

**Airline finance and aircraft financial evaluation:  
evidence from the field**

ATRS World Conference 2005 Paper

William Gibson, AirBusiness Academy\*

Dr. Peter Morrell, Air Transport Group, Cranfield University

\* Corresponding author contact information  
William Gibson, Senior Consultant  
AirBusiness Academy  
19, av. Léonard de Vinci  
31700 Toulouse FRANCE  
+33 (0)562 121 112  
william.gibson@airbusiness-academy.com

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\* *corresponding author*

## **Abstract**

Do airlines use sophisticated measures to evaluate the benefits of their high-stakes investments in aircraft? Advanced methods are generally considered to be those which are cash- rather than accounting-based, which adjust returns for the time value of money, and which explicitly demonstrate value creation for investors and interest returns for lender. We compare the most recent findings in the general business community (from 2001) to the practices revealed in our 2004 survey of 249 airline Chief Financial Officers around the world. Substantial differences are found, particularly in the areas of risk and cost of shareholder equity estimation. Contrary to financial theory, we identify substantial interactions between the investment analysis and the way projects are financed. While we find substantial use of the more sophisticated techniques, airlines do not appear to consistently use the most advanced techniques in the market.

Keywords: Airline Finance, Investment Appraisal, Aircraft Evaluation, Capital Budgeting, Cost of Capital, Risk Management

## **Methodology**

In our recent article on the topic of airline investment appraisal (Gibson and Morrell (2004)), we discuss a series of practical problems facing companies in evaluating aircraft investments, discuss the available techniques and variations to solve valuation problems. We primarily discuss cash-based investment analysis techniques, from Net Present Value (NPV) initially proposed in the 1960s, variants of NPV to analyse the critical lease vs. borrow decision, and Real Options Analysis, a technique widely promoted by analysts and academics. The main research question raised is whether airlines use the most sophisticated techniques available.

To establish a base line of practice among financial managers, we reviewed surveys performed from the 1960s to the present day. In this paper, we compare airline practices primarily to the most recent such survey, performed by Graham and Harvey 2001).

## ***Survey design***

The following specific research questions were identified, covering the research areas of investment valuation methods, interactions between investment and financing decisions, and risk management :

### Valuation techniques

1. Do airlines use cash-based measures of investment returns?
2. Do they use advanced techniques such as Adjusted Present Value and Real Options Analysis?
3. How often do they evaluate project performance?
4. Are income taxes included in the analysis?
5. Is accounting profit + depreciation the basis for the cash-flow calculation, or do companies evaluate cash-flow directly?

### Investment-Financing interactions

6. Is there a "pecking order" in project financing decisions, ie., a preference for internal funds, debt, equity?
7. Do executives prefer debt, equity, or internal funds to finance investments?
8. Are valuation techniques used to evaluate financing decisions?
9. Is the firm focused on debt or equity project returns, or both?
10. Is the cost of equity capital based on quantitative analysis or heuristics?

### Risk management

11. How do airlines estimate risks in investments?
12. Is the perceived risk of the investment influence financing decisions?
13. What methods do they use to adjust the valuation for risk?

The questions were designed to measure the strength of preferences for the different approaches to valuation. Airline managers were asked whether they Never use (score of 0), Sometimes use (1), or Always use (2) a given technique. The preferences thus expressed are comparable to preferences expressed in Graham and Harvey (2001). The complete survey is presented in Appendix 1.

## ***Sample and response to the survey***

The airlines selected for the survey had an average fleet size of 56 planes, companies with fewer than five aircraft were excluded. 249 surveys were mailed, with a follow-up fax 10

days before the due date. To establish characteristics of the respondents, we asked firms to identify for their company:

1. ICAO region
2. Fleet size
3. Fleet diversity (number of aircraft types)
4. Total assets
5. Total revenue
6. Revenue growth
7. Majority ownership (govt, private, subsidiary, listed company)

Table 1 shows the regional composition of the sample and the response characteristics.

Regions	Airline CFOs surveyed	Responses	Response rate	Sample composition	Response composition
Africa	7	4	57%	3%	11%
Asia	58	4	7%	23%	11%
Europe	85	20	24%	34%	54%
Middle East	22	4	18%	9%	11%
North America	58	5	9%	23%	14%
South America	19	0	0%	8%	0%
Totals	249	37	15%		

Table 1: Airline CFOs surveyed and responses

We received responses from airlines in all ICAO regions except South America. The greatest response in absolute terms came from European carriers, who returned 20 completed surveys, perhaps reflecting the familiarity of Cranfield University in Europe. In percentage terms European, African and Middle Eastern airlines responded above the overall 15% response rate. This compares favourably with Graham and Harvey (2001), who experienced a 10% response rate in their survey of 4,087 companies in the U.S. Responses from South America were nil (a shame, given the 2005 ATRS World Conference venue), while only 9% of U.S. companies responded.

