

行政院及所屬各機關出國報告
(出國類別：研究)

研究可轉換公司債、資產交換
與利率訂定之操作實務

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出國期間：89.11.06~89.12.05
報告日期：90年3月5日

D3/
C09000354

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可轉換公司債、資產交換與利率訂定之操作實務

壹、任務範圍：

職獲派本行八十九年度因公派赴國外研習「可轉換公司債、資產交換與利率訂定之操作實務」，於八十九年十一月六日起至八十九年十二月五日，前往香港及新加坡金融機構，為期一個月。

此次研習的重點是以資本市場上的可轉換公司債為主軸，探討資產交換的可行性，並輔以新近國內企業—鴻海精密工業（股）公司在海外發行可轉換債券作一個實例分析。

由於股票市場的活絡，國內上市公司為籌措資金，委由投資銀行承銷可轉換公司債，多數銀行受邀參貸，使得銀行的融資決策由進出口融資、購買債券、商業本票及擔保放款等方式隨著債券市場發行工具的多樣化呈現有別於傳統的放款融資方式。

在國際金融交易市場商品中，愈來愈多銀行利用衍生性金融商品來規避風險，其中可轉換公司債的投資方式經由交易對手的重新包裝、股票市場的熱絡與發行條款多樣化，其商品在資本市場將會愈來愈多，本行承做的機會也會愈來愈大。

在此衷心感謝林經理清郎的鼓勵報考，並承蒙香港分行何經理鎰澄與新加坡分行張經理壽雄的悉心指導，陪同拜訪當地金融同業，更進一步了解國外金融機構對國際金融商品研究的專業化與專業知識的訓練。

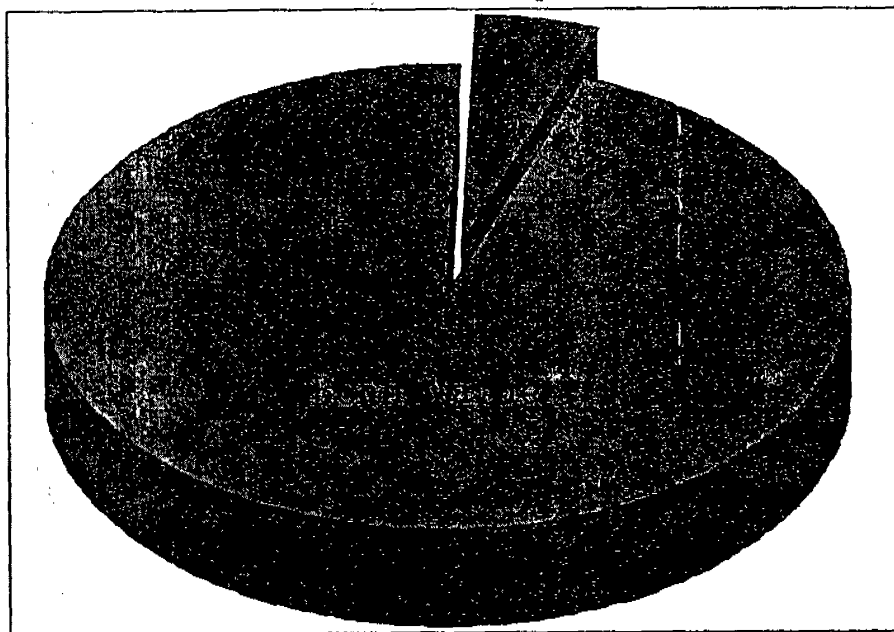
貳、可轉換公司債

一、定義

可轉換公司債為一混合式有價證券的金融商品，其性質包含公司債的部份與股票部份，可轉換公司債的性質在最初發行時無人能預知它最後會演變成何種交易工具，因為可轉換公司債內含的轉換權(Equity Option)將會決定投資人未來的行為，如果股價大幅上漲，投資人可以選擇執行所擁有的選擇權，將所有的可轉換公司債轉換成股票，如果股價漲幅不大或下跌，可轉換公司債投資人可以不執行選擇權，享有定期的票息收入，最後像普通一般的債券一樣贖回本金。(如下圖)

Convertible Bond = Bond + Equity Option

Equity
option



二、內容

(一) 債券部份

假設可轉換公司債持有人在債券到期前未執行轉換權，那持有人就像任何債券持有人一樣，可以定期收到固定票息及到期時的贖回款項，通常票息為每一年或每半年支付一次，假設債券持有人在可轉換公司債到期前均未執行轉換權，那麼這段期間的現金流量、市場利率與發行者在市場上的信用評估將可以用來決定可轉換公司債內含債券的真實價格 (pure bond value)。或者是債券價格的下限 (bond floor)，而該下限也就是當股價處於低點時，可轉換債券價格的最低點，這是可轉換債券本身所提供債券持有人的保障 (down side protection)。

(二) 股票部份

一般債券與可轉換公司債的差別在於可轉換公司債內含的股票轉換權利 (equity option)，經由購買可轉換債券，等於投資人購買一個權利資格，用一定債券面額轉換成發行者某特定數量的公司股票，這些特定數量的公司股票即所謂的轉換比率，是以債券的面值除以轉換價格，轉換價格通常在發行時以固定方式訂定並高於當日的標的股價，其超出部份市場謂之升水 (premium)。可轉換公司債內含的股票選擇權，當目前市場股票價格高於固定的轉換價格，那麼就有利於投資人將所持有的可轉換公司債轉換成股票，可轉換公司債的賣回條款 (put provisions) 大都為美式賣回權 (American put option)，只有少部份例外是歐式賣回權 (European put option)，美式賣回權的可轉換公司債賦予投資人更多的機會去執行股票轉換權，通常是發行日後一個月一直到到期日前一個月投資人都可以執行他的權利。

三、可轉換公司債的基本發行條款與評價

可轉換公司債的基本發行條款包括其債券內容、存續期間、轉換條件，除了某些例外情況外，大都固定不變。

通常在發行可轉換公司債時，其發行條款的設計可以為吸引某特定投資人而作規劃，例如低升水、低票息可吸引股票偏好較高的投資人，或是以高升水亦即高價格低限、高票息來吸引傳統上喜好固定收益的投資人。

股票偏好較高的投資人會加強評估可轉換債券內含的股票選擇權，而喜好固定利率收益的投資人則相反。因此將可轉換債券區分成兩部份將有利於投資人，這也是可轉換債券資產交換的重要設計。

以圖 1-1 說明股票偏好較高的投資人對可轉換債券的評價以及圖 1-2 說明固定利率收益的投資人對可轉換債券的評價。

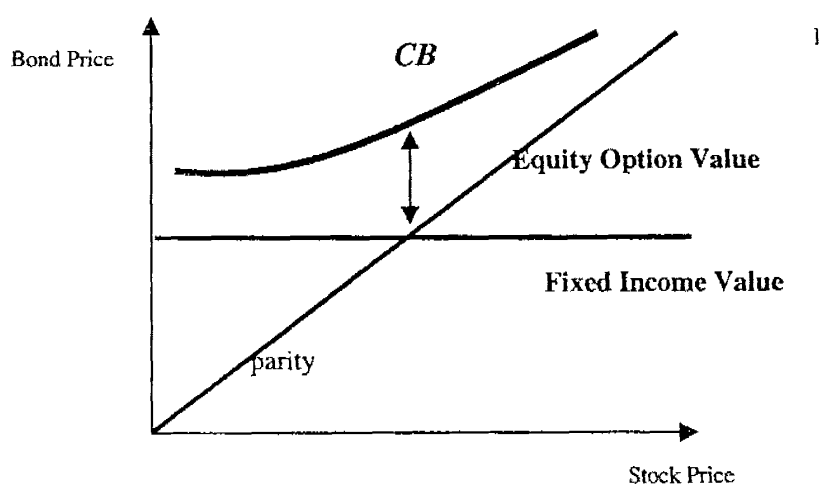


圖 1-1 股票偏好較高的投資人對可轉換債券的評價

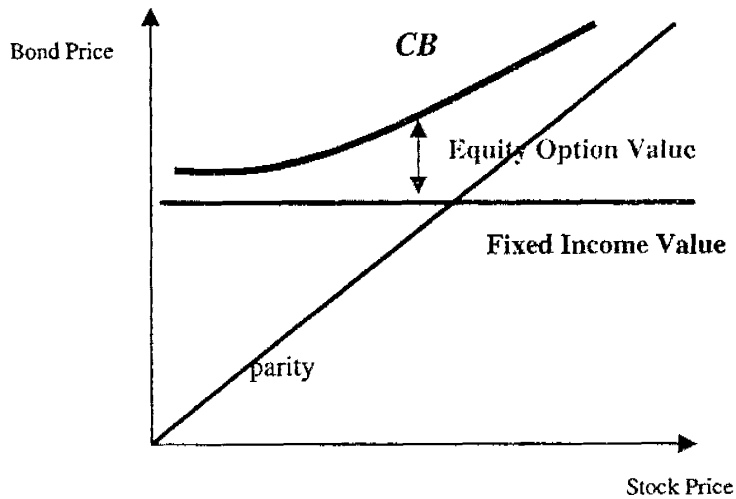


圖 1-2 固定利率收益的投資人對可轉換債券的評價

發行條款的固定不變，可方便投資人藉以計算可轉換公司債的衍生價值，例如轉換價格、不同幣別的固定轉換匯率、轉換比率的計算。

發行條款也包括息票發放的多寡、發放的期間、債券贖回金額、贖回日期、可贖回的條件限制以及何時開始贖回等。除此之外可轉換公司債在市場上的排名次序也可以由債券的基本發行條款一窺究竟。

以下附上已經在市場上流通的 Daimler Benz 公司以及 Nord Landesbank 公司所發行可轉換成 Deutsche Telecom 股票的可轉換公司債之基本發行條款以及市場上對該二種債券的評價。

