

**Can Students Studying Abroad use Forward
Exchange Rates as a Tool for Better Budgeting
Their Semesters?**

The Honors Program

Final Report

Student: Emalee Dunbar

Faculty Sponsor: Andres Ramirez

Editorial Reviewer: Hakan Saraoglu

April 2018

Can Students Studying Abroad use Forward Exchange Rates as a Tool for Better Budgeting Their Semesters?

Senior Capstone Final Report for Emalee Dunbar

Table of Contents

I. INTRODUCTION 1

II. LITERATURE REVIEW 3

 i. Introduction..... 3

 ii. Background/History..... 4

 iii. Review 5

 iv. Eugene Fama’s Research..... 5

 v. Risk Premium..... 6

 vi. Further Research 7

 vii. Other Methods at Solving EMH..... 8

 viii. Conclusions 10

III. RESEARCH QUESTIONS 10

IV. RESEARCH METHODOLOGY 11

V. ETHICAL CONSIDERATION 11

VI. SURVEY RESULTS 12

VII. DATA COLLECTION..... 13

VIII. DATA ANALYSIS 14

IX. LIMITATIONS AND REMARKS..... 15

Can Students Studying Abroad use Forward Exchange Rates as a Tool for Better Budgeting Their Semesters?

Senior Capstone Final Report for Emalee Dunbar

X. CONCLUSIONS..... 16

XI. REFERENCES 18

XII. APPENDIX 23

 Appendix I: International Parity Conditions..... 23

 Appendix II: Survey Questions and Responses 24

 Appendix III: Summary of Results 26

Can Students Studying Abroad use Forward Exchange Rates as a Tool for Better Budgeting Their Semesters?

Senior Capstone Final Report for Emalee Dunbar

I. INTRODUCTION

Traveling abroad requires an immense amount of planning and attention to detail. Budgeting is a difficult task in one's own country, but when planning across borders, that task becomes even greater. Differences in exchange rates and buying power have the potential to adversely affect the budget set ahead of time, placing more stress on the traveler. Financial tools available in the foreign exchange market, if used strategically, may provide a reliable method to budgeting travel abroad as accurately as possible. There are many individuals, students especially, that plan on traveling or studying abroad yet are on tight budgets. Having a reliable budgeting tool that works to hedge against risk can make a difference in their ability to travel abroad.

From firsthand experience, I know the effects of poor budgeting when abroad. In the fall of 2016, I studied in France for four months. I did not review trends in the foreign exchange market nor look into the differences in purchasing power before planning my budget. This flaw left me susceptible to fluctuations in exchange rates when exchanging money periodically throughout my time in France, as well as in other countries that did not accept the Euro. I did not evaluate the purchasing power of the places I traveled to and ended up paying higher prices than for what I budgeted. When traveling to the Czech Republic, for example, I exchanged Euros into Korunas for what was seemingly a good rate of Kč27.02/€. Exchanging €100 for Kč2,702 seemed to give me a lot of money spend while in Prague. The feeling of being rich quickly faded when one cab ride cost Kč750 and a meal for three was Kč1,200. Just these two expenditures took away nearly three fourths of the money budgeted for a two-day trip of the city. Had I done research on the purchasing power in the Czech Republic, I would have been aware of the high prices in the

Can Students Studying Abroad use Forward Exchange Rates as a Tool for Better Budgeting Their Semesters?

Senior Capstone Final Report for Emalee Dunbar

country and been able to budget more effectively. This is a problem to which any person traveling abroad can be exposed. By working to find a tool for better budgeting for travel abroad, I hope to aid others plan their future travels.

In efforts to find a reliable method of forecasting expenses to properly budget travel abroad, I plan on tracking the forward exchange rates of various currencies in relation to the US dollar and comparing them to the spot rates at the future times. Tracking the differences in the forward rate and the spot rate at the given date, I will be able to determine if forward rates are in fact optimal predictors of future spot rates. I will look for trends such as the possibility of the time period of the forward rates relating to the accuracy of the predictions, or whether the forecasts of one currency are more reliable than those for another currency. Inflation rates will also be tracked for each currency. This will be used in efforts of determining the purchasing power between currencies. Keeping in mind the principles of the Relative Purchasing Power Parity, the accuracy of future spot rates in relation to inflation rates can also be determined. Evaluation of these methods will then be undertaken to determine if they are reliable in forecasting future spot rates and in turn be used as a budgeting tool.

FactSet, a financial data and analytics tool, will be used as a primary resource for finding financial data. Through using Bryant University's subscription to the service that is made available to all students, I will be able to pull historic spot rates, forward rates, interest rates, and inflation data.

This research will not only be geared to aiding students studying abroad, but can also be applicable to any person or groups of persons traveling abroad and using foreign currencies.

Can Students Studying Abroad use Forward Exchange Rates as a Tool for Better Budgeting Their Semesters?

Senior Capstone Final Report for Emalee Dunbar

Also, the findings that I hope to reach will add new data to the existing pool of research on this topic. While there has been research conducted in determining the reliability of forward rates and inflation rates as predictors of future spot rates, the methods of forecasting have changed over the years with increases in technology and therefore may be more accurate of a measure than when previously studied.

The remainder of this thesis will articulate the key processes and conclusions of the research.

The literature review analyzes research done by economists and academics on the subject.

Comparing and contrasting their results, the literature review sets a base from which the project can grow. The methodology section will detail the processes and procedures used to ultimately complete the project. Following the methodology details the results of the project and its conclusions.

