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Valuation of Cross-Border Mergers and Acquisitions

1. Introduction

International alliances and acquisitions are increasingly being used as an entry into new markets or access to lower cost inputs. These cross-border deals, however, are usually complex to evaluate. In this environment, our traditional methods of financial evaluation are often found lacking in determining a target's value.

An alternative approach to the valuation of mergers and acquisitions (M&As) is presented in this paper. Known as the adjusted present value (APV), it separately evaluates each component of a cross-border deal. It is shown to offer a higher degree of transparency, accuracy and flexibility in the valuation process, particularly in the context where the price of the acquisition is negotiated around a number of changing deal parameters.

In what follows, we review the recent activity in cross-border M&A and then report the results of our survey of the current valuation approaches used by M&A professionals in North America, Asia and Europe. We discuss the challenges posed by an international environment on the traditional valuation methods and conclude with a presentation of the adjusted present value method together with an example of this approach.

2. Cross-Border M&A Activity

2.1 Recent Trends and Future Prospects

Over the five years to 1990, the growth in the cross-border M&A market has far surpassed that of domestic M&As in most industrialised countries. Table 1 shows the recent evolution of M&A activity in five major world economies. The first column gives the total number of completed deals and includes both purchases by and sales of domestic firms. It reveals that cross-border M&A deals grew at an annual average rate of 57 percent between 1985 and 1989 attaining a value of $112 billion and growing to represent over one half of total M&A activity. The Table also shows separately the buying activity of firms in these countries. Thus, while Japanese firms made only 10 cross-border M&A purchases in 1985, by 1989/90 they were completing over 80 cross-border deals per year. Appendix 1 gives the same information for a larger sample of countries.

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Table 1: Trends in Number of Cross-Border (CB) M & As in Five Countries.

	1985			
	All	CB	%CB/All	Bidder CB
UK	1,193	313	26%	241
Germany	45	34	76%	16
France	35	29	83%	10
Japan	12	10	83%	10
USA	411	238	58%	44
Total	1,696	624	37%	321

	1989			
	All	CB	%CB/All	Bidder CB
UK	2,840	1,013	36%	764
Germany	1,336	651	49%	196
France	852	612	72%	344
Japan	91	89	98%	81
USA	906	756	83%	252
Total	6,025	3,121	52%	1,637

	1990			
	All	CB	%CB/All	Bidder CB
UK	2,060	831	40%	542
Germany	1,374	671	49%	192
France	1,249	649	52%	382
Japan	95	90	95%	88
USA	767	607	79%	219
Total	5,545	2,848	51%	1,423

Source: Mergers and Acquisitions Database

The slow-down in overall M&A activity that occurred in 1990 is primarily due to the early impacts of economic recession and to some extent, the wait and see attitude adopted by many companies during the build-up to the Gulf war. The UK tended to feel these impacts earlier while France and Italy retained their growth for a few months longer. Nevertheless, except in France, cross-border M&A remained at about the same proportion of total activity.

We believe, however, that this reduction is only a temporary readjustment to new market conditions such as regulatory and structural changes in France and the distractions of unification in Germany. The trend should continue to be in the direction of more cross-border M&As due to the restructuring of industry and business in Europe and the general move toward globalisation.

Acquisitions have become another major tool in corporate strategy. Many CEOs consider acquisition as the primary means of expanding their activities on a national or international scale. A survey of France's 300 top performing companies [1] showed that only 25 percent saw future growth coming from within the company whereas 75 percent expected that future growth would be achieved via M&As. Over two-thirds of that external source of growth was predicted to come from cross-border deals. Recent examples of international acquisitions are those of Jacobs Suchard by Philip Morris Co., Square D by Schneider and MCA by Matsushita.

2.2 Some Explanations for Cross-Border Growth

The increase in cross-border activity is driven both by changes in business dynamics to a more global orientation and by developments in the environment such as increased communications and general access to information.

As more companies and industries outgrow their domestic markets or look for more rapid growth in new markets, business becomes increasingly international. Many of these companies see acquisition as a better mode of international expansion than starting from zero as it brings instant market presence and knowledge. Many companies see international acquisition as a means of securing expertise or skills needed in order to compete in increasingly

sophisticated markets, such as, for example, research and development facilities for pharmaceutical companies.
Acquisitions are also a major tool in industrial restructuring. As Europe moves closer toward the dissolution of intra-European trade barriers, cross-border M&A activity will continue to grow as companies seek to establish sound positions in changing market conditions. Restructuring is not only limited to Europe, but also apparent on a world scale as trade patterns and national expertise change and develop. This is particularly so in regard to the rebalancing of the Europe-Japan-USA 'triad' economies. Barriers between national capital markets have eroded. Freer capital flows have made acquisition easier and reduced the reliance on joint venture arrangements as a means of entry into new markets.

2.3 The European Environment for Mergers

The European environment for M&A has tended to be difficult and restrictive due to differences in legislation, business practices and stock exchange operations resulting in differences in the level of M&A activity across Europe, particularly a split between the UK and the Continent. Appendix 1 contains data on the evolution of M&A activity in the major European economies. One consequence of environmental differences has been that unfriendly takeovers have tended to be rare on the Continent while the use of share links to confirm commercial relationships has become preferred to outright acquisition. Recently, however, the "rules of the game" have begun to change.

Euro-merger Regulation and Barriers

Statistics on European M&As are not usually very reliable, mainly due to the less strict corporate reporting requirements on Continental companies. Similarly, access to information on potential targets is also limited. This is just one example of the differences that make European M&As more difficult to examine.
A report prepared by COOPERS AND LYBRAND (1989) and commissioned by the UK Department of Trade and Industry, highlighted the disparity between the UK and Continental environment for M&As. Whereas the UK was said to be open, the Continent was a closed shop. This imbalance is illustrated by acquisitions such as that of Rowntree by Nestlé: foreign companies are quite free to enter the UK market but the reverse does not generally apply. The report highlighted a number of structural and technical barriers to a more open market for M&As in Europe. The technical barriers generally stem from the nature of shareholding. In Spain, France and Italy, for example, shareholdings are not disclosed and a majority of companies are either family or government controlled. In Italy, only 4 percent of companies have more than 50 percent of shares in public hands [2]. In Germany and the Netherlands a two-tiered board structure (management and supervisory boards) has led to delays in changing executive managements entrenched by old-boy style networks, and companies have relatively wide ability to limit voting rights and issue non-voting or priority shares. The structural barriers are again related to the tightly held and narrow spans of control, generally through institutions. This is particularly so in Germany where the three largest banks exercise significant power through shareholdings and supervisory board positions.
More significant, however, are the cultural barriers resulting from opposing views on the ultimate contribution of a firm to society and the role of management. In the UK emphasis is on maximising shareholder value, whereas on the Continent management's role is more to look after employees, creditors and the community. The Anglo-American style of M&As may, therefore, be regarded as somewhat unethical by a majority of Europeans.

Proposed Changes

The trend in Europe is nevertheless towards a set of transparent rules that will be applicable all over

Europe and to increasing shareholders rights (particularly the small shareholder). The European Member States handed over to the European Commission their powers to review proposed deals that would threaten competition. Deals involving companies with an aggregate European turnover of over Ecu 250 million and world turnover of Ecu 5 billion fall within the scope of the Commission, but national governments still retain power for review in relation to their national markets.
In addition to the Commission, the EC Parliament has passed a number of directives that have either been accepted or are still under review by the Council of Ministers. The directives cover such areas as the opening of company registers, share repurchases, standardisation of accounts, limitations on voting restrictions and equal treatment of shareholders. A full listing is given in Appendix 2.
A drastic change in M&A regulation in Europe should not be expected. National governments still hold power to grant exceptions and still have discretion on the implementation of EC directives. Nevertheless, we believe that these regulatory changes at the European level, forced by British agitation as well as the deregulation and harmonisation called for by European integration, will not only make cross-border M&As a simpler process, but will also result in increased M&A activity. Although Continental companies will become more accessible, it is unlikely that this change will be viewed as an invitation to the Anglo-US style of hostile takeover due to the Continental view of company purpose and the extent of family holdings.

