than they intend to.

Flexibility

Considering the makeup of students in class with both finance majors and non-finance majors, the authors build flexibility in the trading game. First, students are allowed to either trade as actively as they wish, or adopt a "buy and hold" approach—take a position in a currency pair of their interest and hold till the end of the game while tracking the movement of their currency pairs during the game. Most students in the authors' classes take the "buy and hold" approach, including some who might trade two or three currency pairs at the beginning of the game. Only a few students choose to be the active traders in the game every semester.

While the instructors could make the trading game more competitive, many students lack any trading experience or prior knowledge in the forex market. There might be unnecessary

anxiety on the students' part. Especially if the trading game starts early in the semester, a few students may even deem it unfair since they do not receive sufficient instruction to pick the currency to trade on. The more laid-back approach can ease this concern, and help students be more focused on the learning experience instead. Meanwhile, students are allowed to trade more actively if they would like to.

EMPIRICAL EVALUATION OF STUDENT PERFORMANCE

The authors gather student trading report scores from three sections taught over year 2015-2016, including two online sections and one on-campus section. There are 105 undergraduate students in the sample, with 80 finance majors and 25 non-finance majors. Among the 105 students, 86 are online and 19 are on campus. The authors compare the performance of students by delivery method, and report the results in Table 2 (Appendix). The authors do not find that online students significantly underperform the on-campus ones in the trading reports. Their average trading report scores are comparable, with a difference of only .41 out of 100. A two-sample student *t* test assuming unequal variance suggests no significant difference. For finance students, the online students' average is 1.78 point lower, but it is not significantly different. While the online scores of nonfinance majors are 9 points higher than the on-campus scores, the difference is not statistically significant either. Due to the small sample of on-campus non-finance majors, the low average is actually driven by one student who earns a much lower score than the others. Overall, online students do not perform significantly different from their on-campus peers on the trading game reports.

CONCLUSION

The authors present a teaching exercise using real-time trading platform in an online international finance course with heterogenous student backgrounds. The purpose of the trading game is to enhance student understanding of the foreign exchange market and foreign exchange rate determination theories. For online students, the trading game also provides extra means of engaging students, and promoting instructor-student and student-student interactions. The authors find that preparation is essential to the success of the trading game, both technically and mentally. In addition, the authors discuss how they build flexibility in the implementation of the game to accommodate to the different needs and preferences of students. An examination of student performance on the trading game report reveals no statistically significant difference in the online and on-campus courses.

