

Instructions and Guide for Basis Swaps To Assess Borrowing Opportunities Lab

FINC413 Lab

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1 Introduction

1.1 Overview

In last lab, you explored the basics of swaps, focusing on two types: single currency plain vanilla interest rate swaps and cross currency basis swaps. From that lab, you have basic knowledge of swap pricing. You also should understand how the market value of the swap change as swap rate, spread, discount curve and so on change over time in the marketplace.

In this lab, you will focus on cross currency basis swap, and you will relate the swap spread (i.e., over foreign currency LIBOR) to your other finance knowledge. Think of yourself has being an international corporate with a borrowing need. Information from the swap market, along with your analysis, will enable you to compare borrowing opportunities among international markets, checking to see if there is a better borrowing deal for your company in one or another currency. You might find your company a comparative borrowing advantage in one of the markets over the others.

In addition, you will make comparisons across swap spreads in terms of term structures (term of the deal) and history (what are the trends). This will help you think about the underlying factors, and about what might come next.

The main activities in this lab guide are:

- Review of swap spread

- Analyzing a bar chart view of swap spreads
- Analyzing a term structure view of swap spreads
- Analysing a historical view of swap spreads
- Assess borrowing opportunities by using swap spreads

Remember, in this lab, swap spread usually refers to a cross-currency basis swap spread, i.e., the spread over foreign currency LIBOR paid by a counterparty in return for receiving home currency LIBOR.

1.2 Assignment details

As you work through these sections, be sure to prepare a detailed logbook for yourself to contain all the steps and results. Your logbook should be in a spiral bound or similar notebook, used only for purposes of our Labs. You will turn in your logbook after each Lab, and it will be returned to you after each Lab is graded.

You should make and save screenshots of some of the important Bloomberg screens you construct. (In the lab guide, there are tips for you to save the most important screens and you are expected save the minimum set of screenshots.) In your logbook, record the date/time and description (with the Bloomberg Mnemonic where feasible) of all Bloomberg screens used to obtain the specific numbers you rely on for each question below. This allows for your data to be checked later for the professor's auditing purposes and your review purposes.

When you are finished, use your logbook and the understanding you have developed to prepare a 6-8 page Lab Report for turn-in. Your lab report should carefully and professionally explain what you have done, what you have found, and what your work teaches you about finance. Your Lab Report should be numbered and keyed to the sections and specific items in this Lab Guide.

Your report should contain some Bloomberg graphics to help illustrate your points and show your completion of the lab items. These should be carefully labelled as numbered exhibits and should be placed in an Appendix at the end of your written report. Every Exhibit should be specifically discussed in the text of your report! Do not attach extra pages and pictures that you do not refer to in the body of your report, by specific exhibit number.

You may work through the lab with a partner, and you may turn in a single report for your partner team. Your Lab Report must be typed and carefully edited, and it should conform to professional standards for a business report.

A final note, about this Lab Guide. The Guide gives specific instructions on how to do the experiment, which have been tested on a Bloomberg terminal. Sometimes Bloomberg changes functionality, and the defaults and settings on your account may vary from the account used for testing. Thus, some flexibility and small adjustments on your part may be needed as you work through the Lab Guide.

2 Review of swap spread

1. *Command line.* Type SWPM and <Go> in command line.

Top. Click Products red button at the top of the screen, select Cross Currency Swaps in the drop-down list and select Cross Currency Swap (Float-Float) a the pop-up list. You will have a 5 year USD-EUR cross currency basis swap setting.

The term of maturity of the swap is 5 year, the Currency in Leg 1 is USD and Currency in Leg 2 is EUR, the Index in Leg 1 is US0003M and Index in Leg 2 is EUR003M. The setting for Reset Freq and Pay Freq should be all Quarterly, Day Count should be ACT/360 and Leverage is 1.00000 for both Leg 1 and Leg 2.

In Leg 2, on your right-hand side, at the right top of the screen, Spread indicates the difference between the floating rate the payer is obligated to make and the European forward rate.

- What is the Spread comes up on your screen in Leg 2? What does the spread suggest? (Hint: if you are in the zero-market value swap, and you have an US borrowing obligation, what is the underlying interest rate you can borrow in European market?)
- The indices used in SWPM (for instance, US 3M Libor), are the base rates used by banks to set their loan interest rates. What is the Latest Index in Leg 1?
- What is the Latest Index in Leg 2?