II. LITERATURE REVIEW

i. Introduction

The question of market efficiency is one that has been discussed for years among financial analysts. In theory, the foreign exchange market operates off all available information and therefore should be efficient with no discrepancies. This hypothesis of efficient markets has been difficult to support and has shown some flaws in past studies. With the advancement in technology and forecasting procedures, the question of the validity of the efficient markets hypothesis may be answered. If the reliability of the hypothesis can be validated, then it can be applied to effective ways of budgeting travel abroad. As the world is becoming more global, the need for currency exchange is rising and therefore a tool for budgeting these transactions is in

Can Students Studying Abroad use Forward Exchange Rates as a Tool for Better Budgeting Their Semesters?

Senior Capstone Final Report for Emalee Dunbar

demand. The literature review will analyze different perspectives of financial analysts about their research and findings regarding the predictors of future spot rates and market efficiency.

ii. Background/History

International finance relies on a plethora of parities, theorems, and financial concepts that dictate the changes in the financial market. Having an understanding of the main principles of the foreign exchange market is necessary when conducting such research as proposed in this study. A spot exchange rate is the price set to exchange one currency to another in real time. Due to changes in supply and demand, like any commercial good, the price of the spot rate fluctuates. A forward exchange rate is an agreed upon price for the exchange of one currency to another at a specified future date. This is a contracted obligation between a bank and an investor that is used to hedge against risk in currency fluctuations. No matter what the spot rate is on the date of the forward contract, the two parties must use the agreed upon rate. Contracts with forward rates are often done in high denominations. International parity conditions prescribe relationships between different financial tools that reflects an efficient market. According to these conditions, the forward exchange rate should be equivalent to the future spot rate. The forward rates as predictors of future spot rates parity will be the leading focus of this research. As seen in Figure 1, located in Appendix I, this parity suggests that the forward exchange rate divided by the current spot rate is equal to the expected future spot rate divided by the current spot rate;

$$F_1^{ij} / S_0^{ij} - 1 = E[S_1^{ij}] / S_0^{ij} - 1 \text{ this can be rewritten as } F_1^{ij} = E[S_1^{ij}]$$

thus, the forward exchange rate is equal to the future spot rate. This relationship is derived from the hypothesis of market efficiency, meaning that exchange rates are determined with all

Can Students Studying Abroad use Forward Exchange Rates as a Tool for Better Budgeting Their Semesters?

Senior Capstone Final Report for Emalee Dunbar

available information taken into account. The other parities illustrated in Figure 1 involve the use of interest rates and inflation rates. These concepts have also been considered in the research regarding the accuracy of future spot rates.

For decades, these parities and conditions have been analyzed and researched by economists and financial analysts. A leading and praised researcher on the topic of market efficiency and the accuracy of forward exchange rates as predictors of future spot rates is Eugene Fama. The economist and Nobel Prize winner is often referred to as “The Father of Finance”. The literature review will focus on the findings developed by Fama and studies that were done after him developing upon his methods.

iii. Review

The validity of the Efficient Market Hypothesis is long contested amongst financial and economic scholars. As one of the most important issues in finance research, there have been numerous studies on whether or not the foreign exchange market is efficient. While heavy focus has been on the use of forward rates as predictors of future spot rates, the other international parities have been considered by researchers in their endeavors to prove the validity of the Efficient Market Hypothesis.

iv. Eugene Fama’s Research

One of the most regarded and cited studies seen in this collection of literature is that of Eugene Fama in 1984. With his Efficient Market Hypothesis in mind, Fama works to determine why variations have been seen between forward and future spot rates. In this work he finds that most of the variation in forward rates is that in premiums (Fama, 1984). This idea of a risk premium

Can Students Studying Abroad use Forward Exchange Rates as a Tool for Better Budgeting Their Semesters?

Senior Capstone Final Report for Emalee Dunbar

factored into the forward exchange rate is one that he and researchers after him have studied in detail. Fama claims that any premium in the forward rate can be explained in terms of the interest rate differential. According to Fama, the power of the forward exchange rate as a predictor of the future spot rate is obscured due the variation found in the premium associated with the forward exchange rate (Fama, 1984). The exact reason for the differences in the rates is not clear. One possibility suggested could be government intervention. With forward rates being determined by interest rates, and interest rates in turn determined by inflation levels, governments have the ability to adjust inflation rates that can adjust forward exchange rates. Other suggestions include deviations from purchasing power parity, and a *doomsday theory*, suggesting that rumors of bad news greatly effects the agents risk. While, as indicated, no clear results were derived from Fama's 1984 research, he did find that when comparing the 30-day forward rates to their respective future spot rates in nine currencies, the current spot rate showed to be a better predictor of the future spot rate rather than the current forward rate. In conclusion to his 1984 study, Fama determines that the forward exchange rate can be defined as the sum of a premium and the expected future spot rate. The proposed study will follow similar methods to those of Fama, in hopes to show if there have been evolutions in the foreign exchange market that make it more efficient.

v. Risk Premium

The notion of risk premium being a part of the forward exchange rate is a topic further studied by other researchers. For example, Nikitas Pittis conducted research in efforts to find the sources of the bias. He worked to determine if the differences can be attributed toward non-rational

Can Students Studying Abroad use Forward Exchange Rates as a Tool for Better Budgeting Their Semesters?