Daimler 4.125% 07/2003 Convertible Bond		NLB/Deutsche Telecom 3%, 02/2003 Exchangeables	
Fixed Issuance Terms:		Fixed Issuance Terms:	
Issuer:	Daimler Benz.	Issuer:	Nord Landesbank Exchangeable into Deutsche Telecom Shares.
Coupon:	4.125%	Coupon:	3.00%
Coupon Freq.:	Quarterly	Coupon Freq.:	Annual
Maturity:	July 5, 2003	Maturity:	February 11, 2003
Issue Date:	June 13, 1996	Issue Date:	July 14, 1997
Issue Amount:	US\$750 mn	Issue Amount:	US\$150 mn
Issue Price:	97.5	Issue Price:	100
Face Value:	1000	Face Value:	10000
Conversion Price:	94.87	Conversion Price:	53.692
Conversion Ratio:	10.277	Conversion Ratio:	33.571
Fixed Forex Rate:	1	Fixed Forex Rate:	1.803
Bond Currency:	DEM	Bond Currency:	USD
Stock Currency:	DEM	Stock Currency:	DEM
Stock Ticker:	DAIG.IBS	Stock Ticker:	DTEG.IBS
Put Schedule:		Put Schedule:	
Put Date:	Not Applic.	Put Date:	Not Applic.
Put Price:	Not Applic.	Put Price:	Not Applic.
Call Schedule:		Call Schedule:	
Hard No Call Until:	July 5, 2000	Hard No Call Until:	May 11, 2000
Soft Call to July 5, 2003 at par		There after callable at par	
Trigger:	130%	Trigger:	None
Current Pricing (Feb 12, 1998):		Current Pricing (Feb 12, 1998):	
Offer Price:	145.25	Offer Price:	95.5
Parity:	133.29	Parity:	63.83
Prem./Disc. (%):	8.97%	Prem./Disc. (%):	49.61%
Stock Price:	129.7	Stock Price:	34.4
Actual Delta:	77.32%	Actual Delta:	36.23%
Implied Volatility:	28.02%	Implied Volatility:	28.09%
100-day Historic Volatility:	41.10%	100-day Historic Volatility:	29.49%
Pure Bond Value:	97.14	Pure Bond Value:	88.78
Rho:	-4.29	Rho:	-3.844
Assumed Spread:	30bp	Assumed Spread:	10bp
Running Yield:	2.84%	Running Yield:	3.14%
Dividend Yield:	1.27%	Dividend Yield:	1.74%
Yield to Maturity:	-3.48%	Yield to Maturity:	4.02%

上列左邊的基本發行條款是由 Daimler 公司所發行票息 4.125%，到期日 2003 年 7 月的可轉換公司債，該債券傾向於鼓勵投資人轉換成股票的債券，由於該債券是以轉換 Daimler 公司自家股票，因此並沒有匯率上轉換的風險。由 Daimler 公司所提供的固定條款與發行日的現行價格可以清楚看出該債券高票息與低升水的特性。

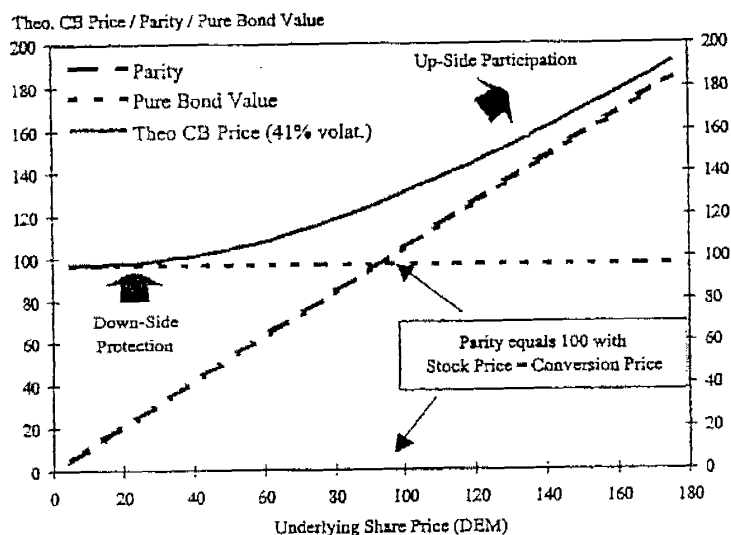
另一方面由 Nord Landesbank 所發行票息 3.00%，到期日 2003 年 2 月的可轉換債券是以轉換該公司所有的 Deutsche Telecom 的股票，而 Nord Landesbank 是該債券的當然保證人，因此對 Nord Landesbank 的信用評估成為投資該債券的主要一個關鍵，另外由於 Deutsche Telecom 是以美金計價，而 Nord Landesbank 的債券是以馬克計價，因此在轉換時會有匯率風險，為免除該風險得以固定匯率

定之。如右圖 Deutsche Telecom 債券發行條款中 Fixed Forex Rated 為 1.803。

四、可轉換公司債價格與股價的關係

可轉換公司債與標的股價之變動關係可以以下列圖形說明：

Figure 1
The Risk/Return Characteristics of Convertibles, Compared to Stocks, Limit the Downside Without Excluding the Investor from Upside Participation



Source: Morgan Stanley Dean Witter Research

上圖說明了某些投資人偏愛可轉換公司債的原因在於當股價走高時，可轉換公司債的價格會逐漸逼近平價線（Parity Line）。亦即當股價很高時，可轉換公司債的行為類似股票，幾乎可以完全享有股價上漲的效益。當股價下跌時，可轉換公司債的價格也會下跌，但下跌的速度相對緩和。

當股價偏低時，可轉換公司債價格將逐漸減緩到某一固定水準後不會再隨股價下跌而下跌。這是因為可轉換公司債具有債券的性質，在股價偏低時，投資人可以贖回債券的本金而不執行轉換權，所以當股價下跌時，債券的性質使

可轉換債券具有某種程度的保障，使其價格不會低於某個程度，這個限度就是所謂的「價格下限」。

所以投資人持有可轉換公司債可以享有股價上漲的利益，而不需暴露在股票下跌到某一定水準以下的風險。為取得這種利益，必須支付升水的代價，即上圖所示 CB 價格與平價線之間的距離。升水的價值取決於許多的因素，包括：標的股價、利率與債券存續期間。假設其他原因不變，股價越高，升水越小，股價越低，升水越大。但隨著時間經過可轉換公司債越接近到期日，嵌入選擇權的價值越來越小，升水也逐漸逼近於零。為瞭解可轉換公司債在市場上的實務操作，首先必須說明可轉換公司債價格決定因素與其間的關係。

五、可轉換公司債價格與股票價格波動率的關係

價格波動率是決定股票買進選擇權的價格的變數之一，可轉換公司債的價格同時受到根本股票的價格波動率的影響。在金融市場上，價格波動率敏感性衡量值 vega 定義為價格波動率變動 1 個百分點所造成的可轉換公司債價格變動量。

假設 ABC 公司所發行的可轉換公司債還有一年到期，如果價格波動率為 15%，市場利率 5%，該公司標的股價為 80 元，則可轉換公司債的理論價值為 82.984 元。假設將價格波動率設定為 16%，而可轉換公司債的價格增加為 83.278 元，則可轉換公司債在該標的股價 vega 值為每股 0.294 元。

在實務上我們可以發現價格波動率愈高，可轉換債券的價格也愈高。這是因為標的股價的價格波動率愈高，股價愈可能高過轉換價格，所以可轉換債券轉換為股票的權利愈有價值。所以價格波動率會在轉換價格附近形成最大差異。

假設今天有兩個完全對等的可轉換債券，契約期間一年，其唯一的差別在於根本股票價格波動率，兩者間的價格差異在於標的股價接近轉換價格附近時

最為明顯，隨著標的股價逐漸遠離轉換價格，二個可轉換債券的價格差異逐漸縮小。

六、可轉換公司債價格與利率水準的關係

一般債券的價格為未來所有現金流量的現值之總和，所謂「未來所有現金流量」是指債券在存續期間所產生的利息與到期一次給付的本金，將現金流量折現時所使用的折現率為債券殖利率，不同時點的現金流量應適用不同的折現率，折現率愈低，債券價格愈高，債券價格與殖利率呈反向變動。在可轉換公司債的情況下，由於其內含的「股票選擇權」使得其與利率之間的關係在某些情況下不具有直接影響。

假定股票價格波動率固定不變，股價愈低，利率對可轉換公司債的影響愈大；假設債券在到期日時的標的股價低於轉換價格，可轉換公司債的投資人將會贖回本金，亦即可轉換公司債的投資人實際上是持有一個固定收益的證券，因此該可轉換公司債的價格會像一般標準債券一樣受到利率變動的影響，假設其他因素不變的情況下，可轉換公司債的價格與利率水準呈反向變動關係。亦即股價遠低於轉換價格，可轉換公司債持有人僅暴露在利率風險之中。

反之，當股價愈高，利率對可轉換公司債的影響愈小，可轉換公司債的價格就像股票一樣，幾乎不受利率變動影響。可轉換公司債持有人暴露在股票價格變動的風險之中。當股價很低，可轉換公司債就像標準債券一樣對利率變動很敏感。

因此我們可以得知當股價夠高，即使利率水準增加，可轉換公司債的價格受利率的影響相對而言不大，如果股價夠低，可轉換公司債的價格對於股價變動的反應相對遲鈍，但對於利率變動卻很敏感，由股票狀態演變成債券狀態。

七、提前贖回條款對可轉換公司債的影響

幾乎所有的可轉換公司債都附有“提前贖回條款”(call provisions)，亦即發行者有權根據預先設定的價格提早贖回債券，發行者做提前贖回條款之意思表示時，通常是希望可轉換公司債持有人能進行轉換。

由於提前贖回條款(call provisions)通常是不利於投資人而且是屬於發行者的選擇，所以大多數的提前贖回權利都會受到一些條件的限制，最常見的限制條件是限制發行公司不得在特定日期之前贖回債券，另一個常見的限制條件是在公司股價上漲超過轉換債券價格特定比例或達到特定價格前，不得行使提前贖回權利。

例如鴻海精密工業(股)公司在 2000 年 11 月 15 日發行的可轉換公司債其提前贖回條款為：

1. STOCK PRICE MUST EQUAL OR EXCEED TWN 361.6200

2. DATE PRICE

11/15/03 100

鴻海公司在 2003 年 11 月 15 日或鴻海股價超過或相等於 361.62 元之前不得提前贖回可轉換公司債。

在 2000 年 11 月 15 日到 2003 年 11 月 15 日的這段期間無論股價如何變動，可轉換公司債都不可以提前贖回，這可以使得投資人得到某種程度的保障，這段期間在市場上謂之「hard non-call period」—不得贖回期間。

在鴻海股價超過或相等於 361.62 元之前不得提前贖回可轉換公司債，那麼附屬在可轉換公司債內的股票選擇權才會存在其價值。因為如果沒有這個限制條件，發行者可以在可轉換公司債價格稍微上漲時就贖回可轉換公司債，那麼就投資人來說是很不公平的。

所以當可轉換公司債符合提前贖回條款時，可轉換公司債的升水(premium)價值就會不存在而等於零。

所以提前贖回條款一定會影響可轉換債券的價格,也會影響可轉換公司債的壽命,因為當投資人買進可轉換公司債時由於有「hard non-call period」的保障期間,在該期間內提供投資人股票價格波動操作。這也是投資人願意付出高於標的股價的轉換價值來購買可轉換公司債的原因。

提前贖回條款對於可轉換公司債價格的影響會隨著標的股價的變動而變動,以鴻海公司為例,當股價極低時,可轉換公司債價格會接近債券價格下限,在這個時候股價上漲到超過 361.62 元的機率很低,所以提前贖回條款不可能會被發行者加以運用,可轉換公司債價格也就不會受到影響。另一方面,如果標的股價極高時,可轉換公司債價格原本就會接近平價線,因此也不會有太大的影響。只有在可轉換公司債價值稍有升水且不在不可贖回期間,提前贖回條款才會成為真正的威脅。

