Global Interest Rates Update

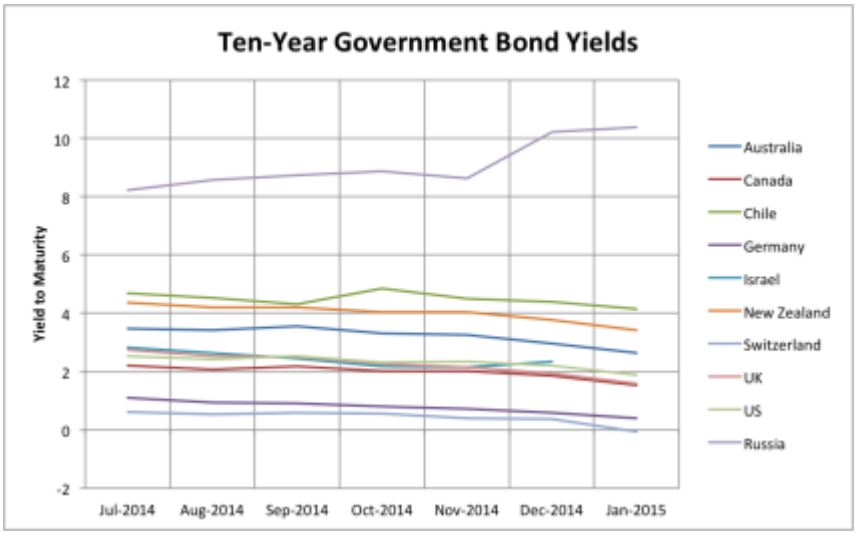
Late last year I wrote about **global interest rates**. I attempted to rationalize the **eye-popping disparity between U.S. and foreign government bond interest rates.** Today, doing some work for a class I'm teaching, I **once again noticed something pretty amazing. U.S. ten year notes have a yield of 2.017%. Germany and Japan are in the vicinity of 0.3%.** That will get anyone's attention.[1] **This is your global interest rate update**. As always, my methods are transparent. Click here to download the Excel workbook (includes both monthly and annual data).

Before proceeding with the update, **I must confess a minor error in my previous article**. **My equation for the default risk premium was much more complicated than necessary. I've corrected my mistake below.**

Data

So first **let's look at interest rate trends.** For some reason, Japan's data is only reported through October, 2014 in the OECD dataset. I'll exclude that country just to keep the data comparable by using a single source.

Here are **a few representative countries**. As always, the yield to maturity shown is on the ten-year government note. I assume (hope?) that OECD has corrected for coupon payments in putting these numbers together. This time **I have included only one eurozone country, Germany.**



Monthly Interest Rates, 2014 (click the image to enlarge)

Notice something very interesting. **The data falls into three rough groups**. (Russia, the top line, is a special case.) **The first group with interest rates around 4% includes Chile, New Zealand, and Australia**. It's fairly easy to understand why New Zealand and Australia might move together. A simple gravity model of trade will tell you these economies should be closely linked. But Chile? **Is there a strange southern hemisphere effect? The data is there – I leave it to more intrepid researchers to figure this out.**

The second group consists of Israel, the U.K., the U.S., and Canada. These four countries are linked by a shared language and historical ties. And, of course, the U.S. and Canada have both the gravity model and NAFTA to encourage economic linkages.

The lowest two countries are Germany and Switzerland. In fact, in January, 2015, the yield on Swiss government bonds was -0.07%. This is the nominal rate. Savers are paying the Swiss government for the privilege of lending it money.

Expected Future Exchange Rates

We can explain some of these interest rate differentials by using the uncovered interest parity (UIP) model: [2]

This equation simply says that **the yield to maturity on U.S. bonds should equal the yield on euro bonds plus the expected future depreciation of the dollar vis-à-vis the euro**.[3] When the dollar depreciates, one euro will buy more dollars. Thus a dollar depreciation increases the required return on U.S. securities, causing their interest rate to rise.