Senior Capstone Final Report for Emalee Dunbar

expectations, agents' risk adverse behavior, or both. His findings did further prove a bias in the forward exchange rate compared to the future spot rate, but he found it difficult to determine the source of the bias (Pittis, 1992). If there is a risk premium observed, like Pittis and Fama propose, then the study will look to determine if it is variable or constant. If a constant level of risk premium can be determined, then that can be used in predicting the future spot rates between currencies. No matter if the Efficient Market Hypothesis is validated or not with the findings of this research, if a constant risk premium is identifiable, then a method of budgeting can be derived.

vi. Further Research

Tests have been conducted over the years using different currencies and time periods, yet there is no concise conclusion. In a study conducted in 2002, Madhu Vij tested the differences among one, three, and six-month forward exchange rates to the future spot rates of several currencies. The basis of the research was done off the findings of Eugene Fama's 1984 study. The results of her tests varied for different currencies. As a result of the study, the hypothesis was discredited and it was determined that forward rates are not unbiased predictors of future spot rates. The study did show, however, that for the Yen, the longer period of time the forward rate was for, the closer it was to the future spot rate (Vij, 2002). While this did not occur for the other currencies tested in this data set, it does show some hope that this method may work for some currencies in the future. Vij concludes with the suggestion that there are fundamental inefficiencies in the foreign exchange market that prevent the rates from fully reflecting economic information (Vij, 2002).

Can Students Studying Abroad use Forward Exchange Rates as a Tool for Better Budgeting Their Semesters?

Senior Capstone Final Report for Emalee Dunbar

A similar study to that of Vij was conducted by Soenen and Winkel in 1988. Well aware of the inconclusiveness of previous studies, Soenen and Winkel took different measures in their testing. The results of a comparison of one and three-month forward rates to their respective future spot rates showed that there were differences between the rates (Soenen, 1988). However, they did find the one-month rates to be more accurate predictors with less of a variation. They also considered the theory of there being a variable risk premium that can account for the differences in the rates. The pair claims that despite the presence of bias, the forward rate should not be disqualified from being a usable predictor of future spot exchange rates.

vii. Other Methods at Solving EMH

Traditional methods of comparing forward and future spot rates have been rejected by study after study. Some researchers have started to look into other methods of solving the efficient market hypothesis. Pittis furthered his 1992 study by testing other international parity conditions to determine if either of those were better predictors of the future spot rate. However, the use of the Relative Purchasing Power Parity did not show clear results for all of the currencies tested (Pittis, 1992). Another alternative method of testing market efficiency is the use of interest rates. Hung-Gay Fung looks at the forward market from the perspective of a multinational firm. Fung suggests that the forward price is the dependent factor for a firm's international trade decisions and that the forward price is determined by a combination of the interest rate and the expected forward rate (Fung, 1991). A stronger emphasis on the relationship between the interest rate and forward rate is placed on Fung's study.

Can Students Studying Abroad use Forward Exchange Rates as a Tool for Better Budgeting Their Semesters?

Senior Capstone Final Report for Emalee Dunbar

Similar to Fung, Yuichi Fukuta and Makoto Saito look into the effects of liquidity on the forward discount puzzle. A monetary injection can negatively affect nominal interest rates, which as shown by Fama and others has an effect on the forward exchange rates and the expected future spot rates (Fukuta,2002). While effects of liquidity can be observed on the forward exchange rates, Fukuta and Saito suggest that further research should be done. Suggestions include models to be constructed using changes in the Relative Purchasing Power Parity.

Alan Shapiro, who also looks into budgeting strategies for multinational corporations, focuses on the use of inflation rates in comparison to exchange rates. He highlights the effects that changes in inflation rates have on a corporation's cash flow. While no direct research is done in this study on the effects of inflation changes on future spot rates, the importance of it is revealed. The effects of inflation described by Shapiro can be used in further research on market efficiencies.

Another method put forth by Nikolaou and Sarno (2006) suggests the use of the options market instead of the forward market when predicting future spot rates. They produce an option-equivalent contract that can be considered a synthetic forward contract (Nikolaou, 2006).

Through testing both forward exchange rates and the option-equivalent, the researchers found that there was a similar bias to measures. The results of this study do suggest that the synthetic forward is however, a good predictor of the future spot rate (Nikolaou, 2006).

The different methods conducted by researchers has shown that there is no one way to validate the Efficient Market Hypothesis. Understanding the methods and outcomes used by previous researchers can only benefit in the development of future studies. Reflecting on the findings in

Can Students Studying Abroad use Forward Exchange Rates as a Tool for Better Budgeting Their Semesters?

Senior Capstone Final Report for Emalee Dunbar

the literature, I plan to run similar tests that hope to reveal any changes toward efficiency in the foreign exchange market.

viii. Conclusions

The common trend among the studies that have been reviewed is that there has been no clear answer in the research of the causes for forward bias and market inefficiencies. While there have not been any clear cut answers, researchers such as Soenen and Winkel (1988) do still believe that the forward rate can be used as a predictor of the future spot rate. The research that I am conducting will take into consideration the methods and results of the studies before it and be cautious of the patterns seen previously. Expanding upon the use of inflation rates as well as relative purchasing power in predicting future spot rates will be another course of action taken in this study that will hope to expand upon Pittis' (1992) results. The current literature leaves a lot of questions unanswered; those are the questions I'm hoping this research can answer.

III. RESEARCH QUESTIONS

The aim of this research thesis is to determine if the foreign exchange market is efficient and how financial tools can be used to budget travel abroad. The first goal is to determine if the market is efficient. The second focus on the project is to determine how to use the market, whether efficient or not, to aid in budgeting for travel abroad. While individuals are not expected to lock into forward rates, they may use them as a point of reference to what expectations are for exchange rates and when is the best time to convert money during their time abroad.

Can Students Studying Abroad use Forward Exchange Rates as a Tool for Better Budgeting Their Semesters?