- What is the difference between Latest Index in Leg 1 and that in Leg 2? Is the difference the same as the Spread in Leg 2? Why? (Hint: think about the swap pricing formula and notice that both counterparties have the same credit ratings in Bloomberg settings. You do not need to write a long analysis article, but you might write down some of your thoughts and ideas in several short sentences)

3 Bar chart view of swap spread

1. In this section, you will explore and analyze the current and historical cross currency basis swap spread for a single currency in XCCY. The setting will be a 5 Year USD-EUR basis swap spread against the USD Libor rate.

Command Line. Type XCCY <Go> in the command line, click on Views on the top red tool bar and select Single-Currency Analysis.

Top. Select EUR as the currency to be analyzed in the Currency drop-down list at the top of the chart, check 5 Year as the tenor on the tenor checkboxes on the right of Currency, select USD Libor as the rate against in the Cross Currency Basis Swap Spreads Quoted vs drop-down list.

Right Top. In addition, select 5 Year as the Term at the right top of the screen yellow box as the term of maturity of the spreads showed in the right-hand side column, and choose Bid as the price type used in the Side yellow box right above Term setting.

- On the screen will come up the overall view of historical 5-year USD-EUR basis swap spreads against the USD Libor rate. How much is the spread level today? Is it same as the spread we have calculated in SWPM for the USD-EUR 5 Year cross currency basis swap, considering that the time is a little later? If it is not, why is that?
 - How much is the spread 1 week ago? What about 1 month, 2 month, 3 month, 6 month and 1 year ago? Briefly describe the trend and answer when is it highest and when is it lowest.
2. In this section, you will explore the swap spreads for a single currency of a variety of terms of maturity. Check the boxes at the top of the screens or

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1 Year, 3 Year and 10 Year and remain other settings unchanged. You will have the chart of current and historical 1 Year, 3 Year, 5 Year and 10 Year USD-EUR basis swap spreads on the screen.

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- What trend does the spreads in each group, i.e. in each period of time, show? Are these trends the same? What might, in your best guess, cause the difference in the trends?

3. In this section, you will compare the swap spreads for a variety of currencies and terms of maturity. Select Multi-Currency Analysis on the Views drop-down list. On the screen will display the cross currency basis spreads for multiple currencies specified on the right-hand size column. In this item, you should select AUD, CAD, CHF, EUR, GBP, JPY and RUB. Check the boxes at the top of the screen for 1 Year, 3 Year and 10 Year, and you will be access to the chart of multiple terms of maturity swap spreads. Each currency is displayed in an individual group on the screen and terms of maturity are labelled in different colors in the group.

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- Compare among the currencies and within each currency groups. What trend does the swap spreads show? Do the swap spreads for the seven currencies show the same trend? What might, in your best guess, cause the difference in the trends?

4. The swap gives you the information about interest rates in US and in foreign market. In the next two items, you should think about the borrowing opportunities. Go back to SWPM. If you can borrow at the interest rate specified in the swap, i.e. the foreign floating interest rate plus the spread, it might seem to be an especially good deal (or, alternatively, an especially bad deal) for your borrowing.

- For example, what if the pay rate on the euro leg of the swap is lower than the pay rate on the dollar side of the swap? It seems cheaper to borrow in euros. However, the swap might not be a good deal, if you take the possibility of future interest rate or the foreign exchange rate risk into your consideration. If the euribor goes sharply upward, you would be paying a lot more interests on the euro bond later. When there is a steep euro curve, later euro interest rate increases. On the other hand, if EUR depreciates, the EUR interest payments will not be as valuable in the future as they are now; if EUR appreciates, then it costs you more to make the EUR interest payments. (You should be able to see that

if the dollar pay rate is lower, the same argument works in the opposite direction.)

