Appendix I: Definition of Reported Returns and Statistics

RETURNS

Where:
- Pb = beginning price
- Pe = ending price
- MVb = beginning market value (Pb+Ab)
- Ab = beginning accrued interest
- Ae = ending accrued interest

Monthly Price Return

Monthly price return = $(Pe - Pb) / MVb$.

Monthly Coupon Return

Monthly coupon return = $[(Ae - Ab) + \text{coupon payment}] / MVb$.

Monthly Total Return

Monthly total return = $[(Pe + Ae) - (Pb + Ab) + \text{coupon payment}] / MVb$

Where:
- SiB = beginning of period since inception total return
- SiE = end of period since inception total return

Periodic 3 Mnth

Rolling 3-month total returns = $\{[(100 + SiE) / (100 + SiB)] * 100\} - 100$

Periodic 6 Mnth

Rolling 6-month total returns = $\{[(100 + SiE) / (100 + SiB)] * 100\} - 100$

Since Inception Price

Cumulative price return since inception of the index.

Since Inception Coupon

Cumulative coupon return without reinvestment since inception.

Since Inception Cpn Rinv

Cumulative coupon return with reinvestment since inception = Incep Tot Rtrn – Incep Price.

Since Inception Total

Cumulative total return since inception.

STATISTICS

# of Issues   Number of issues in the index in that month.

Principal Amount   Outstanding par amount.

Market Value   Total par amount times price plus accrued interest.

Average Price   Par value-weighted price.

Average Coupon   Par value-weighted coupon.

Average Maturity   Market value-weighted maturity.

Average Yield   Market value-weighted yield to worst.

Average Duration   Market value-weighted modified-adj. duration or, for emerging-market bonds, blended Treasury duration.

Appendix II: Calculation of Total Returns

Calculating the since inception return for the current period

1. Add 100 to the monthly return (12/31/99) to determine the monthly index value.
2. Add 100 to the previous month's (11/30/99) since inception total return to determine the since inception index value.
3. Multiply the since inception index by the monthly index.
4. Divide by 100.
5. Subtract 100.

Global Aggregate Index for 12/31/99

100 + (-0.34)	=	99.66
100 + 114.29	=	214.29
214.20 x 99.66	=	21356.14
21356.14/100	=	213.56
213.56 – 100	=	113.56

Calculating a return over a specific time interval

1. Add 100 to the since inception return for the end date (12/31/99) to determine the ending index value.
2. Add 100 to the since inception return for the beginning date (12/31/98) to determine the beginning index value.
3. Divide the ending index by the beginning index.
4. Multiply by 100.
5. Subtract 100.

Global Aggregate Index for the calendar year 1999

100 + 113.56	=	213.56
100 + 125.21	=	225.21
213.56/225.21	=	0.9483
0.9483 x 100	=	94.83
94.83 – 100	=	-5.17

Annualizing a return

1. Add 100 to the since inception return to get index value for the end date (12/31/99)
2. Add 100 to the since inception return for beginning date (12/31/94)
3. Divide the end index by the beginning index.
4. Take the nth root (1/n power, n is the number of years) of the result
5. Subtract 1 and multiply by 100.

Global Aggregate Index five-year annualized return ending 12/31/99

100 + 113.56	=	213.56
100 + 52.02	=	152.02
213.56/152.02	=	1.4048
$1.4048^{1/5}$	=	1.07035
$(1.07035-1)*100$	=	7.035

Calculating coupon income return with reinvestment

$$CR = TR - PR - DR$$

where
TR = total return over the specified period (in percent)
PR = price return over the specified period (in percent)
OR = other return (pay down, currency return etc.)
CR = reinvested coupon income return over the specified period (in percent)

Global Aggregate Index for the calendar year 1999

$$1.07 = -5.17 - (-6.21) - (-0.03)$$

Calculating coupon income return without reinvestment

$$CI = (SICI\ (end) - SICI\ (beginning))/(100+SIPR\ (beginning))$$

where SICI (end) = since inception coupon income in percent at the end of the specified period (12/31/99)

SICI (beginning) = since inception coupon income in percent at the beginning of the specified period. (12/31/98)

SIPR (beginning) = since inception price return in percent at the beginning of the specified period. (12/31/98)

CI = nonreinvested coupon income return in percent over the specified period. (12/31/98–12/31/99)

Global Aggregate Index for the calendar year 1999

SICI (12/31/99) = 77.35
SICI (12/31/98) = 70.75
SIPR (12/31/98) = 15.80
(77.35 – 70.75)/(100 + 15.80) = 6.6/115.80 = 5.70%

Appendix III: Calculation of Hedged and Unhedged Returns

Unhedged Returns

Bonds are priced on the last business day of the month at the local market's close. The bonds are held the whole month and sold on the last business day of the following month at the local market's close.

The currency is converted to the local currency at the beginning of the month and then converted back to the base currency at the end of the month.

