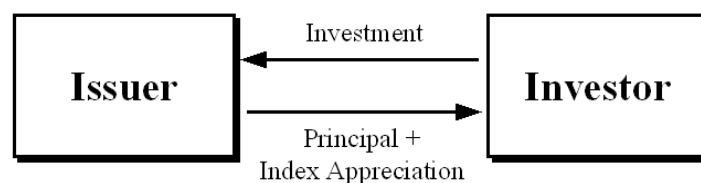


## Index-linked note/security

Index-linked notes/securities (ILS) are defined as debt instruments for which the amounts of the coupon payments (interest) and/or the principal outstanding are linked to the movements of a stock market or price index. ILS are securities whose values are *aggregates* of the cash flows of asset pools and depend generally on the performance of an underlying aggregated index. This means they are linked to a basket of stocks or to other composite securities representing a constant portfolio over a longer time period. Index-linked notes/securities are sometimes referred to *equity index-linked notes* or *real yield securities (REALS)*, if they are linked to an equity index. The underlying assets are the values of individual equity securities.

To illustrate, consider the arrangement of an index-linked security that might be tied to the performance of the S&P 500 (Standard & Poor's composite index of 500 widely held, value-weighted stocks). The value of the ILS will move up or down with the corresponding value of the S&P index. The holder of the ILS participates in any appreciation in the index at a fixed rate, for example 100%. When the coupon payments are index-linked, the full amounts of such payments are treated as interest receivable and payable, in the same way as the interest receivable and payable on any other security paying a contractually predetermined percentage. When the value of the principal is index-linked, the participation rate of 100% of the percentage increase of the S&P index becomes assigned to the security value. At maturity, the investor receives the invested capital plus the participation in the appreciation of the underlying index, and the fixed interest payments. The structure of an ILS is shown in figure 1:



The following table 1 below sets out an example of an S&P indexed bond with an embedded sold option position. Most of the index-linked securities purchases have a guaranty of the original issue price, supplied by a major brokerage house or bank. Buying the ILS at or close to issue price means your principal is protected, however you receive participation in the increase in value of the S&P, respectively any other index the security is tied to. Hence, the capital invested is up to 100% secured and redeemable at maturity. The holder of the security uses this structure to gain yield-enhancement as predominant advantage. Nevertheless it is possible that the *change* in the underlying pool of assets (which reflects the increase in value of the securities that compose it) has a direct impact on the interest payable. It is thus possible that no interest will be paid.

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**Principal-protected Index-linked note – terms and conditions:**

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<b>Issuer:</b>	AAA-rated financial institution
<b>Issue Price:</b>	100%
<b>Amount:</b>	US\$100 billion
<b>Principal Protected:</b>	yes
<b>Coupon:</b>	3 to 3.50% p.a. payable annually in US\$
<b>Index-linked:</b>	S&P 500
<b>Market Participation:</b>	100% of the percentage increase of the index, payable in US\$
<b>Maturity:</b>	5 years
<b>Redemption:</b>	100% of the invested capital <b>plus</b> increase in the underlying index (in US\$) calculated as follows: Market participation × (Underlying index at maturity – Underlying index at issue date) / Underlying index at issue date × Amount.

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Table 2 highlights next the trade-off between coupon and participation levels, showing the sensitivities of the principal-protected index-linked note above as an example:

<b>Maturity (years)</b>	<b>Coupon (% p.a.)</b>	<b>Participation rate (%)</b>
1	0.00	100
2	0.75 to 1.00	100
3	2.25 to 2.50	100
5	3.00 to 3.50	100

This value accumulated over the life of the security in the same way as for an asset whose repayment price is fixed in advance. As a result of the indexation the interests accrued are reinvested in the security, and this additional investment must be recorded in the financial accounts of the holder and issuer.

In the last year, the market for index-linked securities has undergone a significant evolution from traditional to modern design over recent years. There are numerous examples of composite securities which are created by intermediaries or stock or future exchanges. Examples of such asset pools consist of a large variety of mortgage or asset-backed securities, but also of stock index futures, or index participations as shown in table 3. Gorton and Pennacchi (1989) give an interesting discussion on basket securities and index-linked innovations.

<b>Financial Products</b>	<b>Features</b>	<b>Maturity</b>	<b>Potential Investors</b>	<b>Characteristics</b>
<b>Equity Index-linked Warrants</b>		1 to 4 years	private & institutional investors for speculation or portfolio insurance.	large number of index contracts, disproportional participation due to leverage effect and low capital appropriation.
<b>Index Funds</b>		unlimited	private and institutional investors	reduced transactions costs by matching separate deposits and redemptions, performance equivalent to index development, advantages from economies of scale, no stock-picking.
<b>Index Portfolio</b>		unlimited	institutional investors	high capital investment in an index-representing portfolio; no stock-picking.
<b>Index Bonds</b>		1 to 6 years	private & institutional investors	variable repayment, lower proportion on index development, fixed and regular interest income.
<b>Index Futures</b>		1 to 9 months	private & institutional investors	low capital investment, provide very liquid intraday market, low execution costs, index arbitrage into the stock market possible.
<b>Index Options</b>		1 to 9 months	private & institutional investors	low capital investment, investors have right not obligation to buy or sell index, limited capital loss, high leverage effects.

Investors feel more comfortable by holding notes linked to a diversified portfolio; they can use modern index-linked securities to simulate the purchase of an entire sector or equity index as an alternative to direct investments in the relevant market with return and cost benefits. Even in foreign markets - where risk, high volatility and high transaction costs often would not allow such an investment. Engagements in index-linked securities offer additional advantages in asset allocation to portfolio-managers pursuing a passive investment strategy but focus e.g. on alternative and emerging markets.

**Stefanie Kipp**

### **References**

- Allen, Julie A. and Janet L. Showers, *Equity Index Linked Derivatives: An Investor's Guide*, Salomon Brothers, 1991
- Das, Satyajit, *Structured Products and Hybrid Securities*, 2<sup>nd</sup> edition, Singapore: John Wiley & Sons (Asia), 2001
- Gastineau, Gary L., "Adding Value with Equity Derivatives: Part I", *Derivative Strategies for Managing Portfolio Risk*, (1993): 54-61
- Gorton, Gary and George Pennacchi, *Security Baskets and Index-Linked Securities*, NBER Working Paper No 3711, Cambridge, 1991
- Jarrow, Robert and Stuart Turnbull, *Derivative Securities*, 2<sup>nd</sup> edition, Cincinnati: South-Western College Publishing, 2000
- Merton, Robert C. "The Financial System and Economic Performance", *Journal of Financial Services Research*, 4 (1990), 263-300
- Rubinstein, Mark, "Market Basket Alternatives", *Financial Analysts Journal*, 9/10 (1989): 20-29

See also: BOND PORTFOLIO MANAGEMENT; EQUITY-LINKED NOTES/SECURITIES (ELKS); HYBRID INSTRUMENTS (OVERVIEW); INDEX ARBITRAGE; INFLATION-PROTECTED SECURITIES (IPS);

MACRO HEDGING; PORTFOLIO INDEXATION; SYNTHETIC  
ASSETS/SECURITIES; VOLATILITY: TERM STRUCTURE OF.