The responding companies tended to be moderate or high-growth, with 41% reporting annual revenue growth rates between 6% and 15%, and another 30% reporting 3 to 5%

growth. Over two thirds of the respondents operate between 10 and 50 aircraft, and six “flag carrier” sized airlines with 75 or more aircraft responded. In spite of our offer of confidentiality, many airlines responded on their company letterhead, and many asked to receive the survey results.

Graham and Harvey (2001) point out that 8-10% is a usual response rate to surveys about company financial practices, which in many cultures is quite sensitive. Our 15% response rate yields a statistically significant 37 respondents. While we can see relations between individual airlines characteristics (size, growth et c.) and their preferences for various techniques, the relatively small number of airlines operating more than five aircraft (and our 15% response rate) preclude the use of correlation of preferences against the airline characteristics. In this sense, the survey is similar to an interview approach: our 37 responses allow us to draw broad conclusions about preferences, particularly descriptive of European carriers. Response bias may well be present, since the respondents quite probably represent more sophisticated and/or financially transparent airlines compared to the norm. We are careful in this paper not to “over-conclude” given the limited respondent population: additional surveys and interviews covering why various practices are used and how they fit into the investment appraisal process will help round out the picture.

For each aspect of valuation, we review recent academic surveys of financial managers, to establish the trends in valuation practices over the last thirty years, as background for our airline survey. Most of these surveys were performed in the United States, where broad and deep financial markets are accompanied by substantial theoretical research and recommendations for managers.

### ***Investment valuation practices and trends***

The predominant question is whether managers should focus on accounting profits or cash returns in evaluating projects. Financial theory has evolved clearly in the direction of cash-based techniques, which are taught in Masters’ programmes in management throughout the world. Most surveys of theory and practice since 1970 were performed in the U.S., which has the advantage of a providing very large sample basis for surveys. U.S. corporations are clearly found to have tended toward more toward cash-based investment appraisal techniques, while retaining a variety of methods to gain insight into project characteristics.

A second key question is whether firms explicitly adjust for the time value of money. Probably the oldest and most intuitive method for evaluating investments is simply calculating the time it takes to recover the investment, known as the payback period. This method is commonly used to evaluate small investments such as office equipment, but what is its current usage in the massive investments required by airlines? Theory suggests that an appropriate valuation method is to discount each year's cash flows to account for the time value of money. On the other hand, payback calculations are persistently found in use from 1970 to the present day, often in combination with more sophisticated techniques. This begs the question of the role payback plays in the investment appraisal. Several authors suggest that it is a heuristic method of incorporating real options, a highly complex and quantitative valuation method, into the investment analysis.

The most recent and the broadest survey of investment practices was performed by Graham and Harvey (2001). All Fortune 500 companies, as well as 4,400 members of the Financial Executives Institute, a professional association, received questionnaires. Since there was some overlap in the two groups, a total of 4,087 surveys were sent. A team of 10 MBA students at Duke University followed up with telephone and faxes to maximise the response rate, which came in at 392 completed surveys, a 10% response rate. Graham and Harvey point out that such surveys reflect beliefs rather than proving practices. On the other hand, such a high number of responses allowed a high degree of statistical reliability in the testing of several hypotheses and correlations.

The authors cite earlier surveys such as Schall et al. and Oblak and Helm, but also Moore and Reicher (1983), Bierman (1993), Trahan and Gitman (1995), which tend to confirm that the vast majority of U.S. firms use some sort of cash-flow analysis to evaluate investment projects. The Graham and Harvey survey goes beyond these and the earlier surveys discussed in this paper to inquire about the use of two additional techniques for calculating returns: Adjusted Present Value (APV) and Real Options Analysis (ROA), methods discussed in Gibson and Morrell (2004). Additionally, they investigate the "Price-earnings multiple (PER)" approach, similar to that discussed in Mao (1965), a technique that focuses on accounting profits per share of common stock, rather than cash flow.

Graham and Harvey's survey results show a clear preference for cash-based measures, with IRR and NPV being the dominant measures used, followed by PER. Slightly over 20% of executives in the survey use Accounting Rate of Return (ARR), far lower than the 58% found

by Schall et al. survey of 1978. More common is the use of the PER. Consistent with the earlier studies, the authors find a clear tendency to use more than one method to evaluate projects. NPV has pulled even with IRR among cash-based measures, presumably facilitated by advances in the knowledge of techniques to estimate cost of capital.