Senior Capstone Final Report for Emalee Dunbar

IV. RESEARCH METHODOLOGY

As outlined in the prior section, there are many pieces to solving the puzzle of efficient markets. In order to fully test the EMH, my research will be broken down into two main mythologies. The first will be to design and administer a survey in order to understand where students study abroad, how much they spend, and what current budgeting habits they use. This will determine which currencies I should focus my research on, and how much currency risk exposure an average student has during their time abroad. The next phase of my research will be focused on the financial market. I will utilize FactSet as a primary means for obtaining key financial data for the chosen currencies. The data collected will then be analyzed and tested using the Forward Rates as Predictors of Future Spot Rates parity as well as the other parity conditions as seen in Figure 1. From here I will be able to determine if the parities hold. If not and a risk premium is observed as Pittis hypothesized, then I will determine if it is a constant that can be used in predicting future spot rates. Bringing these two aspects of my research together I aim on being able to suggest tools and methods for budgeting travel abroad.

V. ETHICAL CONSIDERATION

With any survey and involvement of human subjects in research, there are ethical considerations to take in account. I will be asking respondents to disclose some financial information that they may not feel comfortable revealing. The survey used in this study has been approved by the IRB at Bryant University. At the start of the survey, participants must agree to a request for consent detailing that responses to survey questions are anonymous.

Can Students Studying Abroad use Forward Exchange Rates as a Tool for Better Budgeting Their Semesters?

Senior Capstone Final Report for Emalee Dunbar

VI. SURVEY RESULTS

The survey was generated and administered to Bryant University students that completed a semester abroad. There were 110 participants in the study. Survey questions and responses can be found in Appendix II. The survey has three general purposes: 1. Determine where Bryant students choose to study abroad and thus which currencies should be studied, 2. How much students spend while abroad and what items are they spending it on, and 3. What their habits and sentiments are towards budgeting. Of the survey respondents, 47% reported that they studied in either Italy, France, or Spain. The remainder of the students studied in Australia (15%), Chile (10%), China (8%), England (7%), or Other (13%). This led me to inevitably choose the Euro, Australian Dollar, Chilean Peso, Chinese Yuan, and Great British Pound as the currencies to be studied in this thesis. With the currencies chosen, I looked to see how much exposure to currency risk these students had. To do this I asked each respondent to disclose how much in total they spent in terms of USD during their time abroad. Respondents were asked to choose from \$500 interval ranges to identify their spending totals. Results ranged from \$500- \$1,000 to \$6,000 +. The median range was \$5,000 - \$5,500 and mean \$4,500 - \$5,000. This shows that a semester abroad represents a high dollar value and can be highly susceptible to currency risk; thus a tool to that can help students mitigate the risk to which they are exposed is in demand.

Students also responded to some quantitative questions that focused on budgeting habits, their reflective opinions on their semesters, and experience with financial markets. When asked if they agreed with the statement “I feel as though I adequately budgeted my semester ahead of time”, 20% indicated that they strongly agree and 45% somewhat agreed. This left 27% of students on

Can Students Studying Abroad use Forward Exchange Rates as a Tool for Better Budgeting Their Semesters?

Senior Capstone Final Report for Emalee Dunbar

the disagreeing side and 7% neutral. Those 27% could have benefited from access to more information and suggestions on how to budget finances ahead of time, which is the goal of this research thesis. To move further with this, when asked if students agree with the statement “my school provided me with techniques to better budget my semester”, only 29% agreed either strongly or somewhat. This result shows that Bryant students are looking for more in terms of the assistance Bryant can offer in preparing for the abroad experience.

Other notable questions asked in the survey were financially related. One question asked if students tracked the exchange rate of the country’s currency compared to the US Dollar when budgeting their semesters. There was a great response of just under 60% of the respondents indicating that they tracked the exchange rates. In response to the question “are you familiar with financial tools that are used to hedge against currency risk such as forward exchange rates?” 66% indicated either yes or maybe. These students only, not those that responded no, were then asked a follow-up question of “before going abroad did you consider using forward exchange rates to help in budgeting your semester?” To this question only 14% responded with a yes. This indicates that not many students have considered using foreign exchange market tools and can benefit from learning more about how they can use them to their advantage.

VII. DATA COLLECTION

After determining what currencies I would be tracking from the survey results, I then had to determine where to find the data that I need. In order to assess all of the International Parity Conditions pictured in Appendix I, I was in need of a lot of data. For historical spot rate data, I used OFX, an online foreign exchange company based in Sydney, Australia. I was able to pull

Can Students Studying Abroad use Forward Exchange Rates as a Tool for Better Budgeting Their Semesters?

Senior Capstone Final Report for Emalee Dunbar

years of daily spot rate history from the site in the following currency pairs: AUDUSD, EURUSD, GBPUSD, USDCLP, and USDCNY. When looking for historical forward rates, I utilized the financial database source FactSet. For each currency pair, I was able to pull historical 30-day, 90-day, and 1 year forward rates from 2005 to present. Historical interest rates for government bills in the three time periods were pulled from FactSet for all countries except Australia. The Federal Reserve Economic Database was utilized to retrieve interest rates for Australia. It can be observed in the figure in Appendix I that four out of the five parity conditions require use of expected values being either expect future spot rates or expected inflation rates. Due to the fact that historic measures are being used, an ex-post approach will be taken and realized rates will be used rather than expected. Consumer Price Index levels were pulled from FactSet in terms of percentage change from the previous period in monthly, quarterly, and yearly intervals. Australian CPI levels are released quarterly and thus I was unable to retrieve monthly data for this variable (6401.0 - Consumer Price Index, Australia, Dec 2017). All of this data was organized into various excel spreadsheets and primed for analysis.

VIII. DATA ANALYSIS

In order to determine if the market is efficient and if parity conditions hold, I developed excel documents for each currency pair, AUDUSD, USDCLP, etc., that analyzed the data. With the data described in the previous section, each of the four equations in the International Parities diagram, Appendix I, were computed at each time frequency level. They were then matched up as prescribed by the parity conditions. Because the hypothesis dictates that through these parity conditions each pair of equations will result in an equal value, the pairs were subtracted from one

Can Students Studying Abroad use Forward Exchange Rates as a Tool for Better Budgeting Their Semesters?

