

## CASE STUDY 2: INSTRUCTIONS\*

- The solutions to the case study have to be submitted on WebCT by **9.00 AM on Tuesday 1<sup>st</sup> March 2011**.
- Late submissions CANNOT be accepted under ANY circumstance.
- Read the case study: “*Creative Balance Sheet Debt Management: Greek Swaps and Swaps à la Milanese*” and answer the questions below.

- **READINGS**

- Balzli, Beat, 02/08/2010. Greek Debt Crisis: How Goldman Sachs Helped Greece to Mask its True Debt. Spiegel.
- Dunbar, Nick. 01/07/2003. Revealed: Goldman Sachs’ Mega-Deal for Greece. Risk Magazine.
- Boland, V., Dinmore, G., Sanderson, R., Tett, G., 09/03/2010. An Exposed Position. Financial Times.
- Boland, V., 18/03/2010. Milan Swaps Case Puts Banks in Hot Seat. Financial Times.

- **QUESTIONS**

**PART 1. Why would a country issue debt denominated in a foreign currency?**

It is 1<sup>st</sup> May 1995 and Italy intends to raise ITL 1 billion through the issuance of a 3 years bond. The Italian Treasury can choose to issue debt denominated in either ITL or JPY. Assume that the JPY/ITL exchange rate (quote currency is ITL, base currency is JPY) is 20 and that the term structures of (continuously compounded) interest rates in Italy and Japan are described by the following table:

Maturities (years)	0.5	1	1.5	2	2.5	3
Italy	0.10	0.105	0.11	0.112	0.113	0.12
Japan	0.011	0.013	0.013	0.015	0.02	0.022

- a. If the Treasury intends to sell ITL denominated bonds at par, what is the annual coupon rate (semi-annual coupons, to be paid on 30<sup>th</sup> April and 31<sup>st</sup> October each

- year) it has to offer? Assume that the face value of one bond equals 100 and ignore day counting issues.
- b. Which amount does the Treasury have to raise in JPY?
  - c. If the Treasury intends to sell JPY denominated bonds at par, what is the annual coupon rate (semi-annual coupons, to be paid on 30<sup>th</sup> April and 31<sup>st</sup> October each year) it has to offer? Assume that the face value of one bond equals 100 and ignore day counting issues.
  - d. Under which conditions is the JPY issuance leading to lower financing costs?
  - e. Plot the ITL value of JPY coupons and of ITL coupons as a function of exchange rates on one graph, and the ITL value of JPY face value and of ITL face value as a function of exchange rates on another graph. Use the following range for the exchange rate: [15.5, 24.5] (current spot +/- approx 3 times the standard deviation of the JPY/ITL exchange rate between 1<sup>st</sup> May 1994 and 1<sup>st</sup> May 1995). Comment on the benefits and disadvantages of issuing JPY denominated vs ITL denominated bonds.
  - f. Suppose the government issues a JPY denominated bond and hedges completely against currency risk by trading in forward contracts. Derive the term structure of forward exchange rates. Will it secure cheaper financing by employing this strategy? Hint: compare IRR from ITL denominated issuance with the IRR on the ITL cash flows deriving from a fully hedged JPY denominated issuance.
  - g. In the light of the answers to the questions above, what can you conclude about the gains deriving from issuances denominated in currencies with lower interest rates? Explain.

## **PART 2. What happens when FOREX markets move?**

The head of the public debt division finally decides to opt for a JPY denominated issuance, and decides to ignore her advisor's recommendation to hedge currency exposure via forward contracts. It is now 1<sup>st</sup> November 1996 and the loan is due to expire in 1 year and 6 months. The JPY/ITL exchange rate has fallen at a steady rate and is now at 13.3. The term structures of interest rates have not changed in either country.

- a. What are the fair price, principal and coupon payments of the JPY denominated bonds as of 1<sup>st</sup> November 1996, in both JPY and ITL terms?
- b. Suppose that ITL denominated bonds had been issued on 1<sup>st</sup> May 1995. What would their fair price, principal and coupon payments be as of 1<sup>st</sup> November 1996?
- c. Compare answers a. and b. Was issuing JPY as opposed to ITL denominated bonds a good idea? Can the gains be lost? Discuss.

### **PART 3. Fixed-for-fixed currency swaps.**

Suppose that the government decides to enter a fixed-for-fixed currency swap on all outstanding debt on 1<sup>st</sup> November 1996.

- a. Why would the government do that?
- b. Assume that on 1<sup>st</sup> November 1996 the exchange rate is 13.3, and that the LIBOR rates coincide with the term structures used in part 1. Calculate the swap value by using the bond valuation approach. Hint: use the answers from previous question.
- c. What is the gain in ITL from issuance of JPY in the case that the government holds the swap until bond maturity?
- d. Assume now that the exchange rate that is employed is that prevailing on 1<sup>st</sup> May 1995 (JPY/ITL = 20), i.e. the swap is entered “off-market”. What is the value of the swap?

### **PART 4. Cross-currency swaps.**

On 1<sup>st</sup> November 1996 the government wishes to enter a cross-currency swap (careful: this is different from a standard currency swap).

- a. Describe the cash flows of a cross-currency swap from inception until maturity. What is the difference between currency swaps and cross-currency swaps?
- b. Why would Italy favour a cross-currency swap over a fixed-for-fixed currency swap?
- c. Comment on the effects of the swap transaction. What are the effects on the level of interest expenditure and of public debt before and after the maturity of the swap?

### **PART 5. Off-market cross-currency swaps and window-dressing.**

Suppose now that Italy decides to enter an “off-market currency swap”. In particular: the JPY/ITL exchange rate used to define the notionals is equal to 20 instead of the current spot (13.3), notionals are not exchanged at inception, but the swap rate is the same as on any zero-value swap (where the notionals are defined using market exchange rates).

- a. Describe the CFs involved in the transaction. Discuss why the swap should have non zero value at inception.
- b. Suppose that the bank proposes to offset the non zero value of the swap at inception by allowing Italy to make payments on the floating leg at a negative spread over Libor. Even though this is not standard practice, it can be conceptually viewed as an alternative to an upfront payment by the bank to Italy. Comment on the effects of this swap transaction, and make a comparison with those associated with a normal cross – currency swap.
- c. Comment on the effects on the level of interest expenditure and of public debt before and after the maturity of the swap