Table 2 shows the percentage of firms that “almost always or always” use the techniques:

Methods used	Percent using the method
IRR	75.61%
NPV	74.93%
PBK/Discounted PBK	56.74%/29.45%
PER	38.92%
ARR	20.29%
ROA	26.59%
APV	10.78%

Table 2: Methods used by US companies in 1999 survey (Graham and Harvey)

The large sample size allows the authors to test the use of various techniques against several CFO and firm characteristics. They assign a “preference rank” for each technique. The survey allowed choices of never use, sometimes use and always use, on a scale of 0 to 4. Scores above three indicate a very common use of the method. The differences between scores are tested at a 1%, 5% and 10% significance level. Grouping IRR/NPV as Cash-based, PBK and PER as Accounting-based, the following pattern emerged at the 1% significance level.

Methods preferred	Cash-based	Accounting-based
Large firms		
Leveraged firms (high level of debt)		
Firms that pay dividends		
Manufacturing firms		
Management ownership low		
CEO older than 59 years old		
CEO tenure long		
Regulated		
CEO holds MBA		
Widely-held corporation		
Foreign sales		

Table 3: Type of companies using cash vs. non-cash measures in 1999 survey (Graham and Harvey)

The authors find that firms with older, longer-tenured CEOs showed a preference for accounting measures, implying that the cash-based techniques taught in MBA programmes are more up-to-date. These preferences do not indicate that the firms preferring cash-based measures don't use the accounting-based measures as well, but rather, that they more



commonly use cash than accounting-based calculations. It is worth noting that ARR received scores of less than 1.5 in all categories, while PBK and PER tended to score above 2.5: clearly, ARR has become much less frequently cited by U.S. financial executives, since the 1978 Schall et al. survey.

Among the control variables, the most relevant for our research into airlines are the ownership structure, level of debt, and degree of regulation. Airlines – particularly those in emerging markets - are often state-owned (see Gibson and Morrell 2004), often highly indebted, and the sector is heavily regulated compared to other service industries (such as hotels, for example), in most countries. If the airline sector follows the patterns identified by Graham and Harvey, we would expect to observe a preference for cash-based measures.

### ***Use of NPV in high-growth emerging markets***

Pinches and Lander (1997) suggest that the whole question of appropriate capital budgeting techniques should be re-opened when looking at “newly industrialised and developing countries” such as South Korea, Taiwan, Singapore, and India. The authors conduct thirty formal interviews with company managers, as well as informal interviews with “government officials, development officials, and professors knowledgeable and interested in capital budgeting.”

They find that NPV is not used by the companies, although the managers interviewed are familiar with the technique. Rather, they appear to prefer PBK and ARR to NPV, citing the difficulties in the process of estimating cash flows as a primary source of concern with NPV.

In addition to methodological concerns, the authors identify four broad reasons for the rejection of NPV

- Firms are pursuing strategic goals such as seizing “now-or-never opportunities,” building market share, or substituting capital for labour override preclude a purely financial evaluation, and this in markets which are higher-growth and more volatile than more mature markets such as the U.S.;
- Government incentives for investments, such as tax credits, cheap financing, and land grants can override market-driven economics;
- Banks are very influential in the decision to invest or not, and commonly “the initial standards used by firms in all these countries were dictated by the banks”;

- Company founders tend to make decisions more intuitively, relying less on formal analysis and quantification of results, and are less risk-averse than professional managers.

The authors suggest that in these markets, more dynamic methods of investment appraisal such as Monte Carlo and Real Options Analysis are appropriate tools than ‘static NPV.’

These business practices suggest that the appropriate investment appraisal techniques in these markets are very much subject to governance questions such as government and bank influence, as well as the ownership of the company and the attitudes of company founders and managers pursuing long-term strategic goals, overriding rigorous financial analysis. In countries where the ownership of companies is widely held, such governance questions are addressed in financial terms by properly estimating the cost of capital.

**Valuation techniques in airlines**

We asked airline CFOs were asked to state which techniques were used to analyse investments, choosing from a list of six common metrics (PBK, ARR, IRR, NPV, APV, ROA, as well as Economic Value Added (EVA)).

They were asked to state preferences for the various techniques as never use, sometimes use and always use, assigning scores of 0, 1, and 2 to each respective preference. A score of 1.5 indicates a strong preference for the method; while any score under .5 indicates a method that is rarely used. The resulting scores are directly comparable to Graham and Harvey (2001).