Here's the expected depreciation (+) or appreciation (-) of various currencies vis-à-vis the U.S. dollar. I've **excluded countries that did not have data for January, 2015**. Some of the depreciations are truly remarkable. Not surprisingly, **Russia is the leader in this group with expected annual depreciation of 23.85%. Iceland is also notable with 14.54% annual depreciation.**

Country	Expected depreciation (+) or appreciation (-) vis-à-vis the U.S. dollar	Expected depreciation (+) or appreciation (-) per year
Australia	76.00%	7.60%
Belgium	-113.00%	-11.30%
Canada	-35.43%	-3.54%
Chile	227.00%	8.54%
Finland	-126.00%	-12.60%
Germany	-149.00%	-14.90%
Hungary	130.00%	2.66%
Iceland	399.00%	14.84%
Italy	-17.79%	-1.78%
Netherlands	-136.00%	-13.60%
New Zealand	154.00%	4.41%
Norway	-43.00%	-4.30%
Poland	33.10%	3.31%
Spain	-33.60%	-3.36%
Sweden	-110.00%	-11.00%
Switzerland	-195.00%	-19.50%
United Kingdom	-29.10%	-2.91%
United States	0.00%	0.00%
Euro area (19 countries)	-61.01%	-6.10%
Russia	849.00%	23.85%

Expected Exchange Rate Changes

Currencies expected to appreciate sharply include the Swiss franc and the Swedish kronor. The eurozone countries are interesting: Belgium (–11.3%), Finland (–12.6%), Germany (–14.90%), the Netherlands (–13.60%) and Spain (–3.36%) all use the same currency. But the expected rates of depreciation are markedly different.

Default Risk

The only way to make sense of this is to introduce another variable: default risk. We can calculate the default risk premium as the difference between yields on government bonds issued by different governments but denominated in the same currency.

The usual explanations for interest rate differentials among various countries are (1) differential inflation rates and (2) expected future exchange rate changes. Naturally the two are related. However, expected future exchange rate changes also incorporate a variety of other risks, including exchange rate risk and default risk. The appropriate short-run model is a slight modification of UIP.

$$i_{€P} = i_{€G} + \frac{\left(E^{e}_{i_{€P}/i_{€G}} - E_{i_{€P}/i_{€G}}\right)}{E_{i_{€P}/i_{€G}}}$$

$$i_{€P} - i_{€G} = \frac{\left(E^{e}_{i_{€P}/i_{€G}} - E_{i_{€P}/i_{€G}}\right)}{E_{i_{€P}/i_{€G}}}$$

In this equation, $i_{€P}$ **is the yield on government securities for countries in the** ***P*** **group.**[4] Similarly, $i_{€G}$ **is the yield on German government securities.** In the eurozone, German government securities are the benchmark against which other countries are measured.

What, then, is the meaning of the expected change in the exchange rate, the term on the right side of the = sign? The Greek euro cannot depreciate against the German euro. In this case, we are measuring the *default risk premium* of the various countries.

To measure this I'll use **data from December, 2014 because all the eurozone countries have data reported for that month**. Also note that we apparently need to change the acronym. **Markets seem to think that Ireland has worked their problems out. But Slovenia is now in the mix. I propose PIGSS, mainly so I don't have to change a bunch of subscripts in this article.**

Country	Default Risk Premium
Austria	0.22
Belgium	0.41
Finland	0.30
France	0.44
Germany	0.00
Greece	**7.83**
Ireland	0.66
Italy	**1.40**
Luxembourg	0.06
Netherlands	0.19
Portugal	**2.22**
Slovak Republic	0.63
Slovenia	**1.52**
Spain	**1.20**

What's really interesting about this list is that **only Luxembourg approaches Germany's level of stability**. And **France's default risk premium is higher than you might expect for the second-largest economy in the eurozone.**

Conclusion

Wasn't that fun? **I hope you've learned a bit about using data to learn something interesting.**

[1] OECD (2014), "Finance", Main Economic Indicators (database). DOI: 10.1787/data-00043-en (Accessed on 27

February 2015)

[2] Material on UIP is based on chapter 4 from Robert C. Feenstra and Alan M. Taylor, *International Macroeconomics* (2012). Worth Publishers, New York. Disclaimer: I wrote the instructor's resource guide for this textbook.