八、提前賣出債券選擇權對可轉換公司債的影響

某些可轉換公司債附有提前賣出選擇權(put provisions),亦即可轉換債券的投資人有權利強迫發行者根據約定價格將債券買回,提前贖回投資人的本金。這是一個有利於投資人的權利,因此會增加可轉換公司債的價格,例如鴻海精密工業(股)公司的可轉換公司債券所附上的贖回條款為發行日後每一年的 11 月 15 日直到西元 2003 年,在這段期間的每年 11 月 15 日投資人都可以申請提前賣出該筆可轉換公司債。

由於投資人可以執行賣出選擇權迫使發行者提前買回可轉換債券,當股價偏低時,投資人愈有可能執行賣出選擇權,提前贖回本金。這是因為資金本身具有時間價值,所以股價偏低時,賣出債券選擇權(put provision)的影響力最大。

賣出債券選擇權對於可轉換公司債價值的影響力也會受到股票價格波動率、市場利率與附息債券利息的多寡影響。債券利息愈高,賣出債券選擇權愈

沒有價值，因為一旦選擇執行該項權利，就要放棄高利息所得，所以賣出債券選擇權的價值與利息高低成反向影響。相同地，當市場利率愈高，折現率愈低，賣出債券選擇權愈沒有價值。

參、資產交換(Asset Swap)

一、定義：

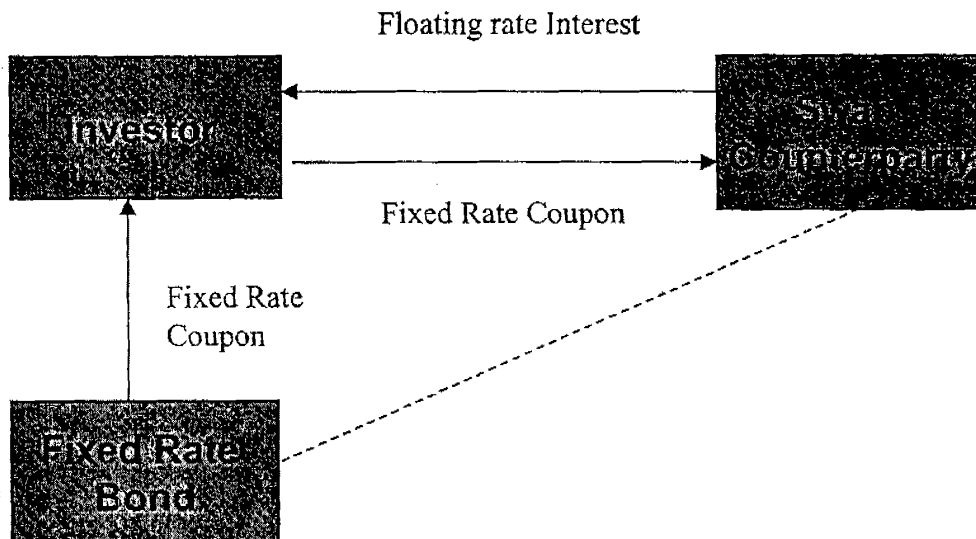
交換是以物易物的交易行為，自遠古以來即存在於人類社會之中，近年來市場匯率波動及利率制度的改變，造成國際金融市場上價格的不穩定，對投資人產生極大的風險。為規避匯率及利率等不確定因素的價格風險，衍生性金融商品應運而生，在衍生性金融商品的種類中—交換契約 (Swap Contract)，由於其避險功能較大，信用風險較低，因而廣泛運用在金融商品交易中。

"交換"就其字面解釋係指交易雙方在一定條件下將自有的資產或負債與對手進行交換，亦即指參與交易的雙方在未來一定期間內作定期交付款項的交換行為，不論市場價格的變化如何，其所承受的風險將因而降低，由於金融交換的避險功能，儼然成為金融機構投資策略的避險工具之一。

資產交換交易是交換契約的類型之一，結合了具有固定利率收益的有價證券與避險合約例如交換 (Swaps) 或選擇權 (Options) 與他方進行交易，如下圖所示投資人購買一個固定利率收益的債券，為避免債券存續期間的利率風險，故與交易對手進行利率交換 (Interest Rate Swap, IRS)，將債券未來所產生的固定利率收益 (Fixed Rate Income) 與交易對手換取浮動利率收益 (Libor + Spread)。

二、圖形：

$$\text{Asset Swap} = \text{Fixed Rate Bond} + \text{IRS}$$



三、交易方式：

大部分的資產交換是以"par/par"的方式進行交易，"par/par"是指投資人不管標的債券在市面上實際價格如何，即使贖回價格高過市價，投資人仍以債券贖回價格購買標的債券，並在該債券存續期間收到相等於當初購買價格的 Libor + Spread。理論上而言，交易雙方的淨現金流量的價值必須相等。雙方才願意進行交換交易。

另外資產交換也有 Discount Swap/Back-end Swap 的方式，在 Discount Swap

的情況下，投資人以市場價格或是債券名義價格向 Swap Dealer 購買標的債券。在該債券存續期間，投資人付給 Swap Dealer 債券票息並收取 Swap Dealer 所給付的 Libor + Spread，一直到債券到期，投資人一次將差價完全補償給 Swap Dealer。

這二種資產交換方式最大的不同在於現金流出流入的金額，若債券發行人在債券存續期間無法付出票息而毀約時，投資人不管是用何種方式交易，其最大的損失是該債券在執行資產交換的市場價值。舉例說明投資人在發行者毀約時所承受的風險：

1. 發行者：ABC 公司
2. 發行標的：ABC 公司可轉換公司債付息 3% 2003 年到期
3. 期間：3 年
4. 票息：年利率 3%
5. 贖回價格：130%
6. 可轉換公司債的市場價值：100%
7. 市場利率：10%（假設在債券存續期間市場利率都維持在該水準）
8. 股票選擇權：10%（假設可轉換公司債內含的股票選擇權價值為名義本金的 10%）
9. 金額：USD1,000,000.00

以 Discount Basis 方式交易的資產交換 Spread 為 Libor+608bp

以 Par/Par Basis 方式交易的資產交換 Spread 為 Libor+468bp

假設投資人在執行資產交換的第一天，發行者就無法履行契約，此時投資人所承受的風險以下列表格不同交易方式說明之：

(1) Par/Par 交易方式：

Loss on Par-Par basis in case of *default* by the Issuer

Par-Par Basis	0 Yr	1 Yr	2 Yr	3 Yr	
DF	1.0000	1.1000	1.2100	1.3310	Total
Cash Outflow	130%	3%	3%	3%	
	(1,300,000)	(30,000)	(30,000)	(30,000)	(1,390,000)
PV	(1,300,000)	(27,273)	(24,793)	(22,539)	(1,374,606)
Cash Inflow		L + 468bps	L + 468bps	L + 468bps	
	0	190,846	190,846	190,846	572,538
PV	0	173,496	157,724	143,385	474,606
Total Loss					(900,000)

(2) Discount 交易方式：

Loss on discount basis in case of *default* by the Issuer

Discount Basis	0 Yr	1 Yr	2 Yr	3 Yr	
DF	1.0000	1.1000	1.2100	1.3310	Total
Cash Outflow	100%	3%	3%	3%+(130%-100%)	
	(1,000,000)	(30,000)	(30,000)	(330,000)	(1,390,000)
PV	(1,000,000)	(27,273)	(24,793)	(247,934)	(1,300,000)
Cash Inflow		L + 608bps	L + 608bps	L + 608bps	
	0	160,846	160,846	160,846	482,538
PV	0	146,224	132,931	120,846	400,000
Total Loss					(900,000)

如上列表格所示，假設發行者在投資人執行資產交換的第一天就無法履行契約，三年到期之後，投資人最大的損失即最大風險不論是以 par/par 方式或者 discount 方式都是 900,000.00。

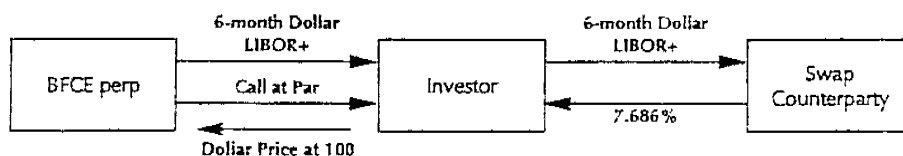
DF：Discount factor，折現因子

PV：Present Value，折現值

四、現金流量說明：

1. 浮動利率交換固定利率的合成證券：

假設投資人以 par/par 的方式購買一筆 1996 年 8 月發行以美金計價浮動利率永久債券 BFCE，該債券利率為 Libor + 75bp，沒有到期日且不可贖回。同時投資人願意與對手（counterparty）進行利率交換，將該筆浮動利率債券交換為每半年收取固定利息 7.68%，為期 5 年。結合浮動利率債券與資產交換而形成一筆固定利率 7.68% 的合成證券，我們可以以下列現金流量的結構加以說明：



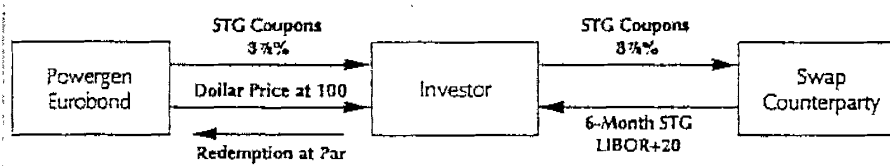
Fixed Rate Return Calculated as:

Received on Bonds	+ 6-month LIBOR+75
Payment to Swap Counterparty	(6 month LIBOR+75)
Received from Swap Counterparty	<u>7.68% s.a.</u>
Net Yield on Synthetic Fixed Rate Asset	7.68% s.a.