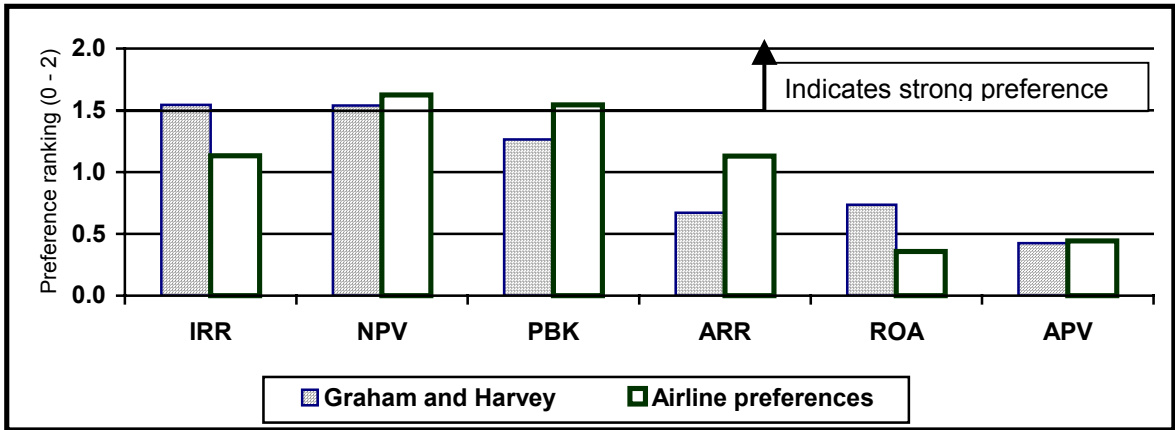


Figure 1: Preferences for valuation techniques in Graham and Harvey (2001), Gibson and Morrell (2005)

We see both similarities and differences from the Graham and Harvey study. Airlines indicated a strong preference for Net Present Value, and weaker preference for Accounting-

based ARR than for the cash-based techniques, a result consistent with trends observed in the literature survey. On the other hand, airlines indicated a stronger preference for PBK compared to Graham and Harvey, and a weaker preference for use of IRR. Airline managers expressed a significantly more common use of Accounting-based ARR than in Graham and Harvey, perhaps a sign of conservatism in the industry.

Concerning the advanced techniques, the airlines responding showed a very weak preference of both Real Options Analysis and Adjusted Present Value. The former appears far less frequently used than in the general business community, as only 21% said they used ROA, compared to the 25% found by Graham and Harvey. This surprising, given aircraft manufacturers’ extensive use of purchase rights, delivery options and aircraft family conversion options. Real Options valuation of these aircraft options is discussed in Gibson and Morrell (2004). The common criticisms levied against ROA is that it is difficult to explain, rather theoretical than practical, and that data are difficult to obtain.

Financial managers were found in our survey to prefer using more than one technique to analyse investments. Responses indicate that airline managers tend to use between two and six different valuation techniques, with a central tendency (mode) of four techniques used. This confirms earlier research showing that financial managers prefer to balance techniques against one another to get a complete picture of investment dynamics.

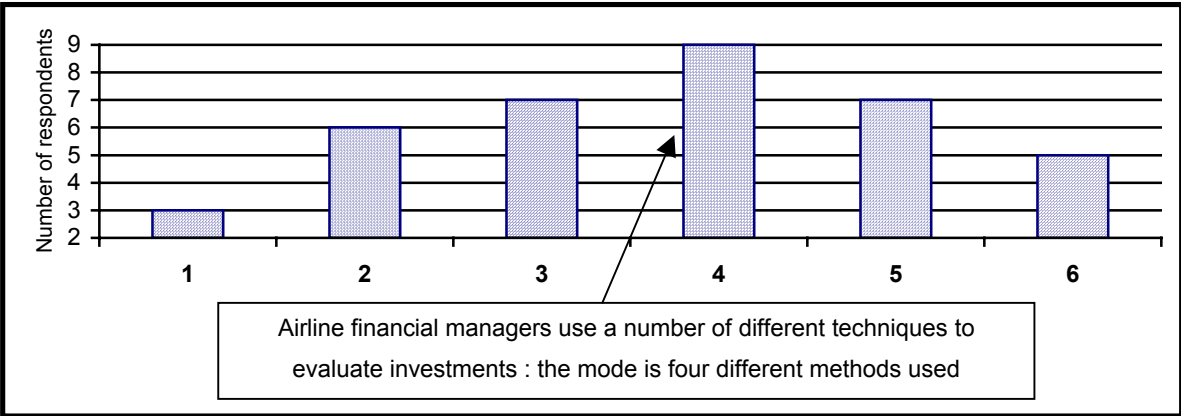


Figure 2: Number of different valuation techniques used to evaluate airline investments

Looking deeper at the use of multiple techniques, airline managers indicated that fully 43% always use both NPV and PBK, and another 32% sometimes use both metrics, representing an overall 75% preference for using these methods in tandem. Interestingly, the cash flow pattern of PBK and NPV can be represented on a single graph. The cash flow patterns for an

investment in a single-aisle aircraft operating in Europe and sold at the end of year six of operation is depicted below.