2.4 The Asian Environment for Mergers

Asian corporates are turning the tables on the West. Previously the low cost sub-contractors, they are now buying up their former principals. What is seen as the first wave was confirmed in 1990 with the Japanese initiating acquisitions in Europe and the US. In 1989, Japanese firms completed 81 cross-border acquisitions (totalling Yen 137,304 million) rising to 88 completed deals in 1990.
The 'second wave' of M&A activity is expected to come from Taiwan, Hong Kong and Singapore as these countries outgrow their domestic markets and move into Japan, Korea the USA and Europe. Appendix 1 includes details of Asian M&A activity. Recent bear markets and the Gulf war have dampened the Asian activity in Europe and the US but intra-region M&A activity is expected to remain strong. One strengthening element is the will of Asian corporations, particularly Japanese firms, to use new financing tools, allowing them to leverage their wealth.

Reasons for Asian Awakening

One primary reason for the entry of Asia into the world M&A market is the cash rich position of many Asian corporates. After years as net exporters, with foreign investment restrictions, many companies have now built up significant wealth.
A related issue is the move by Asian companies to become global operators as they outgrow their domestic markets. As they move from being producers to sellers, Asian companies must enter the buyers markets and secure global marketing and distribution networks. The majority of the acquisitions are tactical, buying brand names and suppliers. Protecting production outlets also provides additional security to nations that are poor in natural resources.
Asian companies have been more cautious in their M&A activities internationally than the other world players. Sensitive to political and cultural differences, they are concerned about their image and the longer term effects of their actions. Now that they have gained more knowledge and established a stronger footing, however, Asian corporates in a position to launch M&A bids.
Much of the intra-regional activity is due to the development cycle within the region. Following the example of Japan, Taiwan and Korea have developed their economies along similar lines and they are now seeking the lower cost producer economies of Thailand, Malaysia and China. Indonesia

remains somewhat restricted as foreign participation is still largely limited to joint ventures.
Another influence driving M&A activity is the approval of regulatory authorities . As the region's economies become wealthier their investment focus is turning to foreign markets. For example, the Taiwanese government is encouraging investment abroad as a way to reduce the excess cash in the corporate sector and the Japanese Ministry of Finance gave its consent sometime ago by not rejecting investment proposals [3].

Restrictions on Activity

As regulatory restrictions loosen, a more prevalent issue is that of family controlled or middle market companies, similar to the system in Continental Europe. Asia has traditionally shunned the hostile, US-style takeovers and the sizable middle (and perhaps more conservative) market will continue to favour the friendly M&As. There still remain, however, a number of obstacles to cross-border M&A activity such as, for example, the Japanese system of cross-holding of shares which acts as an effective barrier to M&As.

3. Survey of Current Practices in M&A Valuation

3.1 Evaluating M&As

Key success factors

A number of surveys conducted over the 1980s have assisted in determining the key factors in the evaluation of M&As and their success. In general these show that the ability to integrate the target, a sound pre-acquisition valuation and the quality of the target's management are viewed as the key success factors.
A 1990 review by McKinsey and Company [4] of cross-border M&A programs by companies highlighted the characteristics that made cross-border M&A successful. Briefly, these characteristics are:

- targets were in the acquirer's main line of business, with an emphasis on combining value rather than immediate financial gain;
- acquirers sought strong local performers, not over-estimating their ability to turn around the target or immediately understand the foreign market;
- resources were focused on a few critical elements of the target's business systems where advantages could be created and protected;
- significant transfer of key skills occurred between the companies;
- critical systems were initially integrated by "patching" and not complex or expensive rebuilding, allowing early lessons to be learned from the target's operations;
- acquisitions were part of a program, not one-off deals.

Valuation practices

The level of sophistication of financial evaluation undertaken in M&As has been increased from its origins in international capital budgeting. Companies are becoming more sophisticated in their choice of financial evaluation methods, moving away from accounting-based methods to discounted cash-flow approaches. A 1981 study [5] of US multinationals showed that 11 percent of firms based their investment decisions on accounting rate of returns as opposed to 35 percent ten years earlier. The acceptance of cash-flow-based methods grew over the same period with 65 percent of firms using those methods as against 38 percent previously.
In 1990, we conducted a survey of M&A professionals operating specifically in the cross-border field. It was intended to obtain a clearer and more current picture of the key factors taken into account in the financial evaluation of a cross-border deal. Before presenting the results of this survey, it may be useful to first review the valuation methods and key concepts used in practice.

3.2 Review of Current Valuation Methods

The valuation technique used is related to one's view of a business. There are three possible views: to look at what a business owns, what it earns or what it will bring to shareholders. In an international setting a number of additional issues affect the value of a deal and should be considered. The key cross-border issues include international cost of capital, multiple currencies, political risk, international tax, differing accounting standards and deal structuring. The effects of each of these issues will be discussed in section 4.

Liquidation value approach

This approach is based on what the business owns, its asset sale value, and does not account for the business as a going concern. It is used when the future viability of the business is in doubt or where some disposal is envisaged but it can also provide a downside estimate of a risky business. The application of liquidation values to cross-border M&A is limited at best, primarily as acquirers are usually evaluating an ongoing business.

Market valuation: Price to Earnings ratio (PER)

Market value approaches refer to what a business earns, valuing a company as a multiple of annual earnings. The multiple or price-earnings ratio (PER) is usually that of a similar company or that of the sector.
As PE ratios are based on market sentiment and historical performance, evaluation of companies in countries with no developed financial markets is difficult. Adjusting PE ratios for currency and political risks, differences in taxes and accounting standards or for integration and other issues is difficult and subjective.
Despite its drawbacks, our survey indicates that the PE ratio still remains the most commonly used valuation approach in practice.

Discounted cash flows: The Net Present Value (NPV) and Discounted Payback Periods

Valuation based on discounted cash flows views the business as an ongoing entity and assesses its value to shareholders. Two common methods of valuation under this category are used: the Net Present Value (NPV) method and the discounted pay back period method.
According to the NPV method, an asset is worth acquiring if the present value of the net operating cash flows (NOCFs) it is expected to generate exceed its acquisition price. The present value of NOCFs is calculated with a discount rate equal to the weighted average cost of capital (WACC) needed to finance the acquisition. The estimation of an asset's NOCFs is illustrated in section 5.4 and the calculation of an investment's WACC is shown below.

The NPV of a potential acquisition, then, can be expressed as follows :

NPV = -Acquisition Price + Present Value [NOCFs]

and it is worth making the acquisition if the NPV of the potential assets to be acquired is positive (acquisition price exceeds present value of NOCFs).
eg: A potential acquisition is expected to generate a net operating cash flow of $250,000 (NOCF) per year for 3 years followed by a perpetual NOCF of $200,000 per year. The target to be acquired is in the same industry as the bidder. The bidder's cost of equity is 18% and its cost of debt 10%; the corporate tax rate is 40%. Both the bidder and the target finance 50% of their assets with debt.
The net operating cash flow will be discounted at the WACC in which the cost of debt is taken after tax. The weights reflect the relative proportion of equity and debt financing used by both the bidder and the target firm.