日期	投資人購買債券的現金流量	投資人付給交換對手現金流量	投資人收到的淨現金流量
1996/8	(100)		(100)
1997/2	6 個月 libor+75bp	(6 個月 libor+75bp)	7.68
1997/8	6 個月 libor+75bp	(6 個月 libor+75bp)	7.68
1998/2	6 個月 libor+75bp	(6 個月 libor+75bp)	7.68
1998/8	6 個月 libor+75bp	(6 個月 libor+75bp)	7.68
1999/2	6 個月 libor+75bp	(6 個月 libor+75bp)	7.68
1999/8	6 個月 libor+75bp	(6 個月 libor+75bp)	7.68
2000/2	6 個月 libor+75bp	(6 個月 libor+75bp)	7.68
2000/8	6 個月 libor+75bp	(6 個月 libor+75bp)	7.68
2001/2	6 個月 libor+75bp	(6 個月 libor+75bp)	7.68
2001/8	6 個月 libor+75bp	(6 個月 libor+75bp)	7.68
2001/8	100 贖回		

2. 固定利率交換浮動利率的合成證券：

假設投資人在 1986 年 9 月購買一筆以歐洲美元計價的固定收益的債券 Powergen Eurobond，該債券付息 8.875%，不可贖回，到期日為 2003 年 3 月 26 日，並以 Libor+20bp 浮動利率與交換對手進行資產交換交易，為期 5 年。我們從以下表格說明現金流量的結構：



Fixed Rate Return Calculated as:

Received Coupons on Imasco	+ 8%
Payment to Swap Counterparty	8%
Received from Swap Counterparty	+ LIBOR + 20
Net Yield on Synthetic FRN	LIBOR + 20

日期	購買債券的現金流量	付給交換對手現金流量	交換對手付出	投資人的淨現金流量
1986/9	(100)	(100)		(100)
1987/3	8.875	8.875	(6個月 libor+20bp)	(6個月 libor+20bp)
1986/9	8.875	8.875	(6個月 libor+20bp)	(6個月 libor+20bp)
1988/3	8.875	8.875	(6個月 libor+20bp)	(6個月 libor+20bp)
1988/9	8.875	8.875	(6個月 libor+20bp)	(6個月 libor+20bp)
1989/3	8.875	8.875	(6個月 libor+20bp)	(6個月 libor+20bp)
1989/9	8.875	8.875	(6個月 libor+20bp)	(6個月 libor+20bp)
1990/3	8.875	8.875	(6個月 libor+20bp)	(6個月 libor+20bp)
1990/9	8.875	8.875	(6個月 libor+20bp)	(6個月 libor+20bp)
1991/3	100	100		100

一般投資人的債券投資政策是以賺取最大利益為考量，債券殖利率高低雖然可以計算投資人的投資利益，但由於金融市場上存在著許多不確定風險，投資人因而透過資產交換交易期望可以有效地規避或減低某些特定風險，例如投資人可經由利率交換—IRS控管利率風險、貨幣交換—CRS控管匯率風險，由於資產交換契約係依據相關國庫券利率來定價，並可依交易雙方的需求量身打造，因此在充當避險工具上提供投資人極大的空間，並促成資金市場的有效性。

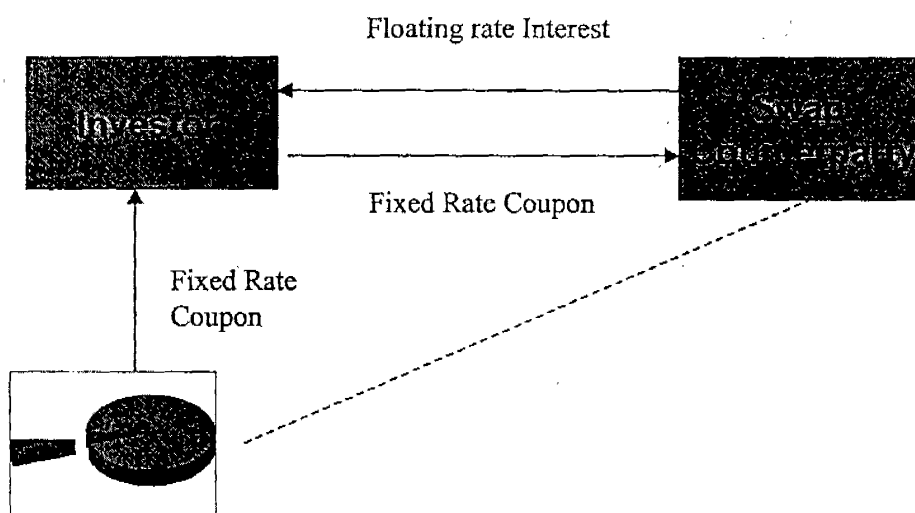
肆、可轉換公司債的資產交換 (ECB Asset Swap)

一、定義：

瞭解資產交換(Asset Swap)的基本概念，就很容易瞭解以可轉換公司債為基礎的資產交換 (ECB Asset Swap)。由於可轉換公司債本身包含債券價值(Bond Value)與股票轉換選擇權(Equity Option)，以台灣銀行為投資人的立場而言，股票轉換選擇權(Equity Option)在銀行法的規定下是不太可能去執行轉換股票權，所以我們在購買可轉換公司債(ECB)時，我們會將股票轉換選擇權(Equity Option)先行分離，不去購買這部份的選擇權，而就債券價值(Bond Value)部份進行資產交換 (Asset Swap)。

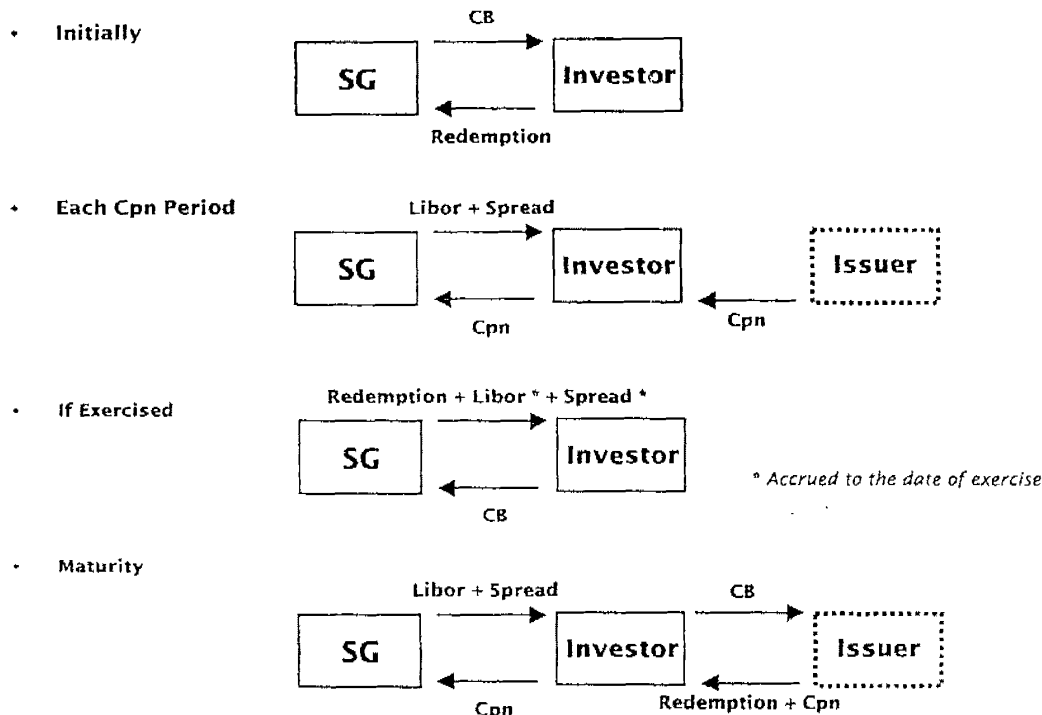
二、圖形說明：

ECB Asset Swap



三、可轉換公司債資產交換的現金流量

分四個階段流程說明：(par/par 交易方式)



1. 購買初期：SG 銀行將可轉換債券賣給投資人 (Investor)，投資人付出一筆可轉換債券的贖回價格給 SG 銀行。
2. 收到票息：附有息票的可轉換公司債的發行者 (Issuer) 會定期付給投資人 (Investor) 一筆固定利率的票息，投資人 (Investor) 再將這部份的票息付給 SG 銀行，以換取 SG 銀行的 Libor + Spread。
3. 執行轉換權：如果在可轉換債券存續期間，SG 銀行決定要行使轉換權 (equity Option)，SG 銀行要付給投資人 (Investor) 相同金額的贖回價格再加上累計到執行轉換權當天的 Libor + Spread，此時投資人 (Investor) 要將可轉換債券還給 SG 銀行。
4. 到期：如果在債券存續期間一直都沒有執行轉換權，到期債券發行者

(Issuer)必須付給投資人 (Investor) 一筆債券贖回金額加上最後一期的票息，投資人 (Investor) 收到金額後將可轉換債券還給債券發行者 (Issuer)，同時將固定利率票息付給 SG 銀行，並且收到 SG 銀行的 Libor + Spread。

四、以鴻海精密工業公司海外可轉換公司債的相關計算方法

以鴻海精密工業公司在2000年11月15日發行的可轉換債券為例來說明：(1)可轉換債券內含的基本發行條款：(2)發行時市場的價格。

鴻海精密工業(股)公司發行海外無擔保轉換公司債相關資料：

1. 募集海外公司債總額:3 億美金
2. 債券每張金額:1000 美金
3. 發行價格:依票面金額十足發行
4. 募集海外公司債之利率:0%
5. 償還方法:除鴻海公司已贖回、買回或行使轉換權外,本公司債到期時,發行公司將以美金面額償還債權人。
6. 期限:5 年
7. 轉換辦法:
 - (1)發行轉換價格:轉換成普通股後為每股新台幣 258.3 元,或轉換成海外存託憑證為每單位美金 16.0684 元。
 - (2)計算轉換價格匯率 1USD=32.15NTD

DES

DGT4 Corp DES

SECURITY DESCRIPTION

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HON HAI PREC HONHAI0 11/15/05 97.13682/98.13682 (3.14/2.02) BGN @12/02

CONVERTIBLE INFORMATION	IDENTIFIERS	
CONV TO 124.4677 SHARES	Common 012026951	1) Additional Sec Info
PER 1000.00 NOMINAL DP100%	ISIN XS0120269518	2) Put Schedule
2317 (TT)TR183 (0.77)	BB number EC3093183	3) Softcall Schedule
CONVERTIBLE UNTIL 10/15/05	RATINGS	4) Convertible Info.
PARITY 68.90 PREMIUM 42.43%	Moody's NA	5) Identifiers
	S&P NA	6) Ratings
	FI NA	7) Fees/Restrictions
ISSUER INFORMATION	ISSUE SIZE	8) Disclaimer Page
Name HON HAI PRECISION INDUST	Amt Issued *	9) Involved Parties
Market of Issue EURO-DOLLAR	USD 300,000.00 (M)	10) Custom Notes
SECURITY INFORMATION	Amt Outstanding *	11) Issuer Information
Coupon 0 ZERO COUPON	USD 300,000.00 (M)	12) ALLQ
N/A ISMA-30/360	Min Piece/Increment	13) Pricing Sources
Maturity 11/15/2005 Series REGS	1,000.00/ 1,000.00	14) Related Securities
CONV/PUT	Par Amount 1,000.00	
Country TW Currency USD	BOOK RUNNER/EXCHANGE	
1st Coupon Date	GS	65) Dtd DES
Price @ Issue 100	LONDON	66) Send as Attachment
Calc Typ (1)STREET CONVENTION		
NO PROSPECTUS		

PRX/SHR=US\$8.0342 (TWD32.15=US\$1). INIT CVR PREM=23%. PROV CALL. UNSEC'D.