- Suppose that you can borrow at the US interest rate, and the swap offers you opportunity to borrow in the European market at an interest rate plus a negative spread. If the European borrowing cost (European interest rate plus a negative spread) is lower than the interest rate in the US market, do you think the euro might be expected to depreciate in the future, just based on thinking about the interest rates in the swap? (Hint: Think about foreign exchange rate and the zero NPV of the swap at inception from the previous lab guide. You do not need to write a long analysis, but express that logic briefly.)
 - Alternatively, what pattern of rates in the swap would lead you to think the euro might be expected to appreciate? Why?
 - Notice that, sometimes the 3M euribor plus the spread is lower than zero. That means you are being paid to borrow in the European market and receiving dollars from the US market. Why is that?
5. *Command Line.* Type FXC and <Go> in the command line and you will enter the Currency Rates Matrix.

Left. Hit Spot tab on the left of the screen to see the current foreign exchange rates for the currencies.

You should use BGN as the Source and select Last Price on the right of the yellow box. You should select in the Basket drop-down list at the top of the screen for Majors, and you will have the currency you do analysis for the borrowing opportunity.

The last row in the second column gives you the EURUSD exchange rate. For example, if the number in the cell is 1.3441, it means that 1 euro has equal value to 1.3441 US dollars. A US company can exchange 1.3441 US dollars it earns for 1 euro.

Middle. Choose the Forward tab in the middle of the screen to see the forward foreign exchange rates for the currencies. At the right top of the screen, you should select 1 Year as the tenor of the rate. You should read the number in

the specified cell, and think about the effect of foreign exchange risk on the value of the swap.

- What is the current EURUSD exchange rate?
- What is the 1 Year forward EURUSD exchange rate?
- Given the unbiased hypothesis, the forward exchange rate is the unbiased prediction of spot exchange rate in the future. Thus the 1 Year forward EURUSD exchange rate is the predictor of EURUSD exchange rate 1 year from now. Based on the hypothesis, how much will EURUSD exchange rate change in 1 year? Does it increase or decrease? Will EUR depreciate or appreciate, according to the change in EURUSD exchange rate? Next you will use the information from FXC about spot and forward rates to think about the question of “good deals” in borrowing.
- Suppose that you can borrow at rates that you saw in the basis swap market (i.e. on the SWPM screen of USD-EUR basis swap, you can type SWPM to go back to the SWPM screen). Which borrowing rate (in USD or in EUR) might seem to be a good deal ignoring any worries about currency appreciation/depreciation (focus on the European and US borrowing costs showed on the previous SWPM screen)?
- Which currency might be expected to appreciate based on the zero-NPV at-inception idea about swaps?
- Which currency might be expected to appreciate based on the FXC information?
- Does the assessment from the question just above match to the assessment of the question before that one? If not, why do you think it could be (notice that the numbers on the Latest Index on the SWPM screen are just indicators of the current interest rates)?
- Now, all things considered, if you could borrow at the rates in the swaps, do you still think one or the other might offer a good deal? Why or why not?

4 Term structure view of swap spread

1. In this section, you will explore and analyze the term structures of cross currency basis swap spread for a single currency.

Command Line. Go back to XCCY by typing XCCY <Go> in the command line.

Top. Select Single-Currency Analysis in the Views drop-down list at the top to make a single currency setting and at the bottom of the screen, you should click on the Historical Term Structure View tab to display the term structure curves.

You should select EUR as the Currency, USD Libor as the quoted rate and Bid as Side in the yellow boxes at the top of the screen.

Right. On the right-hand side column, you can specify the period of time for your term structure curves. In this item, you should check all the boxes in the column: Today, 1 Week, 1 Month, 2 Month, 3 Month, 6 Month and 1 Year.

- What trends do the term structure curves show? Do they always increase, as the terms of maturity increase?
 - Are the spreads in the most recent months at the same level? Are the spreads in recent months almost at the same level as the spreads one year ago?
 - What is the difference between the Term Structure View and the Summary View for single currency? Which view helps you most when you are comparing the spreads across time? What if you want to show your boss or your clients the changes in spreads of swaps of a certain term of maturity?
2. In this item, you will explore and analyze the term structures of cross currency basis swap spread for a variety of currencies.

You should select Multi-Currency Analysis in the Views drop-down list, hit Term Structure View at the bottom of the screen and check AUD, EUR and GBP on the right-hand side column.

Other settings should be the same as those for single currency swap spreads and you should select USD Libor as the quoted rate, Bid as Side and 5 Year as Term in the yellow boxes at the top of the screen.