Senior Capstone Final Report for Emalee Dunbar

another in hopes that a zero will be returned; the zero would indicate that the pair is equal and parity holds. This was done for each currency pair, in all five parities, and in all three time intervals from January 2005 – December 2017. Once all computations were completed, an average of the variance from zero was taken. This will aid in determining how much, on average, each parity condition per time interval strays from zero. Depicted in Appendix III, charts for each currency have been computed and color coded to indicate which time interval for each parity is the closest to holding parity and equating zero.

IX. LIMITATIONS AND REMARKS

A striking result in the data was the results in the Interest Rate Parity calculations. An aspect of the diagram of parity conditions seen in Appendix I, is that all of the lines but the one representing the Interest Rate Parity are dashed. The outlier is solid for the reason that it is the only condition where if calculated in real time, all of the needed data is available; there is no need to set expectations. Due to this, the parity should always hold. If not, there is room for arbitrage.

Viewing the data postmortem reveals the discrepancy in the Interest Rate Parity. Rather than using the interest rate on T-bills and T-bill equivalents for each country, a better, more accurate approach may have been to pull deposit rate data instead. With the new set of data, changes in the accuracy of the Uncovered Interest Rate Parity and International Fisher Relation may occur as well. Re-implementing the process with the different data set would be of pertinence for a continuation in the research and a more accurate prescription for using parity conditions in forecasting changes in spot rates.

Can Students Studying Abroad use Forward Exchange Rates as a Tool for Better Budgeting Their Semesters?

Senior Capstone Final Report for Emalee Dunbar

In addition, as noted in the data collection section, there were some difficulties in finding all of the required data for each time frame and currency pair. This lack of monthly inflation rates for Australia did skew the results for that particular currency set. In addition, there were some observed holes in the data with a few points missing here and there in the data set. Perhaps with a more thorough search in the data and the use of sources beyond FactSet and FRED, these holes could have been filled and more accurate results may be presented.

X. CONCLUSIONS

Unlike what was predicted by Fama (1984), there was no consistent, measurable risk premium observed in the data. Variance from zero, from the parity holding, were not constant and were varying in being positive or negative. The discrepancy in the sign of the variance demonstrates that one side of the equation is not consistently greater than or less than the other. While these results are discouraging and add to the previous consensus by researchers that the market is not efficient, there are still conclusions that can be made on how the parity conditions can aid in budgeting. As seen in the charts in Appendix III, some parity conditions hold closer to parity at certain intervals of time than others (those colored in green). For example, if one was going to the Chile, it would be best to observe the forward rates on a monthly basis and determine at which point in time the exchange rate is most in favor of the US Dollar holder and plan the transaction between currencies for that time. While this does not provide utmost certainty and protection from currency risk, it does help gauge what the exchange rate will be at a given time and allow for precautions to be taken to mitigate that risk. The results from this study aim to provide a tool for travelers to assist them in planning their travels and being more aware of the

Can Students Studying Abroad use Forward Exchange Rates as a Tool for Better Budgeting Their Semesters?

Senior Capstone Final Report for Emalee Dunbar

risk fluctuations in currencies can pose while abroad. With these financial parities and behaviors observed in the study, travelers can gain a better insight on how to predict changes in exchange rates and plan when would be the most advantageous time for them to act in the foreign exchange market as a US dollar holder.

Can Students Studying Abroad use Forward Exchange Rates as a Tool for Better Budgeting Their Semesters?

Senior Capstone Final Report for Emalee Dunbar

XI. REFERENCES

Australian Bureau of Statistics. (2018, January). Consumer Prices - Australia. Retrieved from FactSet database.

Callen, J. L., Chan, M. W. L., & Kwan, C. C. Y. (1989). Spot and forward exchange rates: A causality analysis. *Journal of Business Finance & Accounting*, 16(1), 105. Retrieved from <http://bryant.idm.oclc.org/login?url=http://search.proquest.com/docview/237033291?accountid=36823>

Callier, P. (1980). Speculation and the Forward Foreign Exchange Rate: A Note. *The Journal of Finance*, 35(1), 173-176. doi:10.2307/2327189

Cornell, B., & Reinganum, M. (1981). Forward and Futures Prices: Evidence from the Foreign Exchange Markets. *The Journal of Finance*, 36(5), 1035-1045. doi:10.2307/2327298

Chile National Institute of Statistics. (2018, January). Consumer Prices - Chile. Retrieved from FactSet database.

Eurostat. (2018, January). Harmonized Consumer Prices - Eurozone. Retrieved from FactSet database.

FactSet Research Systems. (n.d.) FactSet Interest Rates. Retrieved February 24, 2018, from FactSet database.

FactSet Research Systems. (n.d.) FactSet Prices: Forward History. Retrieved February 24, 2018, from FactSet database.

Can Students Studying Abroad use Forward Exchange Rates as a Tool for Better Budgeting Their Semesters?