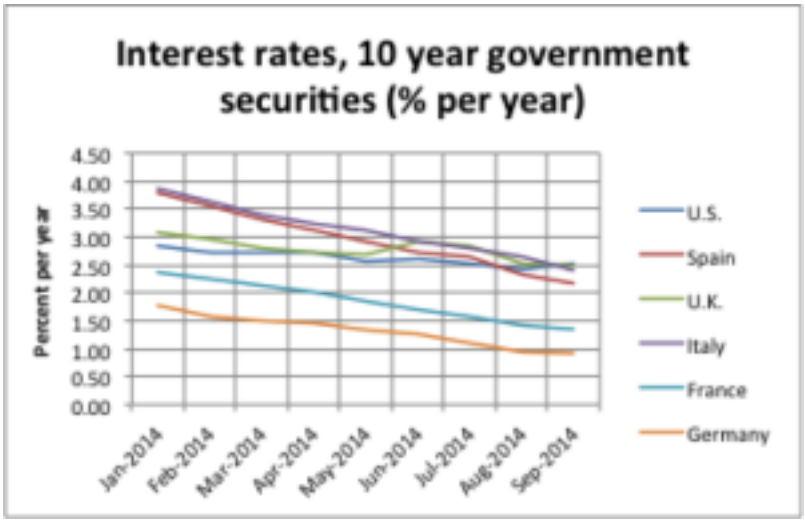
[3] It has become conventional to express exchange rates as units of home currency per unit of foreign currency. That means an increase in the exchange rate implies a depreciation of the home currency and vice-versa. This is only confusing the first 247 times you work with it. After that it's simple.

[4] *P* stands for PIIGS, the five countries in the eurozone that have very risky government debt.

Global Interest Rates

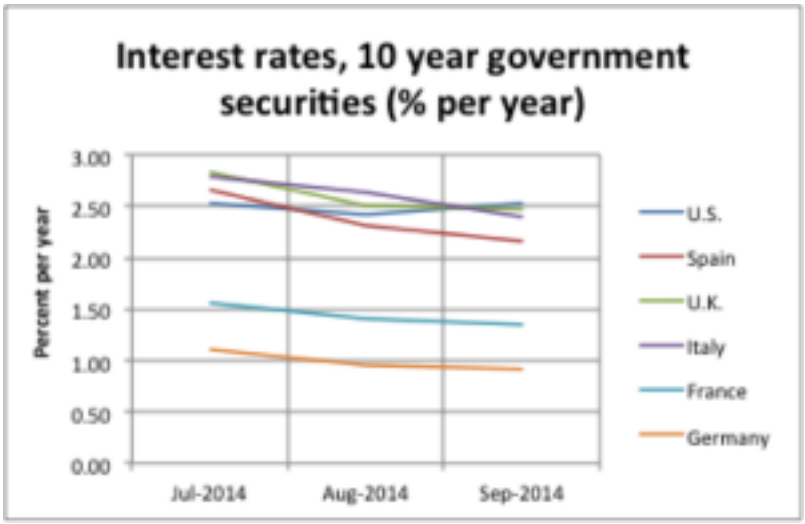
The other day, someone I regularly read on Twitter (@DividendMaster) noticed s**omething interesting about interest rates, specifically ten-year government notes in OECD countries.**[1] (As always, my methods are transparent. Click here to download the Excel workbook (includes both monthly and annual data).

Take a look at this and see if you notice **anything interesting:**



Monthly Interest Rates, 2014 (click the image to enlarge)

That's pretty hard to read. Here's a closeup of the last three months:



Interest Rates, Last Three Months (click for a larger image)

Yes, you're reading that right. **The U.S. interest rate was the highest among these six countries in September. Spain and Italy? Really? (If it's any relief, the interest rate on Greek sovereign debt was 5.89%, indicating that there is at least some sanity in the world.)**

Also note that **France and Germany are borrowing at interest rates considerably less than what the U.S. is paying.**

The usual explanations for interest rate differentials among

various countries are (1) differential inflation rates and (2) expected future exchange rate changes. Naturally the two are related. However, **expected future exchange rate changes also incorporate a variety of other risks, including exchange rate risk and default risk.**

Let's assume the risk of U.S. default is less than either Italy or Spain. We need a theory of expected future exchange rates. **The appropriate short-run model is *uncovered interest parity* (UIP).**[2]

Uncovered Interest Parity

UIP theory says **the interest rate**[3] **on comparable securities in two countries should be equal after adjusting for expected future exchange rate changes.**[4]

$$\underbrace{i_{\$}}_{\substack{\text{Interest rate}\\ \text{on dollar deposits}}} = \underbrace{i_{€}}_{\substack{\text{Interest rate}\\ \text{on euro deposits}}} + \underbrace{\frac{(E^{e}_{\$/€} - E_{\$/€})}{E_{\$/€}}}_{\substack{\text{Expected rate of depreciation}\\ \text{of the dollar}}} \qquad (4\text{-}1)$$

$$\text{Dollar rate of return on dollar deposits} = \text{Expected dollar rate of return on euro deposits}$$