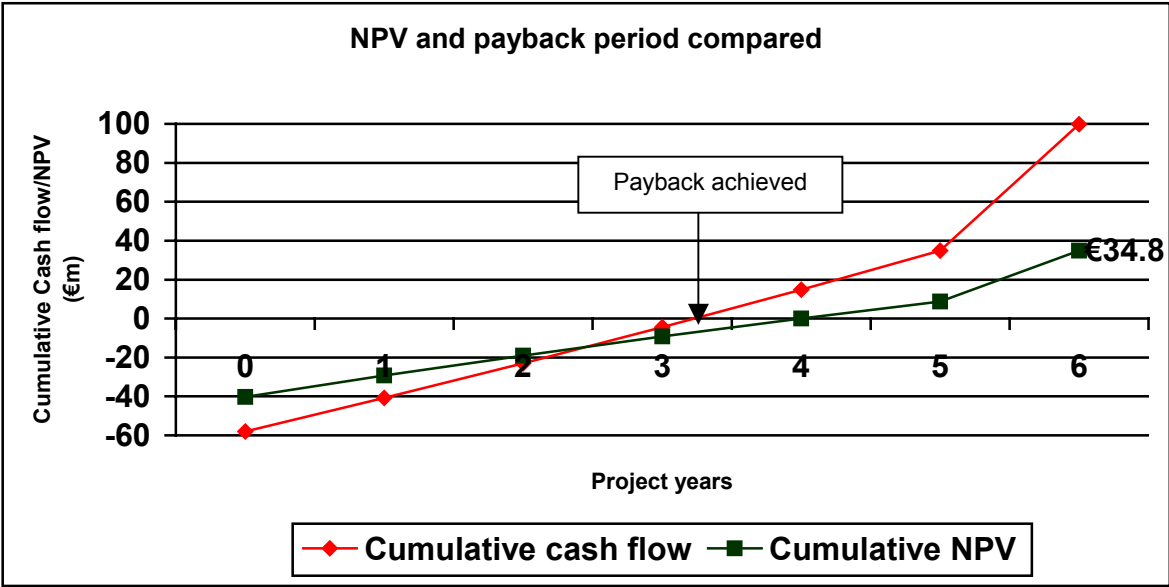


Figure 3: NPV and PBK depicted graphically

The graph reveals that payback is achieved during year four, when the company recovers its cash invested in the aircraft, while the NPV reaches its total of €34.8million at the end of the project, after turning positive in year five. These complementary measures can be seen as measuring the risk (PBK-how long is the Treasury position negative) and the return (NPV) in a common visual framework.

McDonald (1998) and Alesii (2003) suggest that heuristic measures such as PBK may in fact approximate the conclusions of valuations using more sophisticated techniques such as ROA. Of course, our survey merely asked which techniques were used, not why they were used, so more research is needed to determine the reasons airlines adopt various techniques.

Looking at regional preferences, we find the strongest preference for NPV in the Middle East and Asia (1.75 of a possible 2.00 preference ranking). Airlines in these regions showed an equally strong preference for PBK. NPV showed slightly lower preferences in North America (1.67) and Europe (1.61). IRR is still in common use in the Middle East (1.75), where share markets are less developed than in other regions and statistical cost of capital estimation is difficult. In the other regions of the world, IRR showed a preference ranking of only 0.98. Consistent with the existence of broad and deep share markets and the corresponding ease of estimating the cost of capital for NPV calculations, U.S. respondents showed the lowest preference for IRR, at only 0.75.

The other questions regarding project analysis practices yielded the following patterns.

- A majority (60%) of airline managers perform investment analysis for all investment projects, while an additional 30% analyse projects with over a certain size, commonly \$100,000. Only 3 responding managers indicate that they analyse projects according to risk class.
- A common criticism of NPV is that joint revenues and costs of different aircraft operating on the same routes, and the specific cash-based accounting required, make it difficult to follow up on results after the project is launched. Among our airline respondents, a large majority (81%) follow up to measure project results in some way, with a full 65% looking at results at least annually. Another 18% measure results at the end of the project.
- 68% of airline financial managers prefer to calculate cash flow directly, rather than begin with profit and add back depreciation. This is quite possibly driven by the advances in spreadsheet technology, which greatly facilitate such modelling.
- A less clear preference was cited for after-tax analysis recommended by analysts and academics. 35% of airline managers report using after-tax analysis, while 32% do the analysis pre-tax, and the rest declined to respond.

## **Cost of capital estimation**

Most of the cash and accounting-based capital budgeting techniques reviewed in the literature require an estimate of the required return on investments, calculated as a percentage. In the case of ARR, the percentage is calculated as profits over average investment, while NPV calculates the cash value created over the project, using an explicitly calculated cost of capital to deduct the required rate of return in each period. The output of IRR is a rate of return, which can be compared to a required rate (often referred to in practice as the ‘hurdle rate’) for investment returns.