$WACC = (0.5 \times 18\%) + (0.5 \times 10\% \times 0.6) = 12\%$

The present value of the target's assets is [6]:

$$PV[NOCF's] = \frac{NOCF_1}{(1+WACC)^1} + \frac{NOCF_2}{(1+WACC)^2} + \frac{NOCF_3 + [NOCF_4/WACC]}{(1+WACC)^3}$$

$$PV[NOCF's] = \frac{250{,}000}{1.1200} + \frac{250'000}{1.2544} + \frac{250{,}000 + [200{,}000/0.12]}{1.4049}$$

$$= \$\ 1.786.785$$

Suppose that the target firm's assets can be purchased for $ 1,500,000 (acquisition price), what is the acquisition's NPV and should the target firm's assets be acquired?

$NPV = -1{,}500{,}000 + 1{,}786{,}785 = +\$286{,}785$

The NPV is $286,785 thus the target adds this amount to the bidder's wealth and should be purchased.

Under the NPV approach, the target implicitly conforms to the WACC assumptions which may be restrictive in all but the more simple cases. A major assumption of the WACC is that it imposes a corporate financing structure on the target which is then assumed to be constant over the time period. In addition to the capital structure, a common class of risk is assumed for the business as a whole and is reflected in the discount rate. This then assumes that the target will be subject to the average cost of funding of the investor, which is unlikely in an international situation where operating environments are significantly different. These differences are highlighted in a third assumption, that the expected effective tax rate is known. In using the WACC note should also be taken of the cost of debt. In effect, the WACC implies a risk-adjusted average cost of debt. This may not accurately value any subsidised or subordinated debt. This point is discussed in more detail in section 5.4. In general, only ad hoc adjustments are made for different financing or cash flows from different sources of risk. This is generally done through the discount rate on a subjective 'margin' basis.

According to the discounted payback period, an investment is assessed on the number of years of discounted NOCFs required to recover that investment's acquisition price. The potential acquisition is made only if the discounted payback period is shorter than that required by the acquirer for an investment of this type.

eg: Using the same figures as in the previous example, should the acquisition be made given that the acquirer requires a discounted payback period of 10 years for acquisitions of this type? The discounted payback period for the potential acquisition is about 16 years. Since 16 years exceed the 10-year cut-off period imposed by the acquirer, the acquisition should not be made. Note that the undiscounted payback period is equal to 6.75 years. This should be compared with the acquirer cut-off period before deciding whether or not to acquire the potential target firm's assets.

Capital Asset Pricing Model (CAPM)

An integral part of the NPV method is the capital asset pricing model (CAPM), used in determining the cost of equity funds. The CAPM calculates the rate of return required by the firm's shareholders as the sum of the risk-free rate of return and a premium for the market risk (also known as the beta coefficient) of equity.

$$R_e = R_f + Beta\ (R_m - R_f)$$

where: R_e = required rate of return on equity
R_f = risk free rate of return
R_m = expected rate of return on the market as a whole (proxied by a broad market index)

eg: The yield on long-term government bonds is 8%. The long-term historical rate of return on the all-ordinary stock index has averaged 16% and is expected to achieve that return in the future. A

company wishing to calculate the rate of return on equity required by shareholders has noted that the historical swings in its stock price were, on average, 25% wider than those in the index, implying a beta coefficient of 1.25 [7]. In this case, the rate of return on equity required by shareholders (which is also the firm's cost of equity capital) is:

$$R_e = 8\% + 1.25(16\% - 8\%) = 18\%$$

The beta coefficient captures the equity risk premium required by shareholders in order to hold the firm's common stock, assuming that shareholders are risk-averse and diversified.
There are a number of assumptions underlying the CAPM and Beta concepts as well as the valuation methods generally:

- Capital markets are perfect;
- Product, labour and capital markets are efficient;
- Stocks can be grouped into classes of similar business risk.

In situations where any of the above conditions are in doubt, the validity of the model should be questioned and a sensitivity analysis run on key variables.
As highlighted earlier these traditional methods do not explicitly deal with many of the issues that arise in a cross-border M&As. Accounting for them in the more flexible of traditional methods, the NPV, tends to be a process of including the parameters more as constants than variables. This requires the recalculation of the whole deal value each time one of its aspects is modified. This lack of flexibility in approaching cross-border M&As and the absence of transparency as to the components of the target value for the buyer can create an unclear position. The deal may then be lost if a source of value is left unaccounted for. Alternatively, the buyer may pay too much having failed to account for value-reducing risks.

3.3 The Euro-Asia Centre Survey

Survey Methodology

The survey was conducted by the Euro-Asia Centre in early 1990 as part of a research program aimed at understanding how practitioners are dealing with the valuation issues related to cross-border M&As. In order to elaborate on some issues, a number of face-to-face interviews were also organised.
The questionnaire that was sent to participants was divided into 3 sections: the cross-border M&A activity within the firm, the valuation methods used and specific adjustments made to reflect for the cross-border situation, and methods of accounting for political and currency risks. Each section also prompted for additional comments.
Participants targeted were both bank and non-bank advisers to companies undertaking cross-border M&As. Advisers rather than initiators of M&As were chosen due to their relative depth of exposure. Out of a sample of 78 advisory companies involved in cross-border advisory work, 38 firms returned a completed questionnaire: 10 percent from Asia, 19 percent from Canada and the USA, and the balance from Europe. The average profile of the participant firm is one having 60 percent of its M&A business in cross-border deals, operating in this area for 13 years and doing on average 31 deals per year. The average value of deals handled was US$104 million. The list of the firms from whom we received a completed questionnaire is given in Appendix 3.

Survey Results

The aggregated results of the survey are reported in Tables 2 to 6. Each sub-section commences with the question posed in the survey followed by alternative responses. The participants were asked to rate their use of each alternative as either "always", "sometimes" or "seldom".

Nature of involvement in cross-border M&A

Question:
Please specify the nature of your involvement in cross-border M&As along the following lines: Elaboration of strategy; Target screening and identification; First contact; Financial valuation; Negotiation; Financing; Contract; Integration; Others.

The answers are summarised in Table 2. Both the banking and non-banking professionals surveyed tended to be involved in the front-end stages of a negotiation. Financial valuation and negotiation were regarded as the core aspects of their job with some emphasis on screening and initial contact. Integration issues in post-acquisition were seldom identified as a key concern. This is in contrast to the key success factor rating by CEO's presented above and due primarily to the advisory nature of the participants surveyed. As the recent mega-deals of the M&A business give way to more frequent but smaller deals, advisors may shift emphasis more to the target selection and strategy functions.

Table 2: Nature of Involvement in Cross-Border M&A

	"always"	"sometimes"	"seldom"	no response
Strategy	36.8%	44.7%	18.4%	0.0%
Screening	42.1%	52.6%	5.3%	0.0%
Contact	52.6%	44.7%	2.6%	0.0%
Valuation	78.9%	15.8%	2.6%	2.6%
Negotiation	76.3%	23.7%	0.0%	0.0%
Financing	18.4%	63.2%	15.8%	2.6%
Contract	39.5%	52.6%	7.9%	0.0%
Integration	10.5%	21.1%	55.3%	13.2%
Other	5.3%	5.3%	2.6%	0.0%

Valuation methods used

Question:
In the context of cross-border M&As, which type of valuation method do you primarily use? Liquidation value(s); Market values based on PE ratios; "Theoretical" values based on (a) Discounted cash flows or (b) adjustments to the discounted cash flows; Others.