Price Return = (price ending – price beginning)/(price beginning + accrued interest beginning)

Coupon Return = (accrued interest end – accrued interest beginning + any coupon payment)/(price beginning + accrued interest beginning)

Local Return = price return + coupon return

Exchange Rate = Base Currency/Local Currency

Currency Return = % change in Spot * (1 + local return)

Example
Germany Government, 8.5% of 7/4/2027
Local Currency EUR, Base Currency US$

	Beginning 11/30/99	Ending 12/31/99
Price	108.983	106.726
Accrued Interest	2.664	3.214
Spot Rate (USD/EUR)	1.0069	1.0024
Price Return		-2.022
Coupon Return		0.493
Currency Return		-0.440
Unhedged Total Return		-1.969

[handwritten: } -1.524 = rtn₁]

[handwritten: Euro depreciates vs. dollar → rtn_US terms < rtn_local]

Implementation

Transaction 11/30/1999	U.S. Dollars	Euros	FX Rate (USD/EUR)	Comment
Opening balance	112.417			
Purchase Euros at spot	-112.417	111.647	1.006900	
Purchase bond		-111.647		Price + accrued = 108.983 + 2.664
12/31/1999				
Sell bond		109.940		Price + accrued = 106.726 + 3.214
Exchange proceeds at spot rate	110.204	-109.940	1.002400	
Closing balance	110.204			
Total Return (unhedged)	-1.969%			Closing bal/Opening bal – 1

Hedged Returns

Bonds are priced on the last business day of the month at the local market's close. At the end of the following month, the bond is sold at the local market's close.

Three currency exchange transactions are carried out. At the start of the month, currency is purchased at the spot rate to fund the bond purchase. Simultaneously, currency is sold one month forward at the prevailing rate. The amount sold forward is greater than the amount initially purchased, so as to hedge the expected return on the bond as well as the principal. The bond's expected local return is calculated based on yield (and should roughly equal the sum of returns due to coupon and accretion in an unchanged yield assumption).

At the end of the month, the bond is sold and the forward contract is closed. The residual amount of local currency not covered by the forward contract is exchanged to base currency at the then current spot exchange rate.

Price Return $=$ (price ending − price beginning)/(price beginning + accrued interest beginning)

Coupon Return $=$ (accrued interest end − accrued interest beginning + any coupon payment)/(price beginning + accrued interest beginning)

Local Return $=$ price return + coupon return

Exchange Rate $=$ base currency / local currency

Forward Rate $=$ Spot rate beginning * (1 + One Month Base Depo)/(1 + One Month Local Depo)

Relative Forward Rate Differential $=$ (Forward Rate − Spot Rate)/ Spot Rate

Expected Local Return $=$ (1 + Yield beginning/2)$^{(1/6)}$−1

Expected Currency Return $=$ Relative Forward Rate Differential * (1 + Expected Local Return)

Residual Currency Return $=$ (% change in spot)*(Local Return − Expected Local Return)

Currency Return $=$ Expected Currency Return + Residual Currency Return

Example

Germany Government, 6.5% of 7/4/2027
Local Currency EUR, Base Currency US$

	Beginning 11/30/99	Ending 12/31/99
Price	108.983	106.726
Accrued Interest	2.664	3.214
Spot Rate (USD/EUR)	1.006900	1.002400
1M USD Depo Rate	6.46%	
1M EUR Depo Rate	3.50%	
Forward Rate	1.009377	
Yield	5.751	5.904
Expected Local Return	0.474	
Price Return		-2.022
Coupon Return		0.493
Currency Return	(Expected 0.247 + Residual 0.009)	0.256
Hedged Total Return		-1.272

Implementation

Transaction	U.S. Dollars	Euros	FX Rate (USD/EUR)	Comment
11/30/1999				
Opening balance	112.417			
Purchase Euros at spot	-112.417	111.647	1.006900	
Purchase bond		-111.647		Price + accrued = 108.983 + 2.664
Sell Euros forward to cover current bond price plus expected return			1.009377	Amount to Hedge = 111.647 * (1 + 0.474%) = 112.176 Euros
12/31/1999				
Sell bond		109.940		Price + accrued = 106.726 + 3.214
Close forward contract	113.228	-112.176	1.009377	
Exchange remaining balance at spot rate	-2.241	2.236	1.002400	
Closing balance	110.987			
Total Return (hedged)	-1.272 %			Closing bal/Opening bal − 1

Unhedged Converted Returns

The returns of any Merrill Lynch Index can be re-based into any of 29 available currencies. The converted return is equal to the product of the local total return times the currency return. Currency return is equal to the ending FX rate (stated in terms of the number of units of the base currency per one unit of the currency of denomination of the bond) divided by the beginning FX rate.

$$CRR_n = \frac{FX_n}{FX_0} - 1$$

where:

CRR_n = currency return for period n

FX_n = end-of-period FX rate (stated in terms of the number of units of the base currency per one unit of the currency of denomination of the bond)

FX_0 = beginning-of-period FX rate (stated in terms of the number of units of the base currency per one unit of the currency of denomination of the bond)

$$TRR_{converted} = [(1 + TRR_{local}) \cdot (1 + CRR)] - 1$$

where:

$TRR_{converted}$ = total return of the bond converted into the base currency

TRR_{local} = local total return of the bond

CRR = currency return

Hedged Returns

Hedged returns are calculated on the basis of a rolling 1-month hedge. 1-month forward rates are purchased at the beginning of the month in an amount equal to the full value (including accrued interest) of the Index. Appreciation or depreciation in the value of the Index during the course of the month is left unhedged. The hedged return at the end of the month is equal to:

-   Local total return, plus

-   Currency return on unhedged local total returns, plus

-   Hedge return (forward return minus the currency return)

The hedged Index value can then be calculated by multiplying the prior month-end hedged Index value by one plus the hedged total return for the current month. Table 1 provides an example of the calculation of hedged return and hedged Index values for the Sterling Broad Market Index (UK00) hedged into US dollars for the month of July 2000.

To calculate intra-month returns and Index values, there is one additional component to be taken account of — the reversal of the 1-month forward position purchased at the beginning of the month. For example, to calculate returns and Index values as of July 14th, 17-day forwards (the number of days remaining in the month) are sold, reversing the 1-month forward position initially purchased on June 30th. Table 2 provides an example of the calculation of hedged return and hedged Index values for the Sterling Broad Market Index (UK00) hedged into US dollars for the period June 30, 2000 through July 14, 2000.

Merrill Lynch

Table 1: Hedged Return Calculation for the Sterling Broad Market Index Hedged Into USD (Jul-00)

Local Total Return	0.402%

GBP/USD FX Rates:

1-mo Forward Rate (30-Jun-00)	1.51483
Spot Currency Rate (30-Jun-00)	1.51350
Spot Currency Rate (31-Jul-00)	1.49740

Currency Return
$$= \text{(End Spot Rate / Begin Spot Rate)} - 1$$
$$= (1.4974 / 1.5135) - 1$$
$$= -1.064\%$$

Converted Return (Unhedged)
$$= [\,(1 + \text{Local Total Return}) * (1 + \text{Currency Return})\,] - 1$$
$$= [\,(1 + 0.00402) * (1 + -0.01064)\,] - 1$$
$$= -0.666\%$$

Currency Return on Unhedged Local Total Return
$$= \text{Currency Return} * (1 + \text{Local Total Return})$$
$$= -0.01064 \times (1 + 0.00402)$$
$$= -1.068\%$$

Forward Return
$$= \text{(Begin 1-mo Forward Rate/Begin Spot Rate)} - 1$$
$$= (1.51483 / 1.5135) - 1$$
$$= 0.088\%$$

Hedge Return
$$= \%\text{hedge} * (\text{Forward Return} - \text{Currency Return})$$
$$= 1.00 \times (0.00088 - -0.01064)$$
$$= 1.152\%$$

Converted Return (Hedged)
$$= \text{Local Total Return} + \text{Currency Return on Unhedged Local Total Return} + \text{Hedge Return}$$
$$= (0.00402) + (-0.01068) + (0.01152)$$
$$= 0.486\%$$

Hedged Index Value 31-Jul
$$= \text{Hedged Index Value 30-Jun} \times (1 + \text{MTD Hedged Return 31-Jul})$$
$$= 134.041 \times (1 + 0.00486)$$
$$= 134.692$$

Table 2: Hedged Return Calculation for the Sterling Broad Market Index Hedged Into USD (30-Jun-00 – 14-Jul-00)

Local Total Return	0.197%

GBP/USD FX Rates (see IND3)	
1-mo Forward Rate (30-Jun-00)	1.51483
Spot Currency Rate (30-Jun-00)	1.51350
Spot Currency Rate (14-Jul-00)	1.50140
15-day Forward rate (14-Jul-00)	1.50216

Currency Return
= (End Spot Rate / Begin Spot Rate) – 1
= (1.5014 / 1.5135) -1
= -0.799%

Converted Return (Unhedged)
= [(1 + Local Total Return) * (1 + Currency Return)] -1
= [(1 + 0.00197) * (1 + -0.00799)] – 1
= -0.604%

Currency Return on Unhedged Local Total Return
= Currency Return * (1 + Local Total Return)
= -0.00799 x (1 + 0.00197)
= -0.801%

Forward Return
= (Begin 1-mo Forward Rate / Begin Spot Rate) – 1
= (1.51483 / 1.5135) – 1
= 0.088%

Return on Reversal of Forward Position
= (Ending Spot Rate / Ending Forward Rate) – 1

= (1.5014 / 1.50216) – 1
= -0.051%

Hedge Return
= %hedge * (Return on Initial Fwd Position + Return on Reversal of Fwd Position – Currency Return)
= 1.00 x [(0.00088) + (-0.00051) – (-0.00799)]
= 0.837%

Converted Return (Hedged)
= Local Total Return + Currency Return on Unhedged Local Total Return + Hedge Return
= (0.00197) + (-0.00801) + (0.00837)
= 0.233%

Hedged Index Value 14-Jul
= Hedged Index Value 30-Jun x (1 + MTD Hedged Return 14-jul)
= 134.041 x [1 + (0.00233)]
= 134.353