Companies financing themselves in mature markets such as the U.S. and Europe have the advantage of large public securities markets for listing company shares and debt obligations on open exchanges. In these markets, statistical estimation methods based on historical data are commonly used to estimate an acceptable financial return – or cost of capital - for investment projects. On the other hand, there is significant doubt as to the usefulness of these purely statistical approaches for firms which are thinly traded, or closely held by governments, other companies or families, which often characterise airline shareholding. As

with investment valuation techniques, the literature reveals that executives prefer to use a combination of different approaches to arrive at a proper cost of capital. These include both objective/market-based and subjective/heuristic methods.

In the business and academic literature, the recommended method for estimating cited is the weighted-average cost of capital (WACC). Surveys performed in the general business community since the 1970s showed a clear trend toward use of this measure, which is also become popular through “Value-based management” metrics such as Economic Value Added.

The Campbell and Harvey survey goes deeper into the methods used, explicitly asking whether firms use the Capital Asset Pricing Model (CAPM) to estimate the cost of equity capital. Under CAPM, historical share market returns on the firm and the market are used to estimate expected returns in the future, yielding a Beta coefficient that measures the specific risk (and therefore expected return) for a particular share. A Beta of greater than 1.0 means the share is more volatile than the market overall, driving a higher expected return for the share.

Implicit in the Graham and Harvey focus on equity returns is that cost of debt is relatively easy to ascertain for a WACC calculation, with bond yields and bank interest rates being readily available inputs to the calculation. Cost of equity is a far more difficult figure to estimate, as different investors in the same company may well have a variety of expected returns on their investment.

Campbell and Harvey find that 73.5% of respondents use CAPM to estimate cost of capital, another 39.41% used average share market returns (i.e., without adjusting for the risk of their company), while 34.29% used the dividend discount model to estimate cost of capital. Notably, they discover a very strong preference for CAPM among large firms which, in the U.S., tend to be listed on major share exchanges. Similar to the findings in earlier studies, the use of multiple techniques suggests that managers prefer to weigh up several alternative measures to arrive at an appropriate cost of equity.

### ***Airline cost of capital estimation issues***

Turner & Morrell (2003) analyse 10 airline beta values, revealing several pitfalls of CAPM for calculating expected returns. The authors begin with the observation that different

financial information services report substantially different betas for the same airline on the same date. Further, the two of the three services report an average beta of less than 1.0 for the airlines examined, suggesting that these airline shares are less volatile than the market as a whole. This runs counter to the view that airlines are subject to both highly cyclical demand (particularly in high-margin business class), and broad volatility in input prices, notably jet fuel, and hence should generally have beta values significantly higher than 1.0 (see for example, Morrell (1997)).

Noting that the CAPM expresses the share returns as a linear equation, they perform a regression analysis on four different methods of calculating airline betas, to determine goodness of fit of CAPM, using  $R^2$  as the measure of fit. In most cases, the methods of calculating annual returns calculated month-to-month over the past 60 months, and daily returns over the past year, yield better fits than other methods. However, the authors point out,  $R^2$  varies from a minimum of .001 for Southwest Airlines, to a maximum of .870 for Singapore Airlines under the former method, and from .0125 for SAS to .401 for Singapore in the latter. CAPM statistical validity was widely variable in the airline industry, during the years 1996 – 2002.

The authors conclude that the cost of equity, a key input to the WACC calculation and hence to NPV calculation (or hurdle rate determination), is itself subject to broad variation, and that CAPM generates results which are, for many airlines, of doubtful statistical validity.

The WACC and CAPM methods of calculating cost of capital are widely used in U.S. industry, with its broad and deep securities markets and tradition of public listing of company shares on open exchanges. On the other hand, there is significant doubt as to the usefulness of these purely statistical approaches for firms which are thinly traded, or closely held by governments, other companies or families, which often characterise airline shareholding. As with investment valuation techniques, the literature reveals that executives prefer to use a combination of different approaches to arrive at a proper cost of capital. These approaches include both objective/market-based and subjective/heuristic methods.

### ***Airline cost of capital estimation***

We asked airline managers about preferences among four methods of setting the discount rate, cost of debt, cost of equity, WACC, and a rate based on the project financing. Overall, the managers expressed a distinct preference for WACC as a discount rate, followed by cost

of debt. The former indicates a balanced view between shareholder and lender expected returns, while use of cost of debt may indicate that NPV analysis is used to justify projects to banks, that the cost of equity is considered nil because the company is a public service owned by the state, or both of these. As Figure 4 shows, the preference for cost of debt is nearly 1.5 in the Middle East, with lower but still significant preferences for this measure elsewhere. The preference for using the (higher) cost of equity finance is very low among these respondents. On the other hand, companies in the Middle East, Asia and Africa sometimes or often set a discount rate directly related to the project's financing, pointing toward significant investment-financing interactions, discussed in the next section.