The answers are summarised in Table 3. No single method of valuation was clearly dominant over all others with around 50 percent of respondents using at least 2 measures of value in all cases. In many cases, 3 or 4 measures were used to better define and estimate the 'ball-park' target value.

Table 3: Valuation Methods Used

	"always"	"sometimes"	"seldom"	no response
Liquidation	7.9%	23.7%	55.3%	13.2%
PER	65.8%	28.9%	2.6%	2.6%
DCF	55.3%	31.6%	2.6%	7.9%
Adjustments to DCF	39.5%	39.5%	10.5%	10.5%
Other	21.1%	23.7%	0.0%	0.0%

Market valuation based on the price-earnings ratio, however, was the single most widely used method despite its shortcomings. This is no doubt due to its familiarity and simplicity. In the words of one banker interviewed, "bankers may look at the results of many methods but will always look at the PE method." The discounted cash flow valuation (NPV) was only slightly less popular. Any adjustment made for risk and other factors in the NPV approach was usually done on a case by case basis and in a seemingly ad hoc manner. This is changing as financiers with formal academic training gain influence: "... decision makers in their 50s have not been trained in using sophisticated methods such as the adjusted present value or even the discounted cash flow method."
A third of respondents also used methods in addition to those proposed in the survey although these tended to be employed more as points of reference. The methods included:

- comparable deals. A direct comparison with the price and deal structure of recent acquisitions of a similar nature. This acts as a bench-

mark of the order of magnitude of the bidder's offered value. It should be remembered, however, that the value of a target is the unique value to a bidder and is in part derived from, say, operating synergies.
- LBO value. The value placed on the target as though is was a Leveraged Buy Out situation.
- control premium. A price paid over the tangible value of the target that reflects the opportunity cost/gain of full control over the target's assets. The level of the premium is largely subjective and can invite the winner's curse. Scarcity of suitable targets was also noted as a factor in any price premium.

The use of valuation methods is always assessed on the basis of their ability to support the negotiation process and what is often desired is a more efficient technique that smooths and speeds up that process. In the views of three interviewees:
- "Valuation methods are just tools to support negotiation. The only value which really matters is the negotiated market value."
- "Papers are meant to make decision makers feel comfortable, especially when the decision making process is short."
- "As soon as we know what the acquirer really wants, we can adjust. Bankers are used to being flexible."

Valuation adjustment in cross-border M&As

Question:
When dealing with cross-border M&As do you make specific adjustments in the financial evaluation of the project for the following items: Assessment of political risk; Currency risk; International financing; Differential taxation; Others.

The answers are summarized in Table 4. Any adjustment in the valuation process was predominantly made for differences in international taxation. Tax issues tend to be more tangible in both their direct impact and ability to be integrated into a standard valuation process. These adjustments, however, are still limited, as highlighted by one interviewee: "Basic tax issues such as dividend policy are always referred to in valuation analyses. In most cases, however, more sophisticated issues such as transfer pricing are not investigated."
Political and currency risks, however, were seldom or rarely taken into account. This result most likely reflects the fact that the participants' activities mostly took place in low-risk countries.

Table 4: Adjustment for Risk and Differential Taxation

	"always"	"sometimes"	"seldom"	no response
Political risk	7.9%	15.8%	71.1%	5.3%
Currency risk	28.9%	34.2%	31.6%	2.6%
Int'l Finance	31.6%	47.4%	18.4%	2.6%
Diffential Taxation	76.3%	21.1%	2.6%	0.0%
Other	0.0%	5.3%	0.0%	0.0%

Question:
Adjustment for political risk is mostly assessed through: A "go/no-go" decision before the evaluation; The adjustment of P/E ratios; The adjustment of cash-flow projections; The use of a risk premium in discount rates; The requirement of specific payback periods; The use of local sources of financing; Others.

The results are summarised in Table 5. When adjustment was made for political factors, go/no-go decisions, usually based on expert advice, are often considered the best solution. As one banker put it, "There is no satisfying method to account for political risk. I have never correlated a discount rate with a country risk index. Go/no-go decisions along the payback period adjustments and local borrowing represent the best business solution." Adjustment was also made through the discount rate by applying a risk premium or using a foreign-based WACC. In either of these methods, however, a risk adjustment in one element of the deal (a focal point) applied to the deal as a whole.

Table 5: Adjustment for Political Risk

	"always"	"sometimes"	"seldom"	no response
Go/No-go	36.8%	28.9%	15.8%	18.4%
Adjustments to PER	7.9%	31.6%	21.1%	39.5%
Adjustments to CF	5.3%	28.9%	23.7%	42.1%
Discount Rate Premium	23.7%	31.6%	10.5%	34.2%
Required Pay-back	10.5%	23.7%	21.1%	44.7%
Local Financing	13.2%	36.8%	10.5%	39.5%
Other	0.0%	0.0%	2.6%	0.0%

Note should be taken of the fact that non-banking participants adjust for political risk more often than their banking counterparts. They also preferred to use discount rate adjusted for risk, payback periods and local financing. Cash flow adjustment was only seldom used in balancing political risk. The high no-response rate for political adjustment alternatives indicates its lack of perceived relevance or narrow definition in the participants' activities.

Question:
Adjustment for currency risk is mostly assessed through: A "go/no-go" decision before the evaluation; The adjustment of P/E ratios; The adjustment of cash-flow projections; The use of a risk premium in discount rates; The requirement of specific pay-back periods; The use of local sources of financing; The calculation of a cost of hedging; Others.

Table 6: Adjustment for Currency Risk

	"always"	"sometimes"	"seldom"	no response
Go/No-go	21.1%	10.5%	42.1%	23.7%
Adjustments to PER	13.2%	34.2%	26.3%	26.3%
Adjustments to CF	13.2%	34.2%	28.9%	23.7%
Discount Rate Premium	18.4%	57.9%	5.3%	18.4%
Local Financing	36.8%	50.0%	0.0%	13.2%
Hedging Contr.	26.3%	39.5%	10.5%	23.7%
Other	0.0%	0.0%	0.0%	0.0%

The answers are summarised in Table 6. Currency risk adjustment was most often made through the use of local sources of financing or by calculating a cost of hedging and adding this into the cash flows. It was felt, however, that hedging at an affordable cost was almost impossible; "currency risk can't be entirely hedged; one must first decide whether clients are likely to pay for it or not. This is where things get difficult". Adding a premium to the discount rate was seen as a secondary alternative of adjustment.

Concluding Comments

The survey highlights the reliance on more traditional methods of valuation in the cross-border setting and the need for a more flexible, efficient approach. These traditional methods have been developed in a domestic environment and while there is recognition that some adjustments need to be made for application internationally, this exercise tends to be somewhat ad hoc and limited. An additional point is that in applying these techniques in different circumstances, practitioners may tend to forget the limitations of the assumptions on which the models are based.

4. Challenges of Applying Traditional Valuation Methods

The international context imposes a number of complications in the valuation methods and practices that have no equivalent in the national setting. In addition to requiring specific adjustments to be made to the valuation process, the validity of the assumptions underlying traditional valuation is in doubt.

4.1 The Capital Asset Pricing Model in an International Context

Market portfolio and integration of financial markets

Central to any CAPM is the existence of a market portfolio, reflecting the systematic or non-diversifiable risk of investing. The correct definition of this portfolio is, therefore, a key to the accuracy of the model.

In an international setting, the market portfolio must contain all the securities in the world (regardless of the scope of investment), not only domestic securities. The existence of an international market portfolio, though, is dependent on the freedom of capital movement and the integration of financial markets.