Senior Capstone Final Report for Emalee Dunbar

- Fama, E. F. (1984). Forward and spot exchange rates. *Journal of Monetary Economics*, 14, 319–338. Retrieved from http://eml.berkeley.edu/~craine/EconH195/Fall_13/webpage/Fama_Forward%20Discount.pdf
- Fama, E., & Farber, A. (1979). Money, Bonds, and Foreign Exchange. *The American Economic Review*, 69(4), 639-649. Retrieved from <http://www.jstor.org/stable/1808709>
- Frydman, R., & Goldberg, M. (2011). Castles in the Air: The Efficient Market Hypothesis. In *Beyond Mechanical Markets: Asset Price Swings, Risk, and the Role of the State* (pp. 81-102). Princeton University Press. Retrieved from <http://www.jstor.org/stable/j.ctt7s0v8.9>
- Fukuta, Y., & Saito, M. (2002). Forward discount puzzle and liquidity effects: Some evidence from exchange rates among the United States, Canada, and Japan. *Journal of Money, Credit, and Banking*, 34(4), 1014-1033. Retrieved from <http://bryant.idm.oclc.org/login?url=http://search.proquest.com/docview/195357334?accountid=36823>
- Fung, H., & Lai, G. C. (1991). Forward market and international trade. *Southern Economic Journal*, 57(4), 982. Retrieved from <http://bryant.idm.oclc.org/login?url=http://search.proquest.com/docview/212104338?accountid=36823>
- Hakkio, C. (1981). Expectations and the Forward Exchange Rate. *International Economic Review*, 22(3), 663-678. doi:10.2307/2526167

Can Students Studying Abroad use Forward Exchange Rates as a Tool for Better Budgeting Their Semesters?

Senior Capstone Final Report for Emalee Dunbar

Hansen, L., & Hodrick, R. (1980). Forward Exchange Rates as Optimal Predictors of Future Spot Rates: An Econometric Analysis. *Journal of Political Economy*, 88(5), 829-853.

Retrieved from <http://www.jstor.org/stable/1833137>

Hoover, D. K. (1992). Business economists: Not just forecasters. *Business Economics*, 27(3), 56.

Retrieved from

<http://bryant.idm.oclc.org/login?url=http://search.proquest.com/docview/199809516?accountid=36823>

International Monetary Fund, Interest Rates, Government Securities, Treasury Bills for Australia

[INTGSTAUM193N], retrieved from FRED, Federal Reserve Bank of St. Louis;

<https://fred.stlouisfed.org/series/INTGSTAUM193N>

International Money Transfers & Currency Exchange. (n.d.). Retrieved from

[https://www.ofx.com/en-](https://www.ofx.com/en-us/?cid=1102&gclid=EAIaIQobChMI77aiwczL2gIV01uGCh3FUgwMEAAAYASAAEgJILPD_BwE&gclid=CK6j3sLMY9oCFcZBNwodGQIChg)

[us/?cid=1102&gclid=EAIaIQobChMI77aiwczL2gIV01uGCh3FUgwMEAAAYASAAEgJILPD_BwE&gclid=CK6j3sLMY9oCFcZBNwodGQIChg](https://www.ofx.com/en-us/?cid=1102&gclid=EAIaIQobChMI77aiwczL2gIV01uGCh3FUgwMEAAAYASAAEgJILPD_BwE&gclid=CK6j3sLMY9oCFcZBNwodGQIChg)

National Bureau of Statistics of China. (2018, January). Consumer Prices - China. Retrieved from FactSet database.

Nikolaou, K., & Sarno, L. (2006). New evidence on the forward unbiasedness hypothesis in the foreign-exchange market. *Journal Of Futures Markets*, 26(7), 627-656.

doi:10.1002/fut.20211

Can Students Studying Abroad use Forward Exchange Rates as a Tool for Better Budgeting Their Semesters?

Senior Capstone Final Report for Emalee Dunbar

- Pittis, N. (1992). Causes of the forward bias: Non-rational expectations versus risk premia. *Applied Economics*, 24(3), 317. Retrieved from <http://bryant.idm.oclc.org/login?url=http://search.proquest.com/docview/212693420?accountid=36823>
- Shapiro, A. C. (1978). Capital budgeting for the multinational corporation. *Financial Management*, 7(1), 7. Retrieved from <http://bryant.idm.oclc.org/login?url=http://search.proquest.com/docview/208193100?accountid=36823>
- Smith, J. A., Valdes, F. F., & Zeetser, O. V. (1994). Fluctuating currency budget management. *Transactions of AACE International*, 1994, 7. Retrieved from <http://bryant.idm.oclc.org/login?url=http://search.proquest.com/docview/208181969?accountid=36823>
- Soenen, L. A., & van Winkel, E. G. F. (1988). Predicting future spot rates on the basis of forward rates-. *Quarterly Journal of Business and Economics*, 27(3), 57. Retrieved from <http://bryant.idm.oclc.org/login?url=http://search.proquest.com/docview/194734256?accountid=36823>
- UK Office for National Statistics. (2018, January). Consumer Prices - United Kingdom. Retrieved from FactSet database.
- U.S. Bureau of Labor Statistics. (2018, January). Consumer Prices - United States. Retrieved from FactSet database.

Can Students Studying Abroad use Forward Exchange Rates as a Tool for Better Budgeting Their Semesters?

Senior Capstone Final Report for Emalee Dunbar

Vij, M. (2002). Forward foreign exchange rates as an unbiased predictor of future spot rates: The empirical evidence. *Journal of Management Research*, 2(2), 79-86. Retrieved from <http://bryant.idm.oclc.org/login?url=http://search.proquest.com/docview/237226535?accountid=36823>

6401.0 - Consumer Price Index, Australia, Dec 2017. (2018, January 31). Retrieved from <http://www.abs.gov.au/Ausstats/abs@.nsf/0/CFFA42B90CA68CD2CA25765C0019F281?OpenDocument>

Can Students Studying Abroad use Forward Exchange Rates as a Tool for Better Budgeting Their Semesters?