- What are the spreads for 1Y, 5Y, 10Y and 20Y cross currency basis swaps in your specified currencies?

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- What are the trends for the term structure curves? Do they show the same trend? Do they always go upwards? For what term of maturity do the curves reach the highest spreads and the lowest spreads, respectively?
 - What is the difference between the Term Structure View and the Summary View for multiple currencies? Which screen helps you most if you are comparing different currencies of the same term of maturity?
3. The term structure gives you the cross currency basis swap spreads in a variety of terms for your specified currencies. In this item, you will focus on the “term structure curve” of USD-EUR basis cross currency swap spread and explore its relationships to foreign exchange risk and interest rate risk.
- According to the term structure curve of USD-EUR cross currency basis swap spread, what is the 1 Year USD-EUR cross currency basis swap spread? What is the 5 Year USD-EUR cross currency basis swap spread?
 - What does the difference between the 1 Year and 5 Year USD-EUR cross currency basis swap spreads might suggest for USD/EUR exchange rate? How do you predict the change in EURUSD exchange rate, from 1 Year from now to 5 Year from now?
 - What does the difference between the 1 Year and 5 Year USD-EUR cross currency basis swap spreads might suggest for European interest rate? Which one is more likely to happen, the European interest rate increases, or the European interest rate decreases, in the period?

5 Historical view of swap spread

1. In the section, you will explore the historical data for cross currency basis swap spreads for EUR.

Select Single-Currency Analysis in the Views drop-down list and click the Historical Spread View tap at the bottom of the chart.

You can specify the terms of maturity on the right-hand side column and in this item you should check 1 Year, 3 Year, 5 Year and 10 Year. At the top of the screen, you should use 1 Year as the Period, EUR as the Currency and at the right top of the screen, you should use Bid as the Side for the spreads. You

should also still use USD Libor as the rate quoted.

On the screen will display the historical data for the specified terms of maturity basis swap spreads.

- What are the trends for the spreads of swaps you specified?
- When are they highest and when are they lowest?

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2. In this item, you will have the historical spread view for cross currency basis swap spreads for a variety of currencies.

Select Multi-Currency Analysis in the Views drop-down list and click the Historical Spread View tap at the bottom of the chart.

You can specify the currencies showed in the chart and in this item you should check AUD, EUR and GBP. You should use a 5 Year term of maturity at the top yellow box and 1 Year as the Period on the left. Other settings remain unchanged.

- What are the trends for the spreads of swaps you specified?
- When are they highest and when are they lowest?

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3. The historical spread view shows you the historical line graph of 5 Year cross currency basis swap spreads for AUD, EUR and GBP, as you have specified in the previous item. In this item, you will compare the historical spreads for the three currencies.

- In the past 1 year, which currency has the highest spread on average, and which currency has the lowest spread as a whole?
- What might cause the difference between the highest spread and the lowest spread? How do they influence the spreads? (Hint: Think about the foreign exchange risk, interest rate risk and the idea of zero-NPV swaps at inception. You should write down your ideas as short answers)

6 Assess borrowing opportunities by swap

1. In this section, you will compare the borrowing opportunities between US market and overseas markets for an actual US borrower by using cross currency

basis swap information.

Command Line. Type SECF <Go> in the command line, and you will get access to the Security Finder function in Bloomberg.

Top. Click on the FI (Fixed Income) tab at the top of the screen and select Corp (Corporate Bonds) under the FI tap. On the screen shows the issuer name, coupon and currency for the corporate bonds.

You should specify the Issuer Name in the yellow box as General Electric, Coupon as Floating and Curr as USD.

The table will show you the USD yield for General Electric corporate floating-rate bonds for a variety of maturities. You should find the bond with approximately a 5 Year maturity and issued most recently. You should notice that Announce is the bond's issue date and Maturity is the bond's maturity date. For example, among the bonds displayed below, the second one and the sixth one have 5 year maturity, and the second one was issued in Jan 2014 while the sixth one was issued in Jun 2014. You should choose the sixth bond because it was issued more recently and thus reflects General Electric's most recent borrowing opportunity in US.