In the 1980s, the barriers between the national capital markets of the major developed economies fell sharply. The abolition of exchange controls in the UK and France were two examples of this. Institutional investors now routinely allocate a part of their portfolios to international markets and empirical studies have shown that restrictions on international diversification may not negate the application of the CAPM. An international portfolio with only 20 to 25 securities can reduce the percentage of risk which is systematic by up to 20 percent compared to a purely domestic portfolio. In addition, the marginal reduction in risk as an additional security is added to the portfolio falls away rapidly beyond this number of stocks. In these circumstances, it is today reasonable to view the capital markets of such countries as being integrated. Furthermore, reliable statistics on this "international market", such as the Morgan Stanley Capital Index, are widely and cheaply available. The large majority of cross-border M&As are between developed countries, hence it makes sense to use a beta coefficient calculated with respect to this international portfolio in the valuation. This implies that the value of diversification, per se, is zero.

In cases where markets are segmented by barriers, such as exchange controls or transaction costs, the systematic risk of a project will then vary depending on the location of shareholders and the relevant portfolio becomes the investor's domestic market portfolio. This implies that there is still a diversification role to be played by companies going international and that evaluating an M&A using domestically oriented models may not be accurate.

Risk free rate

In an international context, the relevant risk free rate is the risk free rate available in the currency in which the cash flows are expressed. Thus, if the cash flows are expressed in Yen, the risk-free rate should be the yield on long-term Japanese government bonds.

4.2 Impact of Multiple Currencies and Inflation

In theory, a company's beta coefficient in the international context automatically accounts for currency risk as historical exchange rates are used in its calculation. In practice, however, an international beta is sometimes not used and cash flows are projected out in constant local currency terms, inflated and then converted into foreign currency terms. When this procedure is followed, the interdependencies of inflation, interest and exchange rates are often overlooked.

In efficient markets, the equilibrium relationships of purchasing power parity (PPP), interest rate parity (IRP) and the Fisher effect (FE) [8] tend to hold. Under this condition, there is no risk in valuation due to multiple currencies and any translation between currencies can be done using the spot rate of exchange.

If there are deviations from PPP, then the relative prices of inputs and outputs as well as relative prices within countries will change. These effects have implications for cash flow valuation and the exchange rates at which they are converted.

Deviations from PPP, however, have not been

found to be persistent or predictable. It is more likely that a firm can predict changes in relative prices based on microlevel economic activity. These changes can then be incorporated into the relevant cash flows.

4.3 Political and Economic Risks

Political risk is usually defined as the application by the host government of policies that constrain the business operations of the foreign investor. The major form of constraints are expropriation, restriction on dividends or capital repatriation. A more minor, and sometimes less obvious, cost would include government export-credit insurance.
Three factors should be considered in assessing political risk:

- The country. Country risk is usually quantified in expert risk ratings which incorporate political stability and the economic environment. These are often used in insurance analysis or go/no-go decisions.
- Economic sector. The likelihood of expropriation is higher in 'primary' industries or those in which the host government has all the means of production at its disposal.
- Deal structure. Vertical integration and technological dependence ensure that the local company will not be able to operate without the parent company's supply of parts, technology, distribution or other services. Local debt financing and high leverage usually dissuade governments from seizing assets. Joint venture arrangements with private local investors also reduce the probability of expropriation.

As highlighted by the survey conducted by the Euro-Asia Centre, there are many methods used in adjusting for political and economic risks. These often reflect the element of judgement that rests with the decision maker, the feel of the situation or the people involved.
A more systematic, and perhaps objective, approach could be to include in the cash flows the costs of insuring the equity invested in the project. A number of international insurers provide this service that, like other types of insurance, combines probability of an event occurring and expectation of loss. Similarly, decisions may be taken on net expected cash flows and compared on a go/no-go basis.

4.4 Other Issues

Preferential financing (subsidised loans)

The full benefits of financing at preferential interest rates are often not incorporated in the traditional valuation approaches. Financing is a component of the WACC and is not considered in the PER.

Specific regulation

Specific regulations and directives by the government must also be taken into account. These may include tax holidays and the use of tax havens, or capital movement restrictions.

Differences in accounting practice

Differences in the gathering and reliability of financial/accounting data will also impose a cost on the buyer. The most recent example of this is the experience with Eastern European companies.
The valuation of cash flows becomes difficult and misleading when the basis of the figures is either not clear or suspect. Under different accounting standards essential information may not be apparent. Differing interpretations of the cash flows will result in differing emphases in deal structuring.
Where accounting standards and reporting are below western standards there may also be no ready access to information about the target, its suppliers or customers. Valuations will tend to be incomplete as will any market against which to test the valuation.

5. The Adjusted Present Value Method

While the issues in international projects such as preferential financing, penalty charges or contractual cash flows are acknowledged, their special impacts on the deal are seldom taken into account. The Adjusted Present Value method of valuation does treat these factors in a more specific manner. Although the APV was introduced as early as 1974 [9], our survey of M&A professionals revealed that it has not yet been readily accepted in practice.

5.1 Principles in Cross-Border Valuation

Economic theory suggests that the value of a project is the present value of expected future net operating cash flows to the investor. The relevant perspective in valuation then is that of the parent company, the acquirer. It is necessary to adjust this for factors such as:

- local and home country taxes;
- local government controls on repatriation of profits;
- cash payments to the parent;
- royalties, management fees, transfer pricing;
- opportunity gains or losses (fringe benefits) at parent company level.

By approaching a cross-border deal in this manner, the resources the parent company invests are valued individually. In return for equity capital, a stream of operating cash flows after taxes is received whereas for debt financing, there is a stream of tax savings resulting from the deductibility of interest payments on borrowed funds. Other resources such as brand names, licences, managerial and technological know-how or proprietary components are similarly matched by streams of royalties, fees and other contractual payments.
The total risk of the deal is segmented so that it is borne by its corresponding cash flow. All cash flows (and net value) should be translated into the parent company currency.

5.2 The Adjusted Present Value Framework

The APV method is particularly suitable for the valuation of M&A deals because it values explicitly and separately each component of the total cash flow generated by the target firm's assets. The APV formula for the valuation of the target firm's assets can be expressed as follows:

$$APV = -PTA + \sum_{t=1}^{n} \left\{ \frac{NOCF_t}{(1+k_e)^t} + \frac{Dk_dT_t}{(1+k_d)^t} + \frac{D_s(k_d - k_s)(1-T)_t}{(1+k_d)^t} + \frac{CONT_t}{(1+k_d)^t} + \frac{OPPY_t}{(1+k_e)^t} \right\}$$

PTA = Price paid by the bidding firm to acquire the target firm's assets (Price Target Assets).

n = Number of years over which cash flows are projected in the future (t is a time counter from year 1 to year n).

$NOCF_t$ = Net Operating Cash Flow generated by the target firm's assets in year t. It is equal to profits before interest payment and after tax plus depreciation less capital expenditures and changes in working capital.

k_e = The target cost of equity assuming the target's assets are financed exclusively with equity (all-equity financing).

D = Total borrowing to finance the acquisition of the target's assets without modifying the acquirer's financial structure.

k_d = Corporate cost of debt.

T = Corporate tax rate applicable to the target firm.

D_s = Subsidised debt. It is assumed that total borrowing D is broken down into a subsidised loan at below market rate (k_s) and a corporate loan ($D - D_s$) at the rate k_d.

k_s = Interest rate on subsidised debt ($k_s < k_d$).

$CONT_t$ = After-tax contractual cash flows including any royalties and management fees paid by the target to the acquirer in year t.

$OPPY_t$ = After-tax opportunity gains and losses including the value of increased or decreased production in another related operation, tax rescheduling advantages and deviations from purchasing power parity, occurring in year t.