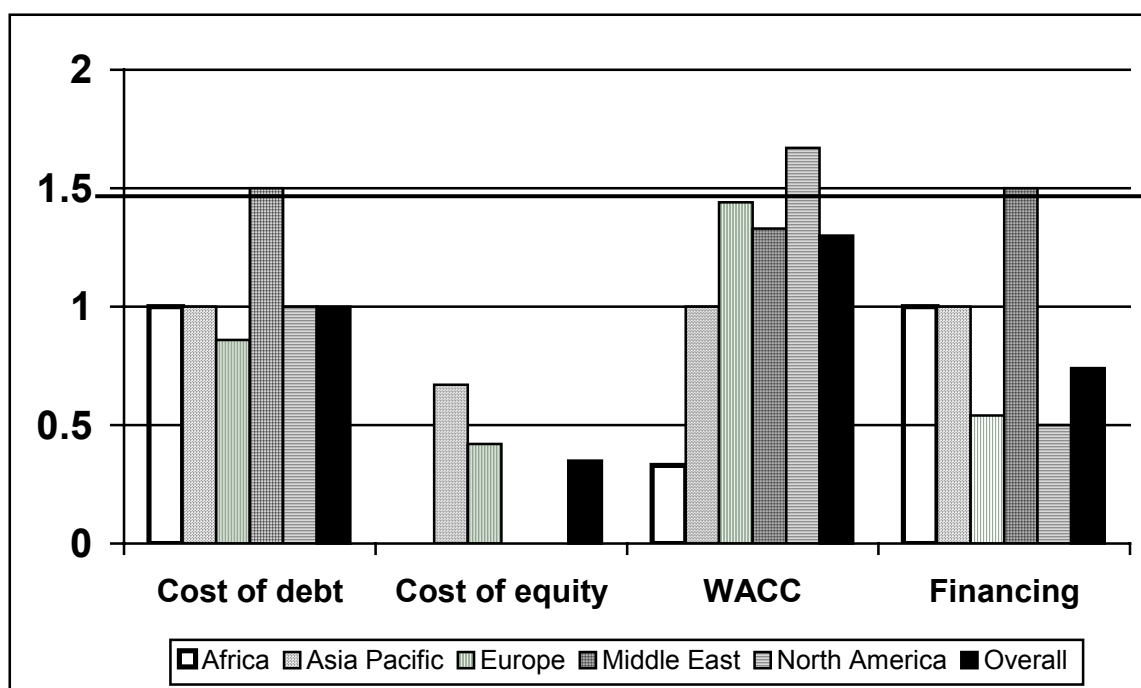


Figure 4: Airline preferences for cost of capital estimation

Cost of equity is an important input to a WACC calculation, and yet airline managers did not express a strong preference for any estimation method (Figure 5). Graham and Harvey identified CAPM as the preferred method, reflecting U.S. financing market practice. Our global airlines respondents expressed moderate preference for this method, and equal preference for measures based on “experience,” or heuristic methods, a technique not mentioned in Graham and Harvey.