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 Princeton: 609-279-2000 Singapore: 65-212-1000 Sydney: 2-9777-8686 Tokyo: 3-3201-8900 Sao Paulo: 11-3648-4300
 1733-505-1 04-Dec-00 10:32:13



(1) 相關名詞說明:

1. 轉換價格(Conversion price): 轉換價格設定於發行之初, 是指可轉換公司債轉換成標的股票的价格。
2. 轉換比率(conversion ratio): 轉換比率是債券持有人有權將持有的債券轉換成某特定數量的股票, 亦即可轉換公司債可以轉換成標的股票的股數。轉換比率相等於可轉換公司債面額除以轉換價格, 一般而言, 轉換價格在發行之初即已經確定, 除了反稀釋條款中規定在某些情況下可以調整轉換價格以外, 轉換比率通常是不變的。
3. 升水(Premium): 是指轉換公司債的市場價值與債券價值的差額, 由於可轉換債券內含股票轉換選擇權, 所以可轉換公司債在發行時的市場價

格會高於信用風險程度相同的其他普通債券，高出的部份就是所謂的升水。

4. 平價(parity)：亦即每股“內含價值”，可轉換債券的轉換價格固定不變，除非有“resets”條款的稀釋效果，所以轉換比率也是固定的，經由固定的轉換比率，我們可以計算出在每個股價下對應可轉換公司債的平價線，由每一天的現行股價我們就可以計算出 Parity。
5. 債券價值 (bond value)：是指去除可轉換公司債內含的轉換權 (Equity Option) 後所剩餘的價值，也就是單純債券價值的部分。
6. 轉換價值 (conversion value)：是指可轉換公司債轉換成標的股票之後的總價值，在不考慮該債券轉換成標的股票之後對公司股權的稀釋效果下，轉換價值等於轉換比率乘上股票市場價值。
7. 反稀釋條款 (anti-dilution clause)：當可轉換公司債券發行公司的普通股股份產生變動時，例如：現金增資、盈餘或資本公積轉增資、公司合併或股票分割等情況發生時，由於這些情況的發生或多或少會影響到股票價值，間接影響可轉換公司債券持有人的轉換價值，為避免影響可轉換公司債券持有人的權益，發行公司都會設有保護條款向下調整轉換價格，以保護轉換價值不受影響。

(2) 計算方法: 以鴻海公司的可轉換公司債為例

1. 轉換價格 (Conversion price): PRX/SHR

$$\begin{aligned} & \text{NT\$ } 258 \cdot 3 \text{ (轉換成普通股後每股價格)} \\ \text{Conversion price} &= \frac{\text{-----}}{32 \cdot 15 \text{ (固定匯率)}} \\ &= \text{USD\$ } 8 \cdot 0342 \end{aligned}$$

2. 轉換比率 (Conversion ratio)

$$\begin{aligned} & \text{Bond Face Value} \\ \text{Conversion ratio} &= \frac{\text{-----}}{\text{Conversion price}} \\ & \frac{1000}{\text{-----}} \\ & \frac{1000}{8 \cdot 0342} \\ &= 124 \cdot 4677 \end{aligned}$$

3. 平價(Parity)

$$\begin{aligned} \text{Parity} &= \frac{\text{Current Share Price} * \text{Conversion Ratio}}{\text{Bond Face Value} * \text{Spot FX}} \\ &= \frac{183 * 124.4677}{1000 * 33.06} \\ &= 68.90 \end{aligned}$$

4. 升水(Premium)

$$\begin{aligned} \text{Premium} &= \frac{\text{債券市場價格} - \text{債券內含價值}}{\text{債券內含價值}} \\ &= \frac{98.13682 - 68.90}{68.90} \\ &= 42.43\% \end{aligned}$$

五、Spread(加碼)

Spread 是交易市場中用來反映發行者隱含的信用風險評估。通常在可轉換債券的資產交換市場投資人可以享有較高的 Spread, 這還是要歸因於可轉換債券內含股票選擇權。

現在仍以 Bloomberg 的畫面說明鴻海精密工業股份有限公司所發行的可轉換公司債：在畫面上鴻海精密工業股份有限公司的可轉換公司債 ECB 的價格為 98.13682。

在 Swapped Spread Details 中的 Calculate 3 是可供投資人輸入已知的債券價格，將債券價格資料輸入後，我們可以得到 Spread 的點數。

另一方面 Calculate 1 是可供投資人輸入已知的 Spread 的點數，當我們將 Spread 的點數資料輸入後我們可以得到債券價格。

假設目前交易市場中的 Bond Price 為 92 元，如前所提 $ECB = Bond + Equity Option$ ，所以此時的 Equity Option Value 為 6.13682(如 30 頁上、下圖)。

我們將資料輸入 Bloomberg 的 Swapped Spread Details 選擇 Calculator 3，在 Bond Price 的欄位輸入價格 92 元，此時 Spread(bp) 出現 234.1bp。

我們再假設目前交易市場中的 Bond Price 為 90 元，此時的 Equity Option Value 為 8.13682(如 29 頁上、下圖)。我們一樣將資料輸入 Bond Price 的欄位，結果 Spread (bp) 出現 452.4bp。

我們可以很清楚地知道 Bond Price 愈高，Spread 愈低，這是因為市場利率與債券價格(Bond Price)成反比，而 Spread 的價格與市場利率成正比。

值得一提的是假設在可轉換公司債債券(ECB)價格不變下，Bond Price 的價格愈高，股票轉換權(Equity Option) 價格愈低。

當交換對手要 offer 一個 Floating Rate 的時候，通常會將股票轉換權(Equity Option) 的價格壓低，因為股票轉換權(Equity Option) 價格愈低，債券價格(Bond Price)愈高，所得到的 Spread 愈低。

所以我們必須先根據當時的市場利率(Yeild)去判斷債券價格(Bond Price)，再根據所判斷的債券價格(Bond Price)換算出 Spread 的點數(basic point)。

basic point (基本點)，一個基本點為 1/100% 用來衡量殖利率及其變動。

<HELP> for explanation.
Curve Source: CMPN

DGT4 Corp ASU

ASSET SWAP CALCULATOR Page 1 of 2
HON HAI PREC HONHAI0 11/15/05 97.13682/98.13682 (3.14/2.02) BGN 012/02

Currency		Bond		Underlying Curves	
From USD	To USD	Buy/Sell	\$ Par Amt	Price Date	US US
		Workout	11/15/01 @ 100.0000	12/ 4/00	23<SWYC#> 23
Spot F/X 1.000		Swap		Crv Settle <B/A/M>	
Trade Settlement 12/ 7/00		Fixed	6.65081% 30E/360 1	12/ 7/00 BGN BGN	
		Floating	6.73439% ACT/360 4	Z-Spread 523.9 bp	
		Swap Par Amt(FLT)	1000 M		

Gross Spread Valuation		
Valuation without equity/fixed income option component	Money	Spread(bp)
Implied Value 94.1450	41.5M	= 452.4

Swapped Spread Details		
Calculate 3	Money	Spread(bp)
1: Bond Price 90 / 11.83432%		
Swap Price 100 Cash Out -10.0000	100.0M	= 1091.3 bp
2: Swap Rate 6.65081% Bond Cpn 0.0000%	-58.5M	= -639.0
Redemption Premium / Discount 0.0000	0.0	= 0.0
Funding Spread 0.0 bp	-0.0M	= 0.0
3: Swapped Spread		452.4 bp

1 <Go> for X-currency spread summary, 2 <Go> to save, 3 <Go> to update swap crv

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Princeton: 609-279-3000 Singapore: 65-212-1000 Sydney: 2-977-8686 Tokyo: 3-3201-8900 Sao Paulo: 11-3048-4500
1733-505-1 04-Dec-00 10:38:04



<HELP> for explanation.

DGT4 Equity OV

Standard Option Valuation			Page 1/2
2317	TT	HON HAI PRECISION INDUSTR	Currency: TWD
Price of 2317 TT Equity 192			Hit 1 GO for save/send screen Hit 2 GO for notes Hit 3 GO for dividends Hit MENU for exotic option types Hit PAGE for scenario graph
Strike:	258	141.758% (TWD) Rate: 5.029%	NOTE: Riskfree rate has been adjusted
Exercise Type:	A American		
Put or Call:	C Call		
Time to Expiration:	1075 18:21	Model Type: 1 Default	
Trade:	12/ 4/00 10:39		
Expiration:	11/15/03 05:00		
Settle Date:	12/ 4/00		
Exercise Delay:	0		
Option Valuation and Risk Parameters		Dividends	
Value	Percent	Time Value:	8.13682
Price: 8.13682	4.471%	Theta:	0.01434
Volatility: 16.647%		Premium:	46.22902
Delta: 0.28793		Parity:	-76.00000
Gamma: 0.00656		Gearing:	22.36746
Vega: 1.08030		Rho	1.38083
		Dividend Yield	0.00%
		Ex-Date	Amount
		No dividends proj.	

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1733-505-1 04-Dec-00 10:43:07



<HELP> for explanation.
Curve Source: CHPN

DGT4 Corp ASW

ASSET SWAP CALCULATOR

Page 1 of 2

HON HAI PREC HONHAI0 11/15/05 97.13682/98.13682 (3.14/2.02) BGN @12/02

Currency		Bond		Underlying Curves	
From USD	To USD	Buy/Sell	Par Amt	Price Date	US US
		Workout	11/15/01 e 100.0000	12/ 4/00	23<SWYCH> 23
Spot F/X 1.000		Swap		Crv Settle	<B/A/M>
Trade Settlement		Fixed	Coupon	Day Count	Freq
12/ 7/00		6.65081%	30E/360	1	
		Floating	6.73439%	ACT/360	4
		Swap Par Amt(FLT)	1000 M		
				Z-Spread	265.0 bp

Gross Spread Valuation

Valuation without equity/fixed income option component	Money	Spread(bp)
Implied Value	94.1450	21.5M = 234.1

Swapped Spread Details

Calculate	Money	Spread(bp)
1: Bond Price	92 / 9.26164%	
Swap Price	100	
2: Swap Rate	6.65081%	
Redemption Premium / Discount	0.0000	
Funding Spread	0.0 bp	
3: Swapped Spread		234.1 bp

1 <Go> for X-currency spread summary, 2 <Go> to save, 3 <Go> to update swap crv

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1733-505-1 04-Dec-00 10:33:57



Standard Option Valuation Page 1/2
2317 TT HON HAI PRECISIONIndustr Currency: TWD