A proof of the above APV formula is given in Appendix 4. Note that total cash flow has been broken down into five separate components. The first is the present value of the target firm's after-tax operating cash flows (including all post-acquisition synergies) where the discount rate is the cost of equity assuming that the bidder's and the target's assets are financed exclusively with equity. In other words, debt financing and its implications for valuation are ignored in the first term. The incidence of debt financing (financial leverage) is captured in the second and third terms. The second is the present value of the tax savings resulting from the deduction of interest payments on the firm's total borrowing (D) where the discount rate is the corporate cost of debt (k_d). The third term is the present value of the after-tax benefit to the acquirer of getting a subsidised loan of D_s at the rate k_s where the discount rate is the corporate cost of debt k_d. The fourth term is the present value of the after-tax contractual cash flows. Since the value of contractual flows is not generally sensitive to the project risk the discount rate is the corporate cost of debt or the risk free rate depending on the degree of conservatism desired. The fifth and last term is the present value of opportunity gains and losses to the acquirer where the discount rate is the all-equity rate since these flows typically bear the same risk as those of the assets to be acquired.

5.3 Practical Aspects of the APV Method

Applying the APV method provides a more efficient valuation tool than the NPV approach. By separating a deal into its component parts, a greater level of flexibility and transparency as to what creates the value is achieved with less room for errors of aggregation. Operating cash flows are valued independently of any debt financing implications. The latter are valued separately. This is different from the NPV approach which incorporates financing and other effects in the discount rate (WACC). Each component is valued under the conditions specific to it (financing, risk, etc.). In this framework, fine-tuning of the valuation and deal-structuring becomes significantly easier.

In an acquisition negotiation it is not only speed and flexibility, but also recognition and incorporation of all the issues and the ability to make trade-offs that are essential. If in addition to being incomplete, the evaluation is also inaccurate, the likelihood of giving away too much value in a negotiation is increased.

The APV also prevents the common error of applying the same average rate of return to any new 'value components' that may be added to the deal. Under the more traditional approaches, that is, the Net Present Value, the WACC is applied to the whole firm and its combined sources of cash flows. Elements of the deal in an APV framework are added at their marginal cost or benefit (rate of return). The deal then becomes overpriced when the marginal cost of the new component exceeds the average cost of the total deal.

Finally, it should be noted that although components are valued independently, 'synergy' effects are still accounted for but as they apply to the components directly (that is, included in operating cash flow, lower cost of funds, lower discount rates, etc...).

5.4 An Example

The Setting

A multinational company, Multico, is negotiating the acquisition of a national company, Natco, in country X. Multico is faced with the following situation.

Multico : The Acquiring Company

Multico is well integrated within its industrial sector and wishes to establish operations in country X, an expected growth market. There is a competing suitor for Natco so a fast and accurate evaluation is vital. The average PER for the sector is 9.0. Should Multico finance the deal entirely with equity its cost of funds would be 15% (the all-equity finance rate) whereas the cost of equity in a project with 50% debt financing is 19.80% (see proposed solution for a justification). The average tax rate faced by Multico is 40% and the currency unit is the M$.

Natco : The Target Company

Operating in the same industrial sector as Multico, Natco has established a sound and favourable market position in country X.

Country X

Country X is encouraging foreign investment by offering long-term local loans to $300m at a preferential rate of 7% and lowering the flat corporate tax rate to 20%. The prevailing rate on long-term government bonds is 8%. The currency unit is the X$ and its current exchange rate is 2.00 X$ to the M$. A Multico economist reviewing the economic climate in X estimated a deviation from purchasing power parity of minus 5% (that is, in favour of the X$).

Combined Operations

The expected financial structure of the Natco/Multico deal is 50% debt financing with $600m long-term debt at 10% and the $300m subsidised debt at 7% offered by country X's government.
A management fee of $30m will be paid to the parent. An agreement has also been reached under which Natco will be supplied with $200m worth of components by another member in the Multico Group. This is expected to net the Group a pre-tax gain of $40m over other alternatives such as third party sourcing.
The estimated proforma Profits & Loss account for Natco's operations after acquisition (including synergies) in X$ is given in Table 7. In what follows we assume perpetual cash flows in all present value calculations.

Table 7: Proforma Profit & Loss Account for Natco (in X$)

Total Sales	1,400
Operating Costs (excluding parts contract)	(956)
Depreciation	(44)
Management Fee	(30)
Parts Contract Payments	(200)
EARNINGS BEFORE INTEREST AND TAX	170
Interest (600 at 10% plus 300 at 7%)	(81)
Porfit before Tax	89
Tax (at 20%)	(17.80)
Porfit after Tax	71.20

A Proposed Solution

Under the APV framework each of the acquisition's components are valued separately.
Natco's net operating value is the present value of Natco's after-tax cash flow from operations (NOCF) given in Table 8.

Table 8: Proforma Net Operating Cash Flow for Natco (in X$)

EARNINGS BEFORE INTEREST AND TAX	170
Tax (at 20%)	(34)
Porfit before Interest but after Tax	136
Depreciation (add)	44
Capital Expenditures	0
Change in Net Working Capital	0
Net Operating Cash Flow	180

Natco's assets after acquisition generates a perpetual NOCF of 180 which should be discounted at the all-equity financing cost of capital. As debt financing has been separated out from equity financing, it is the unleveraged or all-equity cost of equity that is relevant, that is, 15% [10]. Thus, Natco's net operating value, assuming a perpetual valuation, is:

$$PV[NOCF] = \frac{180}{0.15} = 1{,}200$$

The effects of debt financing on the value of the deal is captured in the tax-saving terms in the APV formula.

The present value of the tax benefits arising from total debt is the discounted value of all future tax savings due to the tax deductibility of interest payments. This cash-flow is discounted at the corporate debt rate (see Appendix 4):

$$PV[Dk_dT] = \frac{900(0.10)(0.20)}{0.10} = 180$$

Subsidised debt provides an additional benefits whose present value is (see Appendix 4):

$$PV[D_s(k_d-k_s)(1-T)] = \frac{300(0.10-0.07)(1-0.20)}{0.10} = 90$$

The management fee and supply contracts paid to the parent (Multico) are guaranteed contractual cash flows and do not have the same risk as operational cash flows. If the likelihood of default is assumed to be the same as that on debt, then the corporate debt rate should be used in this case, hence the after-tax cash flow to the parent company (at a corporate tax rate of 40%) on the management fee is:

$$PV[CONT_1] = \frac{30(1-40\%)}{0.10} = 180$$

The after-tax cash flow on the parts contract is:

$$PV[CONT_2] = \frac{40(1-40\%)}{0.10} = 240$$

It follows from the above that the deal's APV is (refer to the APV formula given in section 5.2):

$$\begin{aligned} APV &= -PTA + PV[NOCF] + PV[Dk_dT] \\ &\quad + PV[D_s(k_d - k_s)(1 - T)] + PV[CONT_1] \\ &\quad + PV[CONT_2] \end{aligned}$$

$$\begin{aligned} APV &= -PTA + 1200 + 180 + 90 + 180 + 240 \\ &= -PTA + 1{,}890 \end{aligned}$$

where PTA is the price paid by Multico to purchase Natco's assets.

To create value to its shareholders (APV > 0), Multico (the acquirer) should pay less than 1,890 for Natco's assets (the target firm's assets).

Comparison of APV method to other approaches

For the purpose of comparison, we also estimate the value of the deal under two alternative methods, the NPV and the PER methods.