Senior Capstone Final Report for Emalee Dunbar

XII. APPENDIX

Appendix I: International Parity Conditions

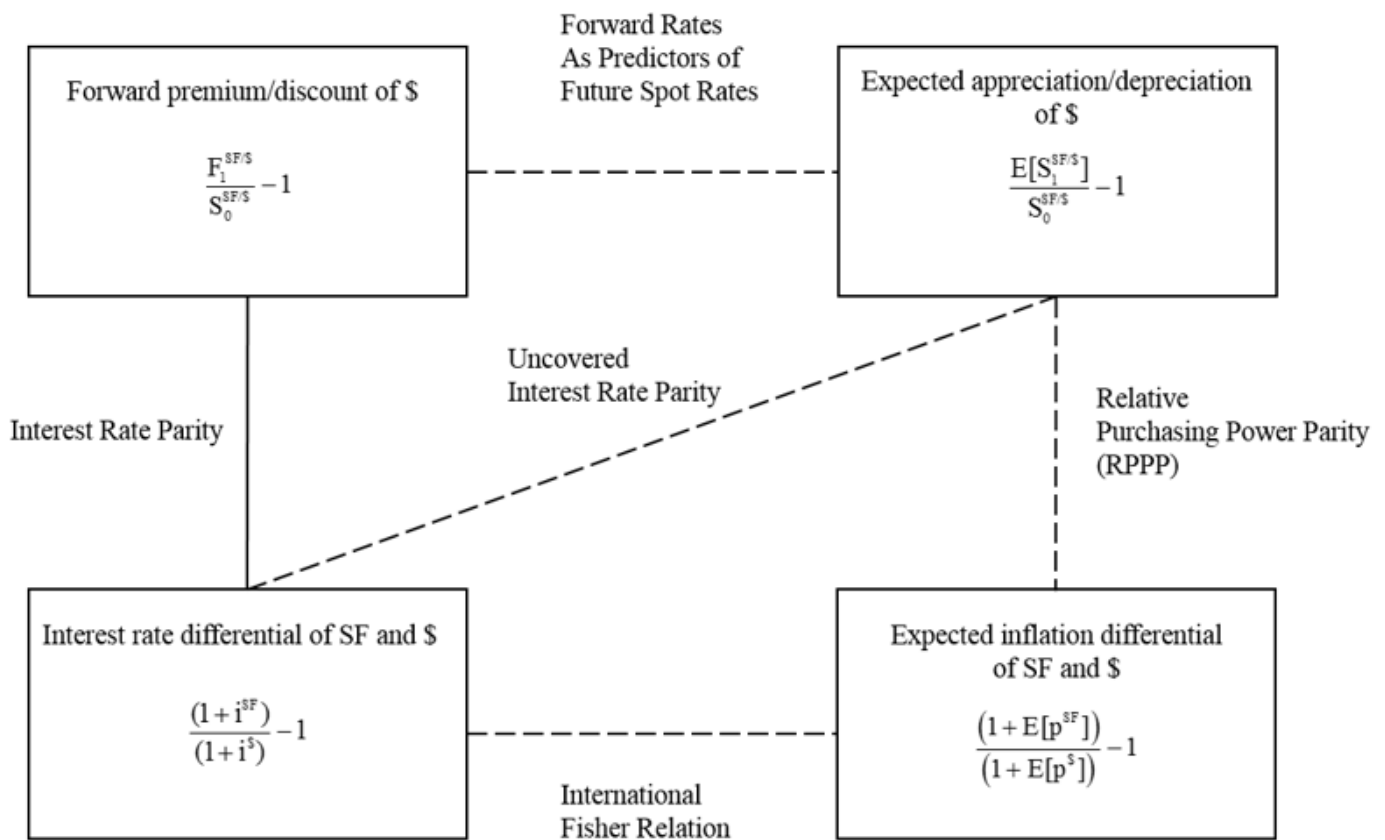


Figure 1 The International Parity Conditions of the Foreign Exchange Market

(H. Saraoglu, lecture notes, February 27, 2017)

Can Students Studying Abroad use Forward Exchange Rates as a Tool for Better Budgeting Their Semesters?

Senior Capstone Final Report for Emalee Dunbar

Appendix II: Survey Questions and Responses

Q1 Have you participated in your school's study abroad program?

Q2 In which country did you study abroad?

	Australia	Chile	China	England	France	Italy	Spain	Other
Count	17	11	9	8	13	16	23	14
Percentage	15.32%	9.91%	8.11%	7.21%	11.71%	14.41%	20.72%	12.61%

Q3 When were you abroad?

	Fall 2016	Winter 2017	Spring 2017	Summer 2017	Fall 2017
Count	50	1	10	0	44
Percentage	47.62%	0.95%	9.52%	0.00%	41.90%

Please indicate the extent to which you agree with the following statements

Q4 I feel as though I adequately budgeted my semester ahead of time

	Strongly Agree	Somewhat Agree	Neither Agree nor Disagree	Somewhat Disagree	Strongly Disagree
Count	22	50	8	24	6
Percentage	20.00%	45.45%	7.27%	21.82%	5.45%

Q5 Before arriving in country, I researched the prices of products that I buy frequently

	Strongly Agree	Somewhat Agree	Neither Agree nor Disagree	Somewhat Disagree	Strongly Disagree
Count	4	24	9	37	36
Percentage	3.64%	21.82%	8.18%	33.64%	32.73%

Q6 In preparation for my semester abroad, I tracked the exchange rate of the country's currency compared to the US Dollar to help budget my semester

	Strongly Agree	Somewhat Agree	Neither Agree nor Disagree	Somewhat Disagree	Strongly Disagree
Count	27	39	13	17	15
Percentage	24.32%	35.14%	11.71%	15.32%	13.51%

Q7 My school provided me with techniques to better budget my semester

	Strongly Agree	Somewhat Agree	Neither Agree nor Disagree	Somewhat Disagree	Strongly Disagree
Count	4	28	31	27	21
Percentage	3.60%	25.23%	27.93%	24.32%	18.92%

Can Students Studying Abroad use Forward Exchange Rates as a Tool for Better Budgeting Their Semesters?