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APPENDIX

Table 1.
Sample of trading game FAQs

Q1	I could not log in. I am sure I entered the right username and password. What's going on?
A1	First, make sure you do have the right username and password. Second, make sure you have "FXTrade Practice" instead of "FXTrade" under "Account." If you still cannot login, go through the list here: http://fxtrade.oanda.com/support/troubleshooting/
Q2	The website lets me log in, but after it says that it is loading the platform, it doesn't do anything. I leave it running and wait, but yet nothing happens. What should I do?
A2	Check if you have the latest Java. If you are not sure you have it or not, click https://fx2.oanda.com/java/clock/ . If you see a very simple Java clock applet, you have it. If you see a "broken link" image, or gray box instead, you will need to install Java (http://www.java.com/en/download/index.jsp). By the way, it is free! If this still does not work, you might need to clear your cache. If you don't know how, google "clear cache." After clearing cache, please remember to reboot your computer before proceeding to the next step to allow your system to be in a 'clean' state.
Q3	I don't get it. I want to buy Japanese Yen, but where is the price of Japanese Yen?
A3	Exchange rates are quoted in currency pairs. In your case, you need to be looking for USD/JPY. If you want to buy euro instead, look for EUR/USD. For details, check out here: http://fxtrade.oanda.com/learn/basics/rates_and_spread
Q4	I got all confused over the trading platform—too many things there. Is there a buy button?
A4	Yes, you can hit the "account" tab on the top to find it. Or you can click the currency pair you'd like to trade, and then you will see the "buy" or "sell" buttons appearing…
Q5	OK. I find the buy/sell button. Now how do I buy?
A5	Depending on how your currency is quoted. In forex trading, you place an order to buy (go long) or sell (go short) the first currency in a currency pair at current exchange rates. Buying EUR/USD means that you are buying Euros (EUR) using US Dollars (USD). Selling EUR/USD means that you are buying US Dollars (USD) using Euros (EUR). If you happen to have a currency pair that is quoted as USD/Currency (e.g., USD/JPY), and you hit buy, you actually buy USD and sell JPY. So if you want to buy Japanese Yen, hit the "Sell" button instead. For more information, see http://fxtrade.oanda.com/learn/basics/the_basics.shtml.
Q6	Wait… I need to put the number of units to trade. How many do I put?
A6	The number of unit refers to the first currency of a pair. For example, if you want to buy JPY, which is quoted as USD/JPY, you can sell 100,000 units of "USD/JPY" without using any leverage. Here the 100,000 units refers to USD100,000. Of course, you can use leverage, but please be aware that it will magnify your profit/loss (See Q10).
Q7	Now that I have bought the currencies, how do I make sure I bought the right amount of the right currency as I intended? (Sorry… cannot be too careful!)
A7	If you have invested already, you can check "Exposures". If you bought JPY, you should see that you have a short position in USD, and a long position in JPY. Also, you can see how many units of USD you have shorted, and how many of JPY you have bought.
Q8	Oops—I didn't see the answer to Q5. I intended to buy Japanese Yen, but I ended up selling Japanese Yen and buying US Dollar. Now what should I do?
A8	Good thing you are not playing with real money☺ You can leave it as it is, which should

	not affect your grade on the trading report. Even thought you took the opposite trade on USD/JPY, you can still report your account value, factors having affected your account, and the rest as outlined in the syllabus. Of course, your account value might not be as impressive as you expected, but that is really not what we focus on in the game. Instead, the goal of the game is to help you get a sense of what the real FX market is like.
Q9	Where is my investment?! I remembered I did buy a foreign currency, but now I checked my account. It is gone!!! What is happening?
A9	Good thing you are not playing with real money☺ It has to do with the margin requirement. Margin is the collateral you put with your broker to cover possible losses. There is a certain requirement on margin depending on your account balance. If your loss accumulates to a certain amount, you will receive a margin call, and if the margin call is unanswered, your position will be closed, as you have experienced.
Q10	My currency did not depreciate that much. How come I had so much loss to trigger a margin call?
A10	You might have used too much leverage. Basically, even if you don't have the currency, you can still borrow from the broker and sell it. The problem with leverage is that it can magnify your profit or loss. If the currency moves against you, it's likely that you will suffer huge losses (of course, for some of you who bet right, leverage is working in your favor and producing huge profits). In the past, I have seen students lost more than half of their initial investment in merely a couple of weeks—and of course, they triggered margin call and were left puzzling why their position was automatically closed. By the way, with Oanda, you are allowed to use leverage up to 50:1! (Please see http://fxtrade.oanda.com/learn/basics/margin_calculations.shtml for details).
Q11	Now that my position is closed before the game even ends. What should I do?
A11	Well, keep cool and move on. As for Q8, You can leave it as it is, which should not affect your report. Or you can reinvest in other currencies if you'd like to.
Q12	How do I calculate my profit or loss?
A12	Check out here with a lot of examples: http://fxtrade.oanda.com/learn/basics/how_to_calculate_profit_or_loss

Table 2.
Student performance on trading game report: Online vs. On-campus

	Online	On-campus	Difference	t statistic
Finance Majors	82.09	83.87	-1.78	-0.32
	(n=65)	(n =15)		
Non-Finance Majors	79.76	70.75	9.01	0.46
	(n =21)	(n =4)		
Combined	81.52	81.11	0.41	0.07
	(n =86)	(n =19)		