R	Issuer Name	Ticker	Bid Yield to Maturity	Coupon	Maturity	Series	BB Rtg	Mty Type	Announce	Curr	As
	GENERAL ELECTRIC*			Floating	4-7 Years					USD	
1	General Electric Capital Corp	GE	.640	FLOAT	06/11/2019	EMTN	AA-	BULLET	06/03/2014	USD	10
2	General Electric Capital Corp	GE	.820	FLOAT	03/28/2020		AA-	BULLET	03/27/2014	USD	99
3	General Electric Capital Corp	GE	.599	FLOAT	01/14/2019	GMTN	AA-	BULLET	01/08/2014	USD	10
4	General Electric Capital Corp	GE	1.018	FLOAT	04/15/2020	NOTZ	AA-	BULLET	04/01/2013	USD	10
5	General Electric Capital Corp	GE	1.064	FLOAT	12/28/2018	EMTN	AA-	BULLET	11/14/2006	USD	97
6	General Electric Capital Corp	GE	.884	FLOAT	08/07/2018	MTN	AA-	BULLET	07/28/2006	USD	98

Click on the bond, and select DES (Security Description) in the function panel.

- What is the current coupon rate of the bond? (The number after Coupon.) For a floating rate bond, this is also the yield to maturity (the coupon floats to market levels to keep the value of the bond at par.) What is the coupon rate “formula” shown on the DES screen? What is the spread



over LIBOR for the GE floating rate bond, according to the formula? (Hint: the definition of the spread of a floating rate bond is the difference between the reference rate, such as LIBOR, and the coupon rate)

- What is the S&P credit rating for the bond? Briefly explain the quality of the bond, according to the credit rating.
2. Go back to SECF, and try to find the EUR 5 Year floating General Electric corporate bond. You should use FI (Fixed Income) and Corp (Corporate Bonds) at the top of the screen, and type “General Electric” in the yellow box under Issuer Name. Specify Coupon as Floating but type in EUR in the Curr yellow box. Find the most appropriate bond in the table. Click on the bond and select DES.



- What is the coupon rate of the bond? What is the coupon rate estimation formula? What is the spread of the floating rate bond, according to the formula?
 - What is the S&P credit rating for the bond? Briefly explain the quality of the bond, according to the credit rating. Do the EUR bond differs from the USD bond in their qualities? How do the quality of the bonds influence their coupon rate? How do the investors in European market view GE’s bond?
 - What is the difference between the coupon rates of 5 Year floating General Electric corporate bonds in USD and in EUR, according to the coupon rate estimation formula? Which rate seems to be a good borrowing opportunity for GE, just based on the lowest interest rate?
3. In this item, you will combine what you have learned about the swap spread with the bond rate to assess the borrowing opportunities in US and overseas. Refer to the current 5 Year USD-EUR cross currency basis swap spread you have found in XCCY and assume that the swap market tells us what is a fair deal on comparing the USD and EUR rates.
- Which one will you find to be more worthwhile, as you have found in previous items, the USD 5 Year floating General Electric corporate bond or the EUR 5 Year floating General Electric corporate bond?
 - Suppose that General Electric issues an US 5 Year floating rate bond and enters into the USD-EUR cross currency basis swap to synthesis an European 5 Year floating rate bond, and General Electric can also borrow

directly in the European market by issuing an European 5 Year floating rate bond. Which borrowing is cheaper for General Electric? Is there really a good deal in one currency or the other? Explain why you say so.

- If you find a good deal in one currency (i.e., a lower rate either for borrowing in USD directly or a lower rate for borrowing in EUR and “swapping into” USD), do you think the opportunity is likely to last very long? Why or why not?
4. (Extra credit, not required) In this item, you will compare the fixed rate borrowing opportunities between US and oversea markets. Go back to SECF, and try to find a pair of corporate bonds that have the same term of maturity and were issued by the same company. The pair of bonds should be in USD and in EUR, respectively. Recall what you have learned about the plain vanilla swap, which exchange fixed rates for floating rates. Use plain vanilla swaps and cross currency basis swap, and try to assess the fixed rate borrowings in US and in European market.
- Can you spot any good deal? Explain how you can tell. You should think of linking together a USD plain vanilla swap to a USD-EUR basis swap to an EUR plain vanilla swap. Via this mechanism, you can swap fixed rate EUR borrowing into fixed rate USD borrowing.