Senior Capstone Final Report for Emalee Dunbar

Q8 Are you familiar with financial tools that are used to hedge against currency risk such as forward exchange rates?

	Yes	Maybe	No
Count	58	16	37
Percentage	52.25%	14.41%	33.33%

Q9 Before going abroad did you consider using forward exchange rates to help in budgeting your semester? (Note shown to "Yes" or "Maybe" responses above)

	Yes	No
Count	11	63
Percentage	14.86%	85.14%

Q10 Please describe how you used forward exchange rates as part of your budgeting techniques (Note shown to "Yes" responses above)

Q11 What range best fits your total expenses while abroad?

	\$500 - \$1,000	\$1,000 - \$1,500	\$1,500 - \$2,000	\$2,000 - \$2,500	\$2,500 - \$3,000	\$3,000 - \$3,500
Count	1	2	2	2	9	6
Percentage	0.94%	1.89%	1.89%	1.89%	8.49%	5.66%

	\$3,500 - \$4,000	\$4,000 - \$4,500	\$4,500 - \$5,000	\$5,000 - \$5,500	\$5,500 - \$6,000	\$6,000 +
Count	8	9	12	9	10	36
Percentage	7.55%	8.49%	11.32%	8.49%	9.43%	33.96%

Q12 Select the dollar range amount that best fits your expenses for the following categories:

Total Daily Expenses (i.e. lunch, coffee, etc.)

	Less Than \$500	\$500 - \$1,000	\$1,000 - \$1,500	\$1,500 - \$2,000	\$2,000 - \$2,500	\$2,500 - \$3,000
Count	35	31	13	17	2	5
Percentage	33.98%	30.10%	12.62%	16.50%	1.94%	4.85%

Transportation (i.e. buss passes, subway, etc.)

	Less Than \$500	\$500 - \$1,000	\$1,000 - \$1,500	\$1,500 - \$2,000	\$2,000 - \$2,500	\$2,500 - \$3,000
Count	79	16	5	1	1	1
Percentage	76.70%	15.53%	4.85%	0.97%	0.97%	0.97%

Travel and Excursions (i.e. flights, train tickets, hotels, etc.)

	Less Than \$500	\$500 - \$1,000	\$1,000 - \$1,500	\$1,500 - \$2,000	\$2,000 - \$2,500	\$2,500 - \$3,000
Count	10	10	23	19	20	21
Percentage	9.71%	9.71%	22.33%	18.45%	19.42%	20.39%

Flight - Arrical and Departure

	Less Than \$500	\$500 - \$1,000	\$1,000 - \$1,500	\$1,500 - \$2,000	\$2,000 - \$2,500	\$2,500 - \$3,000
Count	8	28	33	19	6	7
Percentage	7.92%	27.72%	32.67%	18.81%	5.94%	6.93%

Other

	Less Than \$500	\$500 - \$1,000	\$1,000 - \$1,500	\$1,500 - \$2,000	\$2,000 - \$2,500	\$2,500 - \$3,000
Count	22	21	16	6	5	7
Percentage	28.57%	27.27%	20.78%	7.79%	6.49%	9.09%

Can Students Studying Abroad use Forward Exchange Rates as a Tool for Better Budgeting Their Semesters?

Senior Capstone Final Report for Emalee Dunbar

Appendix III: Summary of Results

AUDUSD		Yearly	Quarterly	Monthly
Interest Rate	Average:	0.00549	0.02295	0.02765
Uncovered Interest Rate Parity	Average:	-0.03941	-0.02995	-0.01605
International Fisher Relation	Average:	-0.02001	-0.02663	
Relative PPP	Average:	-0.01940	-0.00333	
Forward Rates as Predictors	Average:	-0.03392	-0.00666	-0.00138

EURUSD		Yearly	Quarterly	Monthly
Interest Rate	Average:	0.00092	-0.00098	-0.00202
Uncovered Interest Rate Parity	Average:	-0.00186	-0.00103	0.00300
International Fisher Relation	Average:	-0.00153	-0.00027	0.00239
Relative PPP	Average:	0.00102	-0.00236	0.00045
Forward Rates as Predictors	Average:	-0.00074	0.00206	0.00095

Can Students Studying Abroad use Forward Exchange Rates as a Tool for Better Budgeting Their Semesters?

Senior Capstone Final Report for Emalee Dunbar

GBPUSD		Yearly	Quarterly	Monthly
Interest Rate	Average:	0.01622	0.00407	0.43825
Uncovered Interest Rate Parity	Average:	-0.00318	0.00379	-0.43893
International Fisher Relation	Average:	-0.0123	-0.00430	-0.43785
Relative PPP	Average:	0.00913	0.00421	0.00148
Forward Rates as Predictors	Average:	0.01364	0.00526	0.002484

USDCLP		Yearly	Quarterly	Monthly
Interest Rate	Average:	-0.01915	-0.00792	-0.01368
Uncovered Interest Rate Parity	Average:	0.04598	0.00927	0.01426
International Fisher Relation	Average:	0.03498	0.00984	0.01089
Relative PPP	Average:	-0.01628	0.00267	-0.00077
Forward Rates as Predictors	Average:	-0.00027	0.00212	0.00024

USDCNY		Yearly	Quarterly	Monthly
Interest Rate	Average:	-0.0277	-0.01571	-0.01539
Uncovered Interest Rate Parity	Average:	0.03938	0.01870	0.01682
International Fisher Relation	Average:	0.01419	0.00657	0.00740
Relative PPP	Average:	0.01553	0.01072	0.00726
Forward Rates as Predictors	Average:	-0.00853	0.00285	0.00103