Price of 2317 TT Equity 182	Hit 1 GO for save/send screen Hit 2 GO for notes Hit 3 GO for dividends Hit MENU for exotic option types Hit PAGE for scenario graph
Strike: 250 141.758% (TWD) Rate: 5.029% Continuous	NOTE: Riskfree rate has been adjusted
Exercise Type: A American	
Put or Call: C Call	
Time to Expiration: 1075 18:21 Model Type: 1 Default	
Trade: 12/ 4/00 10:39	
Expiration: 11/15/03 05:00	
Settle Date: 12/ 4/00	
Exercise Delay: 0	

Option Valuation and Risk Parameters				Dividends	
Price:	Value	Percent	Time Value:	Dividend Yield	0.00%
Volatility:	6.13682	3.372%	Theta:	Ex-Date	Amount
Delta:	14.712%		Premium:	No dividends proj.	
Gamma:	0.25193		Parity:		
Vega:	0.00694		Gearing:		
	1.01668		Rho:		

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1733-505-1 04-Dec-00 10:40:56



伍、研習心得

可轉換公司債是國際債券市場常見的投資工具，投資於可轉換公司債、承做利率交換交易約可賺取一定的利差。目前在國際金融市場上 Bloomberg 是廣泛被使用於債券市場評價分析工具，Bloomberg 系統提供發行者的債券評等、債券價格、債券殖利率、資產交換價格、基本發行條款、買賣價即時資料及其他相關資料。投資人可以在 Bloomberg 可供計算的畫面中輸入自行設定的參數，評估交易對手提供的交易金額是否合理，由於市場價格決定於供給者與需求者之間的互動，經由互動關係做成正確的決策。

本行依據財政部頒訂之「國際金融業務分行管理辦法」所修訂之「台灣銀行總行審核國際金融業務分層授權準則」辦理「對銀行同業授信」及「買賣有價證券」業務，其外幣信用評等應符合本準則規定。

其中買賣有價證券的種類包括「政府債券」及「其他有價債券」，可轉換公司債也在「其他有價債券」之列，規定各單位買賣公司企業所發行之有價證券應屬有擔保性質，且符合下列（1）及（2）之規定，始得依授權額度續做業務：

- （1）該有價證券或其發行者、保證者短期債信評等應為相當於 MOODY'S 評定 P-2 級、S&P 評定 A-2 級或 FITCH IBCA 評定 F2 級（含）以上之等級，長期債信評等應為相當於 MOODY'S 評定 A3 級、S&P 評定 A-級或 FITCH IBCA 評定 A-級（含）以上之等級。
- （2）上開有價證券，應具有於次級市場流通之市場性。

基於政策所規定的債信評等、ECB 稅負問題以及會計處理原則上有關收入認列的爭議，本行對於承作可轉換公司債的業務諸多考量，目前大都採取穩健策略，職僅以有限金融知識，分享此次研習的心得。

陸、建議事項

由於可轉換公司債產品的特性頗為複雜，因而在從事產品交易時，交易人員的專業知識、市場交易經驗以及電腦軟硬體設備的裝設都會影響到交易人員對於可轉換公司債產品的評價。

以本行為投資者的角度來評估可轉換公司債的投資價值，大抵是採取穩健保守的投資原則，以分散風險為主要考量，因此要充分瞭解可轉換公司債產品以評估風險程度的大小。

如何瞭解投資產品以及評估風險呢？除了參考金融市場的現況、國際股票、外匯市場的變動以及產業狀況外，電腦軟體的更新、充分的硬體設備以及培訓專業人員以提升市場交易人員的金融技術更是刻不容緩。

近來財政部為活絡國內債券市場，責成相關單位研擬具體實施方案，未來投資管道將更多樣化並富彈性化。因此職 建議本行有關單位就衍生性金融商品的投資操作、評估能及早做好專業人才的養成。

參考資料：

- 1、 Kevin B、Connolly “Pricing Convertible Bonds”
- 2、 Morgan Stanley Dean Witter “Convertible Research”
- 3、 Societe Generale Asia Limited “Asset Swap on Convertible Bond”
- 4、 Bear Stearns ” Convertible Bonds ”

Hon Hai Precision (2357.TW/2357 TT)

Maintain BUY

3Q00 results review (unconsolidated) – strong revenue growth with better gross margins

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Michael Lo 852 2101 7186 michael.lo@csfb.com

- Hon Hai reported its 3Q00 results yesterday. Turnover was up 94% to NT\$26.5 bn compared to 3Q99. Gross profit came in at NT\$3.8 bn, a 89% YoY increase. Operating profit was NT\$2.39 bn, a 69% increase from 3Q99. Net profit was up 33.7% to NT\$3.1 bn.
- The gross profit margin increased for the third straight quarter to 14.4% from 13.8% in 2Q00, beating our estimate of 12.7%. We believe Hon Hai was able to increase its gross margin due to economies of scale and an excellent cost control, although consolidated gross margins are more meaningful as they would include the China operations.
- The global outsourcing trend is expected to continue and benefit industry leaders like Hon Hai, as they are able to minimise costs for OEM manufacturers. Hon Hai's PC-related business is still strong, despite global PC growth uncertainties. Revenues from Dell and Apple actually increased in 3Q00, despite their earnings pre-announcements. In our view, outsourcing is expected to continue to manage costs.
- We like Hon Hai for its consistent growth potential, as again shown by the 3Q00 earnings and revenue results, which are expected to continue into 4Q00. We are maintaining our 4Q00/2000 forecasts, which were recently revised up. We reiterate our BUY recommendation with a 12-month target price of NT\$260.

Price	Index	GDR/GDRB	GDR price	Dividend	Yield	Market cap.	Market cap. price range	52-week price range
(NT\$)		(x)	(US\$)	(NT\$)	(%)	(NT\$ mn)	(US\$ mn)	(NT\$)
175	5859	2	11,3125	0.789	0.44	25,4275	7852	146-288
Year-end	Net profit	EPS	EPS	P/E	EPS GDR	EBITDA	ROIC	EV/IC
2000F	(NT\$ mn)	(NT\$)	growth (%)	(x)	(US\$)	(NT\$ mn)	(%)	(x)
2000F	17,779	12.24	26.1	14.3	1.81	19,400	23.4	3.8
2001F	14,099	9.70	30.0	18.0	2.41	15,900	25.6	5.2
2000F	10,140	8.98	28.6	25.1	1.76	12,150	24.7	5.9
1999A	7,413	5.43	32.0	32.2	1.94	9,518	25.4	7.3
1998A	5,501	4.11	48.0	42.5	2.97	7,175	33.6	7.1
Quarterly EPS	Mar	Jun	Sep	Dec				
2000F	1.10	1.83	2.15	2.26				
Shares outstanding (mn)	1,453			Book value / share – 12/00E (NT\$)	33.34			
Daily trading volume – 9M avg. (mn)	6.36			Net debt / equity – 12/00E (%)	Net cash			
Free float (%)	53.00			Est. 3-year EPS growth (%)	33.86			
Major shareholders (%)	30.05			Current EV (NT\$mn)	249,856			
Abs. performance (1: 3, 12 months)	(8.85)	(27.39)	2.02	Rel. performance (1: 3, 12 months)	(0.36)	4.13	41.60	

Results highlights and analysis

Hon Hai has reported 34% YoY earnings growth to NT\$3.1 bn for 3Q00, on the back of 94% growth in turnover to NT\$26.4 bn. Operating and non-operating profit came in at NT\$2.4 bn and NT\$1.4 bn, respectively. The strong earnings growth was driven mainly by a stronger-than-expected gross margin of 14.4%, which surprised us on the upside and beat our conservative estimate of 12.7%. As a result, net income was also above our forecast at NT\$3.1 bn versus our forecast of NT\$2.85 bn, a 7.8% difference.

Hon Hai was able to increase its revenues and gross margin during an unclear period for PC demand, which strongly suggests that many OEMs are increasing their outsourcing in order to remain competitive in the cut-throat PC market. Hence, we believe that beneficiaries of this outsourcing trend will be companies like Hon Hai, who have the scale and resources to cater for the top-ten PC manufacturers in the world.

We believe economies of scale have kicked in and that they have helped Hon Hai to become one the most efficient connectors/enclosures manufacturers in the world, leaving its competitors far behind. Also, with most of its products being produced in China, the company is benefiting from China's low labour costs.

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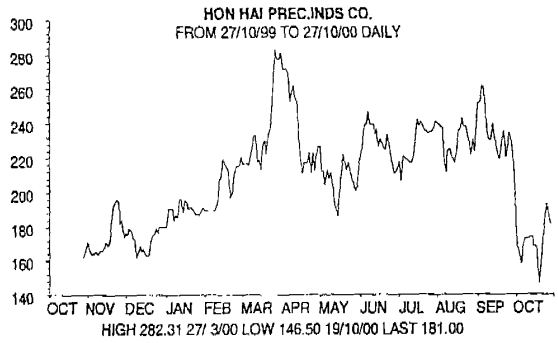
Forecast and outlook

Going forward, we believe Hon Hai will remain one of the dominant PC connector and barebone makers in the world. In addition, its non-PC related business, in both the communications and consumer electronics industries, is expected to grow even faster resulting in a forecast revenue CAGR of 50% over the next three years.

It is important to point out that industry consolidation is expected to occur in the low-cost/high-volume PC connector/desktop industries, and global PC OEMs are being forced to outsource even more to remain competitive. We believe that large companies with scale and customer bases, like Hon Hai, which although are still correlated to PC growth, will far outperform and grow faster from market-share gains.

We are maintaining our 4Q00 forecast, which was recently revised upward. Despite the recent rally in the share price and short-term political uncertainties in Taiwan, we believe that it is still a good time to accumulate the stock at the current level simply for its strong growth potential. In our view, the stock is still undervalued and we reiterate our BUY recommendation with a 12-month target price of NT\$260 implying 49% upside potential.

3Q00 NT\$mm	CSFB		%YoY	
	Estimate	Actual	growth	% difference
Net Revenue	26,396.1	26,449.9	94.2	0.2
Gross profit	3,350.0	3,814.3	89.3	13.9
Gross profit margin	12.7	14.4		
Operating profit	2,100.0	2,386.4	69.2	13.6
Operating profit margin	8.0	9.0		
Non-operating income	1,240.0	1,352.8	7.9	9.1
Non-operating income margin	4.7	5.1		
Net income	2,854.3	3,076.7	33.7	7.8
Net margin	10.8	11.6		



Source: Primark Datastream

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MORGAN STANLEY DEAN WITTER

Convertible Bond Asset Swap - Draft Confirmation – ASCOT Buyer

To:

Attn.:

Fax No:

From: Morgan Stanley + Co. International Limited, London. Member of FSA.

Date:

Our File Ref:

Our Swap Ref:

Taps Ref:

Re: **Convertible Bond Call and Notional Swap Transaction between Morgan Stanley + Co. International Limited and**

The purpose of this facsimile (this "Confirmation") is to confirm the terms and conditions of the bond option transaction and notional swap transaction entered into between Morgan Stanley + Co. International Limited and you on the Trade Date specified below (respectively, the "Bond Option Transaction" and the "Notional Swap Transaction"; together the "Transaction"). This Confirmation constitutes a "Confirmation" as referred to in the ISDA Master Agreement specified below.