According to the NPV method we must estimate the weighted average cost of capital (WACC) and discount NOCFs at that rate. The relevant cost of debt is, in this case, the weighted average cost of all

sources of debt used to finance the purchase of the target firm's assets:

$$k_d^w = (10\%)\left(\frac{600}{900}\right) + (7\%)\left(\frac{300}{900}\right) = 9\%$$

The relevant cost of equity is the leverage cost of equity, that is, the cost of equity that reflects the fact that the acquisition of Natco's assets will be financed 50% with debt at an average cost of debt of 9%. The correct formula to calculate this rate has been shown to be:

$$k_e^L = k_e + (k_e - k_d^w)(1 - T)\left(\frac{\text{Debt financing}}{\text{Equity financing}}\right)$$

where k_e is the all-equity financing cost of equity (15%). We have:

$$k_e^L = 15\% + (15\% - 9\%)(1 - 0.2)(50\%/50\%) = 19.8\%$$

Hence a weighted average cost of capital is equal to:

$$\begin{aligned} WACC &= (19.8\%)(50\%) + (9\%)(1\text{-}0.2)(50\%) \\ &= 13.5\% \end{aligned}$$

and the NPV of Natco's assets is:

$$NPV = -PTA + \frac{(NOCF + CONT_1 + CONT_2)}{WACC}$$

$$NPV = -PTA + \frac{(180 + 18 + 24)}{0.135} = -PTA + 1{,}644$$

where PTA is the price paid by Multico to purchase Natco's assets. According to the NPV method, in order to create a value to its shareholders (NPV > 0), Multico should pay less than 1,644. Note the difference in the estimated value of Natco's assets according to the two methods. In principle the two methods should produce the same result. But the explicit recognition of the tax benefits of debt financing in the APV approach (via cash-flows rather than the discount rate as in the NPV) and the discounting of the contractual cash-flows at the cost of debt (10%) rather than the higher WACC (13.50%) led to a higher value for the target firm's assets according to the APV approach compared to the NPV method.

According to PER method, the estimated value of Natco's assets is:

$$\begin{aligned} PER(assets) &= PERxEAT + \text{dept} \\ &= 71.2x9.0 + 900 = 1{,}541 \end{aligned}$$

There the undervaluation reflects the fact that accounting profits (EAT) under-estimate Net Operating Cash Flows (NOCF).

Value of Natco's assets in Multico's currency

Since the debt raised by Multico's to finance the purchase of Natco's assets in denominated in Natco's local currency, X$, the portion of Natco's assets financed with debt is not exposed to currency risk. Only the net investment in Natco's assets (assets-debt) is exposed to currency risk.

Using the current spot exchange rate and the estimated deviation from PPP (DEV_{ppp}) we can translate the present value of Natco's assets into M$, Multico's currency.

$$\begin{aligned} PV[M\$assets] = {} & (PV[X\$assets] - Debt)(\$X/M)(DEV_{ppp}) \\ & + Debt(\$X/M) \end{aligned}$$

Alternatively, the above can be rewritten as:

$$\begin{aligned} PV[M\$assets] = {} & PV[X\$assets](\$X/M)(DEV_{ppp}) \\ & + Debt(\$X/M)(1 - DEV_{ppp}) \end{aligned}$$

Using the value of Natco's assets estimated with the APV method we get:

$$\begin{aligned} PV[M\$assets] &= (1{,}890)(1/2)(0.95) \\ &\quad + (900)(1/2)(0.05) \\ &= M\$920.25 \end{aligned}$$

The value of Natco's assets in local currency is X$ 1,890. Their value in Multico's currency is M$ 920.25, the latter reflecting the current spot exchange rate, the estimated percentage deviation from purchasing power parity and the fact that part of Natco's assets are financed with local debt.

6. Conclusion

With the trend in business to a global outlook, companies are looking internationally to expand and develop their markets. Their preferred vehicle for this expansion is increasingly through acquisition.

The 57 percent average annual growth in cross-border acquisition over the latter half of the 1980's is evidence of the trend to global business. In Europe, the rise in cross-border M&A activity has been supported by deregulation as well as the acceptance of Continental business-people of acquisition as a 'fair' and important means of expansion. Asian companies too are seeking to expand into their buyer markets through acquisition and in Japan, Korea and Taiwan over 90 percent of all M&As in recent years have been cross-border.

As M&As become more international they become more complex. In an international setting, valuations have to incorporate different issues such as interest and inflation rate differentials between countries or the risk of political or regulatory changes that may either benefit or detract from the business.

An additional risk which must also be considered in international valuations is that the assumptions underlying traditional valuation theories are no longer valid.

In 1990, the Euro-Asia Centre conducted a survey of M&A professionals to discover the valuation techniques used in practice and the adjustments made for particular international risks, specifically, political and currency risks. The survey highlighted the reliance on traditional methods of valuation, particularly the Price-Earnings Ratio approach. There was recognition of the international issues, however, and adjustments were often made in an ad hoc manner or subjectively such as adding a premium to the discount rate.

The Adjusted Present Value approach provides a framework in which most of the complexities of cross-border financial valuation can be incorporated. The APV values each issue in the deal separately allowing for specific adjustments and conditions. While based on the same concepts as the NPV and providing a result that is not too different from that of the NPV, the APV is a more flexible tool and therefore easier to use in an acquisition negotiation. As each component is valued individually, the APV is a practical improvement on the NPV and other traditional methods. By separating the total deal into manageable units, it is more flexible in allowing new issues in a negotiation to be valued or existing issues to be quickly modified. It is also a transparent valuation technique that allows the user to see where, and how much, value is being created. Flexibility and transparency also speed up the valuation process as any recomputations will normally apply to only one item in the deal structure.

In an international setting, valuing each component in the context of the situation applying directly to it should also provide a higher degree of accuracy. The averaging of the traditional and aggregated methods is avoided.

Appendix 1: International Trends in number of Cross-border (CB) M&A Deals

1985

	All	CB	%CB/All	Bidder CB
USA	411	238	58%	44
UK	1,193	313	26%	241
Germany	45	34	76%	16
France	35	29	83%	10
Netherlands	37	31	84%	17
Italy	20	12	60%	4
Spain	20	17	85%	1
Portugal	1	1	100%	0
Belgium	12	9	75%	4
Denmark	5	4	80%	3
Switzerland	27	20	74%	14
TOTAL EUROPE	1,395	470	34%	310
Japan	12	10	83%	10
Hong Kong	15	7	47%	3
Singapore	7	5	71%	0
Taiwan	1	0	0%	0
Korea	1	0	0%	0
Malaysia	8	0	0%	0
Thailand	0	0	0%	0
TOTAL ASIA	44	22	50%	13
TOTAL	1,850	730	39%	367

1989

	All	CB	%CB/All	Bidder CB
USA	906	756	83%	252
UK	2,840	1,013	36%	764
Germany	1,336	651	49%	196
France	852	612	72%	344
Netherlands	584	339	58%	122
Italy	539	221	41%	68
Spain	268	183	68%	26
Portugal	29	29	100%	3
Belgium	264	180	68%	43
Denmark	81	63	78%	23
Switzerland	210	196	93%	157
TOTAL EUROPE	7,003	3,487	50%	1,746
Japan	91	89	98%	81
Hong Kong	31	21	68%	12
Singapore	7	6	86%	1
Taiwan	6	6	100%	4
Korea	2	2	100%	1
Malaysia	6	3	50%	1
Thailand	0	0	0%	0
TOTAL ASIA	143	127	89%	100
TOTAL	8,052	4,370	54%	2,098