Uncovered Interest Parity

Thus we see **the expected rate of depreciation of the dollar is equal to the interest rate differential. We can use this to construct the following table:**

Country	Sep-2014	Change vis-à-vis U.S.
France	1.3500	1.1800
Germany	0.9200	1.6100
Italy	2.4000	0.1300
Spain	2.1620	0.3680
United Kingdom	2.4753	0.0547
United States	2.5300	

UIP in Action

The markets are saying **the U.S. dollar is overvalued with respect to these currencies. The dollar is expected to depreciate vis-à-vis each of these countries.**

But there's still one problem. **All these countries except the U.K. and the U.S. use the euro. How can the dollar be expected to depreciate by different amounts against a single currency? It can't. There is only one spot U.S. dollar – euro exchange rate. The remaining differences must be due to default risk.**

Default Risk

Let's assume Germany's sovereign debt has about the same risk as U.S. government securities. We need to modify our UIP equation to account for default risk. The easiest way is to simply define the default risk premium as follows:

$$i_{\$} = i_{€G} + \frac{E^{e}_{\$/€G} - E_{\$/€G}}{E_{\$/€G}} + \frac{E^{e}_{\$/€O} - E_{\$/€O}}{E_{\$/€O}} + R_D$$

$$R_D = \left(i_{\$} - i_{€G} + \frac{E^{e}_{\$/€G} - E_{\$/€G}}{E_{\$/€G}} + \frac{E^{e}_{\$/€O} - E_{\$/€O}}{E_{\$/€O}} \right)$$

UIP With Default Risk

where the subscript *$/€G* refers to the expected depreciation of the dollar vis-à-vis the euro in Germany and *$/€O* is the apparent expected depreciation of the dollar vis-a-vis another Eurozone country. Thus we have the following premiums for the risk of default:

Country	Sep-2014	Change vis-à-vis U.S.	Default risk premium
France	1.3500	1.1800	0.4300
Germany	0.9200	1.6100	0.0000
Italy	2.4000	0.1300	1.4800
Spain	2.1620	0.3680	1.2420
United Kingdom	2.4753	0.0547	
United States	2.5300		

Default Risk Premiums

Conclusion

What's really interesting about this is that **Italy is viewed as higher risk than Spain. Default risks for other Eurozone countries are in the Excel workbook.**

[1] OECD (2014), "Finance", *Main Economic Indicators* (database). DOI: 10.1787/data-00043-en (Accessed on 21 December 2014)

[2] Material in this section is based on chapter 4 from Robert C. Feenstra and Alan M. Taylor, *International Macroeconomics* (2012). Worth Publishers, New York. Disclaimer: I wrote the instructor's resource guide for this textbook.

[3] "interest rate" means "yield to maturity" here and throughout.

[4] Feenstra & Taylor, p. 113.

Misunderstanding Default Risk

"In a sign of the fragile investor mood, gold surged to a new high of $1,628.30 a troy ounce. Investors also piled into Treasuries, driving down the yield on the benchmark 10-year

note sharply to 2.804%, its lowest close since last November. Yields, which fall as prices rise, cratered as investors searched for a safe haven ahead of the Aug. 2 debt-ceiling deadline."
– Wall Street Journal, July 29, 2011, "House Passes GOP Debt Plan" by Naftali Bendavi and Carol E. Lee (may be available at http://online.wsj.com/article_email/SB10001424053111904800304576475922394400688-lMyQjAxMTAxMDIwOTEyNDkyWj.html)

Huh??

This from the former "premier business daily" in the U.S. Students in my microeconomic principles class could figure out what's wrong here.

Hey, Wall Street Journal writers: who has to pay those Treasury notes? That's right, the U.S. government. Arguing that investors are buying those securities because they expect the U.S. government to default is, well, stupid.

The Murdochization of the Journal reaches yet another new low.

Financial Literacy Month

Sometimes they make my job too easy.

An April 4 joint press release by the Federal Reserve Bank of Chicago and Visa, Inc. trumpeted the main points made by speakers at the National Literacy Summit. Earlier – March 31, 6:52 pm, although delaying the announcement by six hours would have made more sense – President Obama announced that April was National Financial Literacy Month. My irony meter exploded.

This from the guy who gave us government budget deficits of

over $1 trillion. There is at least some evidence that global credit markets have added about 20 basis points to the yield on ten-year government bonds to reflect the increased default risk.