The definitions and provisions contained in the 1991 ISDA Definitions (as supplemented by the 1998 Supplement, and as amended and supplemented by the 1998 ISDA EURO Definitions) (the "Swap Definitions") and in the 1997 ISDA Government Bond Option Definitions (the "Bond Definitions", and together with the Swap Definitions, the "Definitions"), in each case as published by the International Swaps and Derivatives Association, Inc., are incorporated into this Confirmation. The Bond Definitions apply in relation to the Bond Option Transaction (paragraphs 2 and 3(1) below). For purposes of the Bond Definitions, the Bond Option Transaction will be deemed to be a Government Bond Option Transaction. The Swap Definitions apply in relation to the Notional Swap Transaction (paragraph 4 below). In the event of any inconsistency between either set of Definitions and this Confirmation, this Confirmation will govern.

This Confirmation supplements, forms part of and is subject to, the ISDA Master Agreement dated as of, as amended and supplemented from time to time (the "Agreement"), between Morgan Stanley + Co. International Limited and you. All provisions contained in the Agreement govern this Confirmation except as expressly modified below).

The Terms of the Transaction to which this Confirmation relates are as follows

1. General Terms:

Party A: Morgan Stanley + Co. International
Limited

Party B:

Trade Date: Time of execution of the transaction is
available upon request.

2. Terms of Bond Option Transaction:

Terms of Bond Option Transaction as follows:

Option Style: American

Option Type: Call

Seller: Party A

Buyer: Party B

Bonds:

Stock Redemption: Should the Redemption be for Stock, as provided in the Terms and Conditions of the Bonds, Party B will pay to Party A a USD amount equal to the Redemption Amount of the Bonds, and Party A will deliver to Party B the Redeemed Bonds. This is providing Party A notify Party B of the Stock Redemption by at least Three (3) London and New York Business Days Prior to the 25 August 2003 Bond Maturity Date.

Bond Maturity
Date:

Investor Put
Date:

Number of
Options:

Option
Entitlement:

Option Strike
Price: 100.00 PCT.

Option
Penalty: If the Option is Exercised for a Settlement Date prior to then Party B will make an Additional Payment to Party A of the present value of X basis points on the notional amount accruing from the Settlement Date until

Premium: USD 1.00 (Receipt of which is hereby acknowledged)

Premium Payment
Date:

Procedure for Exercise:

Multiple
Exercise: Applicable

Exercise Period: Any Seller Business Day during the period commencing on and including the Premium Payment Date and ending on and including the Expiration Date between 8.30 a.m. and 4.00 p.m. (London time).

Seller Business
Day: Any day on which commercial banks are open for business (including dealings in foreign exchange and foreign currency deposits) in

Expiration Date: The first to occur of:

- (a) The date on which notice is first given to the Holder of the Bonds by the issuer of the Bonds that any of the Bonds which are the subject of this Bond Option Transaction are for any reason called or redeemed by the issuer of the Bonds (expiration is limited to the Number of Options proportionate to the percentage of Bonds called or redeemed by the issuer of the Bonds), and
- (b) The Investor Put Date, and
- (c) The Bond Maturity Date, and
- (d) Default Date

"Holder of the Bonds" means, at any given time, the holder as determined by the Calculation Agent in its sole discretion,



Global Convertibles Product Guide

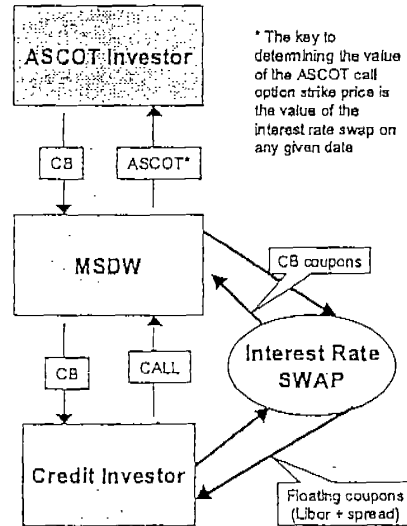
Understanding ASCOTs — (Asset Swapped Convertible Option Transactions)

August 2000

The convertible asset-swap product has come to play an increasingly vital role in the functioning of convertible bond markets globally, especially in Europe and Japan, where convertible issuer credit's tend to be of a higher grade. This guide is meant to serve as an introduction for investors who are not already familiar with the product and to demystify what are essentially very straight-forward transactions.

We look to summarise the:

- Structuring and pricing of ASCOTs – including a quick tutorial on the Bloomberg's ASW function.
- Motivations for the different investor-types in entering ASCOT transactions – both from the credit buyer's and option buyer's perspective.
- Relevant information on entering into asset-swap transactions with Morgan Stanley's AA-minus rated entity – including key contacts on the trading and documentation.



* The key to determining the value of the ASCOT call option strike price is the value of the interest rate swap on any given date

Source: Morgan Stanley Dean Witter Research

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1. Development of the Market

Asset swaps within the fixed income markets experienced explosive growth during the 1990's due to a surge in investor appetite for bonds packaged with swaps to create synthetic floating rate securities. They are now an established part of the world's credit markets. The global convertible market has taken advantage of this and convertibles now form a significant part of the corporate asset swap sector.

Convertible bond asset swaps involve the restructuring of convertible bonds into synthetic debt securities and equity call options. In this way they offer the opportunity for different investors to participate in the separate attractive characteristics embedded in convertible bonds and have, by implication, widened the appeal of this asset class to a broader group of investors.

Asset swaps play an important role in the pricing and sizing of convertible bonds in both the primary and secondary markets. No pricing discussion of a potential new issue occurs nowadays without a thorough assessment of the appetite for the asset swapped bonds. Spread discussion is referenced to the relevant swap curves (LIBOR Euribor etc.), therefore it is no longer practical to value convertibles on a spread-to-government bonds basis, particularly as swap/government spreads have become increasingly volatile themselves.

The development of the asset swap market has contributed greatly to ability of companies to issue large sized deals into the market and has also been partly responsible for the explosive growth in hedge funds investing in convertible bonds whose ability to run large positions has been enhanced by the risk reduction that this product offers.

There are no official statistics, but we estimate that in excess of \$50 billion notional has been asset swapped over the past 3 years alone in the Japanese, European, Asian and American convertible bond markets.

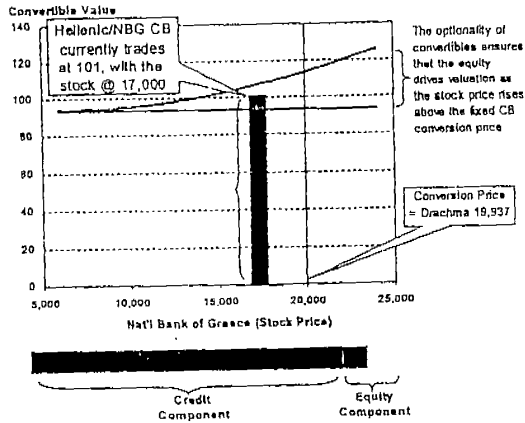
This guide offers a summary of some of the reasons why investors participate in this product. It looks at the mechanics of the transactions and highlights some of the key issues to be aware of. Included in the appendix, we provide indicative levels, across a wide spectrum of convertibles, of credit spreads based on our actual experience in the marketplace, both recent and historical.

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2. Splitting a Convertible Bond

Asset swapping is the splitting of a convertible bond into its two separate components. These are then purchased by investors seeking separate return profiles. These two components can be reassembled at any time at the option of the equity component holder.

Exhibit I
Hellenic Finance/National Bank of Greece 2% due 07/2003



Credit Component:	Equity Component:
<ul style="list-style-type: none"> - Pure Bond Value - The credit investor buys Synthetic Floating Rate Note - Benefits to investor include access to a wider choice of credits as well as typically higher spreads than in other corporate bond markets. 	<ul style="list-style-type: none"> = Call Option = the ASCOT The equity investor buys CB call option (ASCOT) Benefits to investor include off-balance sheet treatment and ability to eliminate credit risk exposure to the issuer.

3. Who are the Investors?

The Credit Component – Convertible bond asset swaps offer the corporate credit buyer greater spreads than are available in the FRN, Bank Finance and Syndicated Loan Markets and give access to a more diverse range of borrowers.

- > Bank Corporate Lending Departments
- > Corporate Treasuries
- > Bond & Money Market Funds
- > Insurance Companies

The Equity Component – Convertible bond asset swaps offer the ASCOT buyer a pure and leveraged play on the underlying equity of a convertible bond while eliminating credit risk and giving an improved interest rate risk profile

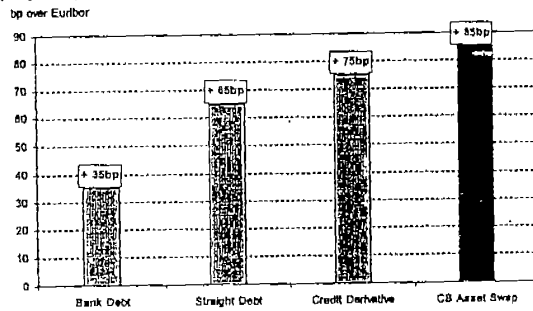
- > Hedge Funds
- > Convertible Funds
- > Institutional Equity Investors
- > Retail Investors

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4. What does the Credit Investor Get?

The credit investor receives a higher spread than is normally available on more traditional investments. He also gains access to a wider range of corporate credits where there may be limited opportunity in the market to purchase conventional products. In return he accepts the feature which allows the ASCOT holder to recall the asset swap package at any time. He also accepts the lower liquidity inherent with this being a structured package.

Exhibit 2
Current Euribor-plus Spreads Available on Different Forms of Vivendi Credit (May 2000)



Source: Morgan Stanley Dean Witter Research

5. What does the ASCOT investor get?

> **Leverage** – ASCOTs give the same upside exposure to direct investment in convertible bonds but with a smaller initial outlay. This is particularly attractive to leveraged hedge funds.

> **Zero Credit Risk** – There have been many examples of convertible bonds whose theoretical bond floors have failed to hold due to deteriorating credit circumstances. ASCOTs lock in the bond floor.

> **Off Balance Sheet Financing** – Transferring the ownership of convertible bonds but retaining the ASCOT successfully achieves an off-balance sheet position financed at a rate defined by LIBOR plus the recall spread

> **Improved Interest Rate Risk Profile** – Convertible bond positions have negative Rho. If rates rise the pure bond value falls but with ASCOTs the strike price declines thereby offsetting the fall in value of the bond.