1990

	All	CB	%CB/All	Bidder CB
USA	767	607	79%	219
UK	2,060	831	40%	542
Germany	1,374	671	49%	192
France	1,249	649	52%	382
Netherlands	583	318	55%	142
Italy	555	254	46%	98
Spain	348	240	69%	43
Portugal	42	39	93%	1
Belgium	235	180	77%	62
Denmark	359	151	42%	53
Switzerland	205	194	95%	158
TOTAL EUROPE	7,010	3,527	50%	1,673
Japan	95	90	95%	88
Hong Kong	29	23	89%	9
Singapore	13	9	69%	2
Taiwan	10	9	90%	9
Korea	2	2	100%	2
Malaysia	11	4	36%	1
Thailand	1	1	100%	0
TOTAL ASIA	161	138	86%	111
TOTAL	7,938	4,272	54%	2,003

Appendix 2: Directives passed by EC Parliament

Directive Number	Area of Influence
1	Company registers
2	Companies can purchase up to 10 percent of their own shares. This will soon require shareholder approval.
4	Publication and standardisation of accounts.
5	Limitation of voting restrictions.
7	Consolidation of group accounts.
13	The equal treatment of shareholders; limitation of board power to unfairly frustrate bids (through new issues or poison pills); compulsory full bid once a 33 percent holding has been acquired; and the establishment of legal review bodies. Note that recent legislation in France, Spain and Portugal support this trend requiring a bid for at least a 66 percent holding once a threshold of 33 percent is reached.

Appendix 3: Euro-Asia Centre Cross-Border M&A Survey

Company Name	Country
MASI LTD	USA
EXCHANGE CAPITAL CORP.	USA
DAI-ICHI KANGYO BANK	JAPAN
CREDIT LYONNAIS M&A	UK
WORMS & CIE	GERMANY
BARING BROTHERS & CO LTD	UK
CHASE MANHATTAN BANK	SPAIN
ARTHUR ANDERSEN & CO	UK
CREDIT SUISSE	SWITZERLAND
BOOZ ALLEN HAMILTON	ITALY
BOOZ ALLEN HAMILTON	FRANCE
ROBERT FLEMING & CO	UK
3i CORPORATE FINANCE	UK
DRESDNER BANK AG	UK
S G WARBURG & CO	UK
DEAN WITTER REYNOLDS	USA

Appendix 3: continued

Company Name	Country
FIRST NATIONAL BANK OF CHICAGO	USA
PEAT MARWICK McLINTOCK	UK
PRICE WATERHOUSE	UK
SAMUEL MONTAGU & CO	UK
MMG PATRICOF	USA
YAMAICHI SECURITIES CO	JAPAN
CREDIT COMMERCIAL DE FRANCE	FRANCE
BARING BROTHERS & CO LTD	JAPAN
PRUDENTIAL-BACHE SECURITIES	CANADA
SOCIETE GENERALE	UK
SHEARSON LEHMAN	USA/UK
MORGAN STANLEY	GERMANY
INVICO SERVICE & INVEST	SWITZERLAND
J P MORGAN	GERMANY
INTER-PACIFIC CAPITAL CORP.	USA
SIMKO EQUITIES	USA
ERNST & YOUNG	UK
SALOMON BROTHERS INTERN.	UK
HILL SAMUEL BANK LTD	UK
THE SANWA BANK LTD	JAPAN
GOLDMAN SACHS INTERN.	UK
BALANCE CORPORATION	HONG KONG

Appendix 4: Derivation of the APV Formula with Subsidised Debt

CASE 1: The Subsidised debt replaces corporate debt

There is a targeted total borrowing D which is met with two sources: a subsidised loan D_s at an interest cost of k_s and a straight corporate loan $(D - D_s)$ at an interest cost of k_d. In this case, subsidised debt replaces an equal amount of corporate debt. The relevant tax rate is T and the firm's pre-tax annual operating cash flow is OCF. The after-tax total annual cash flow to the firm's suppliers of capital (shareholders and creditors) is:

$$[OCF - D_s k_s - (D - D_s)k_d](1-T) + D_s k_s + (D - D_s)k_d + D_s(k_d - k_s) \quad (1)$$

The first term is the after-tax annual cash flow to shareholders (OCF minus interest expense on both subsidised and corporate loans). The second and third terms are the annual cash flows to creditors (interest payments) and the fourth term is the annual saving to the firm resulting from borrowing D_s at the subsidised rate k_s instead of corporate rate k_d.

Rearranging expression (1) gives:

$$OCF(1\text{-}T) + D_s k_s T + (D\text{-}D_s)k_d T + D_s((k_d\text{-}k_s)$$

The first term is the after tax operating cash flow or net operating cash flow (NOCF)

$$NOCF - D_s(k_d\text{-}k_s)\mathrm{T} + Dk_d T + D_s(k_d\text{-}k_s), \quad \text{or}$$

$$NOCF + Dk_d T + D_s(k_d\text{-}k_s)(1\text{-}T) \qquad (2)$$

To obtain the APV formula in section 4 (excluding contractual and opportunity flows), simply discount the first term in expression (2) at the all-equity financing cost of equity k_e and the second and third terms at the corporate cost of debt k_d.

CASE 2 : Subsidised debt is in addition to corporate debt

The subsidised loan D_s at k_s is in addition to corporate debt D at k_d. This scenario is different from the previous one where a dollar of subsidised loan at k_s replaces a dollar of corporate debt at k_d. In the case of additional borrowing at k_s we have the following after-tax annual cash flow to the firm's suppliers of capital:

$$NOCF + Dk_d T + D_s k_s T + D_s(k_d\text{-}k_s)$$

The second and third terms are the tax savings on interest payments on the corporate debt and subsidised loan, respectively, and the fourth term is the annual saving resulting from borrowing D_s at a lower rate k_s. The above expression can be rewritten as:

$$NOCF + Dk_d T - D_s(k_d\text{-}k_s)T + D_s k_d T + D_s(k_d\text{-}k_s)$$

by adding and subtracting the term $D_s k_d T$. This, in turn, yields:

$$NOCF + (D+D_s)k_d T + D_s(k_d\text{-}k_s)(1\text{-}T) \qquad (3)$$

In expression (3), the first and third terms are the same as in (2). In the second term, we have total borrowing which is now $(D + D_s)$ rather than just D as in case 1.
Note that in case 1 capital structure remains the same whereas in case 2 capital structure changes (more debt with either the same or less equity).

Footnotes

[1] BAIN & COMPANY (1989).
[2] MURRAY (1990).
[3] EVANS (1989).
[4] BLEEKE (1990).
[5] STANLEY/BLOCKS (1981); OBLAK/HELM (1980); SUK/CRICK/SEUNG (1986).
[6] Note that the value in year 3 of the perpetual NOCF of $200,000 per year is equal to: $NOCF_4/WACC = 200,000/0.12 = 1,666,667$, which is then discounted at the WACC for a 3-year period to obtain its value at time zero (present value of the perpetual NOCF to occur at the beginning of year 4).
[7] Note that the beta coefficient is a relative measure of risk that only captures market risk. Firm-specific risk is not considered because it is diversified away via portfolio holding.
[8] PPP implies that changes in the exchange rate and relative inflation rates offset each other. The FE implies that a nominal riskless rate incorporates a premium for anticipated inflation. Differences in interest rates may persist due to political risk however, and not offer arbitrage opportunity. IRP implies that forward/future exchange rates are based on interest rate differentials.
[9] MYERS (1974).
[10] This cost of equity is assumed to be calculated from the CAPM using a beta coefficient which is measured with respect to an international market portfolio. Thus market integration is implicitly also being assumed. As discussed in section 4.1 this assumption will be a good one for acquisitions between major developed economies. This procedure sets the value of international diversification to zero.

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