> **Purer Access to Cheap Pricing Volatility** – ASCOTs provide the final piece of the hedging jigsaw. Hedging equity, interest rate and credit risk allows investors to capture effectively the cheap implied volatility of a convertible bond with no loss in liquidity.

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6. Mechanics of the Transaction

The Credit Buyer is effectively buying a callable synthetic floating rate note:-

> The investor purchases from Morgan Stanley an asset swap package which comprises a notional amount of convertible bonds, the asset, coupled with an interest rate swap. The price paid is typically 100% of notional.

> The interest rate swap agreement is for the investor to pay Morgan Stanley the fixed coupons of the convertible bond (2% from Exhibit 3) in return for receiving quarterly floating rate coupons set at EurIBOR (or LIBOR) + the agreed spread (EurIBOR +40bp from Exhibit 3).

> The future cash flows on the fixed leg of the swap (CB coupons) are typically lower than those on the floating leg. By discounting all these future cash flows by the zero coupon curve implied in the swap curve we can calculate the Net Present Value of the swap (in this illustration, that comes to 6.60% of the notional). This NPV typically has a negative value to Morgan Stanley reflecting the excess in value of payments owing over receivable payments.

> Morgan Stanley retains an option to repurchase the entire package, bonds plus swap, from the credit investor at 100% plus accrued interest.

The ASCOT Buyer is effectively buying an OTC call option to purchase a Convertible Bond:-

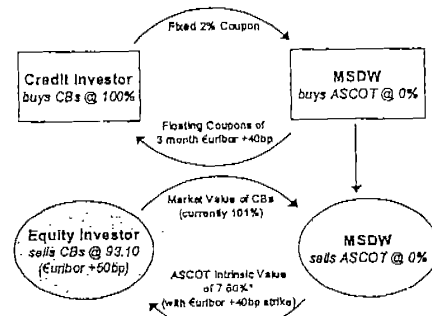
> Assuming the ASCOT investor already owns convertible bonds, he will sell those bonds at a price which is calculated by subtracting the NPV of the interest rate swap from 100% of the notional value of the bonds. This can be viewed as the pure bond floor.

> Morgan Stanley has therefore purchased bonds at one price and sold them to the credit buyer at 100%. The difference between these two is the swap NPV (6.60%) and by keeping this Morgan Stanley is able to meet its obligation on the swap payments i.e. it pays for the shortfall of the payments made on the floating leg versus the payments received on the fixed leg.

Exhibit 3

Typical Asset-Swap Transaction Flowchart:

Illustrates the Hellenic Finance/National Bank of Greece 2% due 07/2003



* The ASCOT buyer sells CBs @ 93.10 (Euribor +50) but the strike price immediately becomes 93.40 (Euribor +40). This reduces the 30bp strike spread of entering into the transaction. The intrinsic value of the ASCOT becomes 7.60 (101 less 93.40)

Source: Morgan Stanley Dean Witter

> The ASCOT investor simultaneously purchases at zero cost from Morgan Stanley an option to repurchase the convertible bonds. The strike price is set at 100% minus the unwind value of the associated interest rate swap on the date of exercise.

> The option strike price is therefore floating rather than fixed. The unwind value of the swap is the Net Present Value of the remaining fixed and floating cash flows of the interest rate swap. The strike price thus increases/decreases as interest rates fall/rise. At maturity however the strike price is 100%

> The ASCOT is an individually negotiated contract with Morgan Stanley and has no public secondary market. It can however be reassigned to a third party subject to consent.

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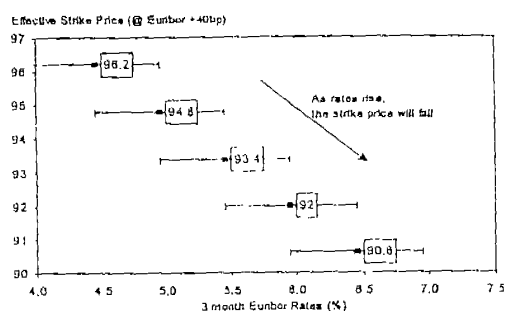
7. Option Call Features

- > An ASCOT is an American-style over-the-counter call option to repurchase a convertible bond.
- > The holder may exercise at any time but there may be restrictions for exercising within the first six months.
- > Bonds will be delivered back to the ASCOT holder for value date a maximum 10 (but typically less) days following exercise.
- > The expiry date of the option is set to match either the maturity date or the put date of the underlying convertible bond.
- > If the issuer calls the convertible bonds for early redemption under the terms and conditions of the bonds then automatic exercise of the ASCOT is triggered whereby the holder must repurchase the bonds. This avoids the potential scenario of missing the final date for conversion of bonds to equity.
- > If the issuer of the bonds defaults, the ASCOT will expire 10 days later.

8. Strike Price Features

- > The strike price can be viewed as the pure bond value and is therefore subject to interest rate movements. In a stable interest rate environment the strike price rises steadily towards the convertible bond redemption price over time.
- > The spread of the reference swap which determines the strike price is agreed at the opening of the ASCOT position. This spread is typically 10-20bp tighter than the spread used to determine the initial sale price of the bonds to Morgan Stanley and should be viewed as the Bid/Offer cost of the transaction.
- > The floating strike is by no means the only structure employed in creating ASCOTs. Options can also be structured with fixed strikes or strike prices referenced to a fixed yield to maturity. Such structures are subject to acceptance by the credit investor.
- > The 'ASW' security specific function on Bloomberg for each individual convertible bond provides an accurate tool for calculating the strike price (see the following page).

Exhibit 4: Illustration of the Interest Rate/Strike Price Relationship



Source: Morgan Stanley Dean Witter Research

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9. The Bloomberg Calculator

The 'ASW' function on Bloomberg for a single convertible bond allows the user to calculate the strike price of an ASCOT from a given credit spread. In the case of the Hellenic Finance / National Bank of Greece bond, by entering the 50bp spread, we derive 93.1 as the effective level at which the ASCOT buyer sells the CBs. The strike is calculated on the offer spread (40bp), equating to a strike of 93.4, using the same methodology.

Exhibit 4: Illustration of the ASW Function on Bloomberg

The screenshot shows the Bloomberg 'ASW' function interface. Callouts provide the following explanations:

- Change the floating leg to quarterly payments (by entering 4):** Points to the 'FREQ' field in the 'Bond' section.
- Set the Bid/Ask side of the curve to use: A - for initial set up B - for recalling bonds:** Points to the 'SIDE' field.
- Ensure that the Default swap curve is set to #45 if EUR; #23 if USD #13 if JPY; #22 if GBP:** Points to the 'CURVE' field.
- Set the calculation mode to 1 (to Calculate Bond Price):** Points to the 'MODE' field.
- The ASCOT buyer effectively sells the CBs at this interpolated price (93.1 in this case):** Points to the 'PRICE' field.
- Enter the spread at which the swap is being executed:** Points to the 'SPREAD' field.

The interface displays the following data:

ASSET SWAP CALCULATOR
 HELLENIC FINANCE HELFIN2 02/15/03 100.00/101.00
 Currency: EUR
 Bond: 100.00/101.00
 Coupon: 5.44500%
 Maturity: 02/15/03
 Spread: 50.00 bp
 Implied Value: 94.7110
 Bond Price: 93.1046
 Swap Price: 100
 2-Swap Rate: 5.44500%
 Funding Spread: 0.00 bp
 3-Swapped Spread: 0.00 bp

10. The Leverage Effect

Leveraged gains are attractive to all types of investors so long as they do not assume extra risk. For a considerably smaller outlay the same exposure to a convertible bond position can be achieved through ASCOTs. Take the following example of ASCOTs in the Japanese electronics company NEC purchased by some of our clients at a timely moment in June 1999. By paying less than 4 points for ASCOTs the buyer had an option on a convertible with a 60 % premium. The subsequent rise in NEC's fortunes have provided a handsome return to the ASCOT holder.

Exhibit 5
NEC #6 1.8% 2002

	June 1st 1999	May 1st 2000	Return
Stock Price	1336	3090	+131%
CB Price	104.00	156.00	+52%
Premium	60%	4%	
Implied Vol	24%	46%	
STRIKE (+80bp)	100.60	101.00	
ASCOT Price	3.40	55.00	+1,518%

Source: Morgan Stanley Dean Witter Research

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11. Protection against Credit Widening

ASCOTs not only provide convertible investors with protection against the ultimate credit risk of issuer default, but also protect against any credit widening which can have a significant impact on the valuation of a convertible bond.

The following is an example of how a holder of ASCOTs fared relative to a holder of the Fullerton/Singapore Telecom 0% 2003 exchangeable bonds during the latest Asian crisis in 1998.

Exhibit 6

Fullerton / Singapore Telecom 0% 2003

Issue Date:	March 1998
STOCK Price:	S\$ 3.2
CB Price:	100
CB Premium:	8%
Strike (L+50):	94
ASCOT Purchase Price:	6

A few months later: (in the height of the Asian crisis)	Sept. 1998
Stock Price:	S\$ 2.5
CB Price:	86 (L+200)
CB Premium:	8%
Strike (L+50):	94.5
ASCOT Intrinsic Price:	0
ASCOT Market Price*:	4

Loss on CB:	14 points
Intrinsic Loss on ASCOT:	6 points
Real Loss on ASCOT:	4 points

Source: Morgan Stanley Dean Witter Research

The holder of the exchangeable bonds lost 14 points during the period under review while the ASCOT holder suffered less. The bond prices declined to 86, which was an implied credit spread of +200, proving convincingly that the debt spread assumptions used in convertible bond models should not be viewed as a static input. The intrinsic loss on the ASCOT was its full 6 points if valued only as the difference between the strike price and the CB price. Obviously an ASCOT of a bond which only carries an 18% premium has to have a value greater than zero. Based on option models and conservative volatility assumptions the market priced these ASCOTs to have a real value of 4 points; thus the decline in ASCOT value was limited to only 2 points.

12. Documentation

➤ Transactions are negotiated with MSIL, Morgan Stanley's operating entity, under ISDA guidelines for swaps & OTC options.

➤ MSIL (Morgan Stanley International Ltd.) is a member of the UK regulating body, the Financial Services Authority (FSA).

➤ All new counterparties are required to have capacity & authority documents approved by MSIL before a transaction can be executed.

➤ All counterparties are required to enter into an ISDA Master Agreement with MSIL.

➤ MSIL is guaranteed by Morgan Stanley Dean Witter & Co. (Aa3/AA-).

➤ MSIL dispatches ISDA confirmations for each transaction which need to be signed and returned.

➤ Morgan Stanley Prime Brokerage offers equity financing services for hedged ASCOT positions.

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同意書

本人同意 90年 3月 5日執行因公出國計畫：

「可轉換公司債、資產交換與利率訂定之操作實務」
所完成之出國報告書，其著作財產權歸屬中華民國

(代表機關：台灣銀行

)

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中 華 民 國 90年 5月 10日