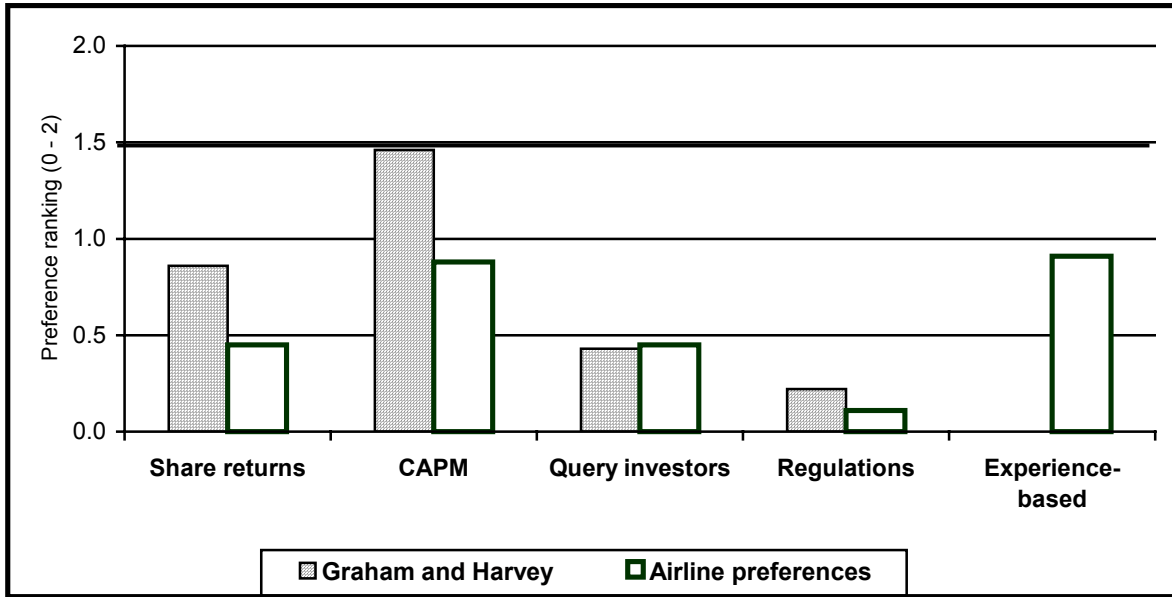


Figure 5: Airline preferences for cost of equity estimation

The strongest use of experience-based measures is in the Middle East, where no use of CAPM was reported. Government requirements and regulations for returns to investors, the primary method used during the days of airline regulation, apparently has an impact only on the Asian respondents, and there only weakly. Consistent with Graham and Harvey's findings, preference for CAPM is very strong in the United States, and weaker but still significant in Europe and Africa.

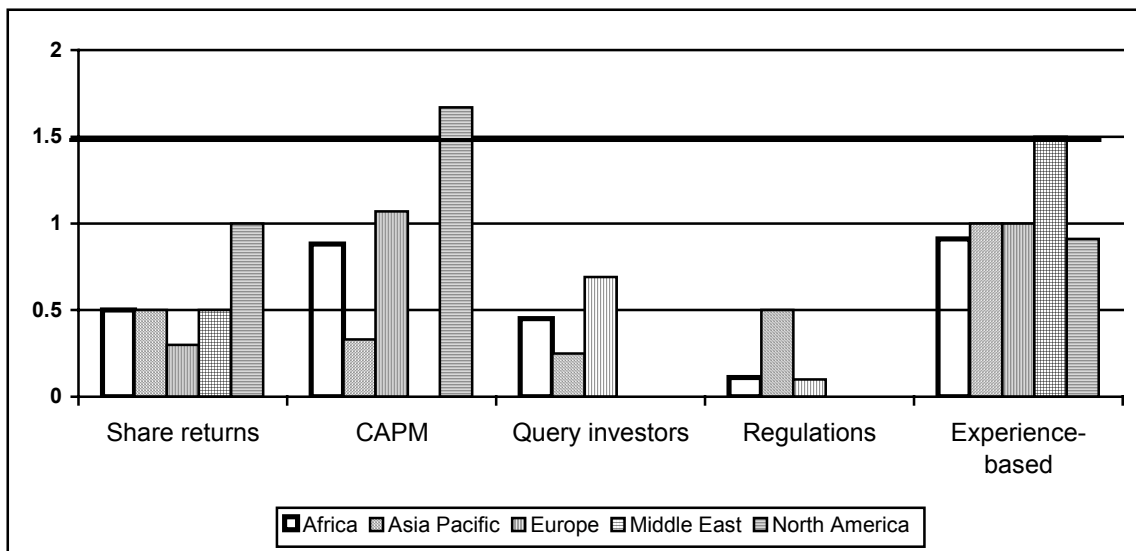


Figure 6: Regional preferences for cost of equity estimation

## Investment-financing interactions

In traditional finance theory, investment and financing decisions are kept separate. Under this approach, companies evaluate investments using a “theoretical” cost of financing, and separately optimise the financing. The classic Modigliani and Miller Propositions I & II postulate that returns on investments in companies are independent of the way the firm is financed, since shareholders can duplicate any debt financing for themselves. Proposition II softens this stance by recognising the benefit of interest tax deductions, but the bias against including financing cash-flow remains. In the airline industry, companies often combine the two decisions, but do they do so in an appropriate fashion?

While it is clear from the research that there is convergence in the business community in mature markets on a set of techniques, there is substantial evidence suggesting that in today’s fastest-growing emerging markets, many of the basic theoretical assumptions about financial markets that underline valuation and cost of capital calculations may not hold true. For this and other reasons that are explored in the literature survey, players in many dynamic markets may have different methods of evaluating investments, compared to those found in mature markets such as the U.S. and Europe. Specifically, authors writing on these markets find there may be significant interactions between investment valuation and the way the firm is financed, a point not specifically or satisfactorily addressed in the classic literature on investment appraisal.

In spite of the theoretical preference for evaluating investments independent of the specific financing used for the project, there is considerable evidence of interactions between investment analysis and financing. The managers interviewed by Pinches and Lander (1997) state that when NPV is used as a measure of financial performance, “more often than not the discount rate used was the cost of debt.” This finding is consistent with the important influence of banks in the investment decision process: banks are primarily concerned with recovering their loan capital, not with company profitability.

Use of WACC implies that firms have a target capital structure (debt/equity ratio), allowing them to systematically compensate creditors and shareholders in evaluating investment projects. Conversely, use of cost of debt as a discount rate implies that compensating banks is sufficient financial justification for investments for the firms interviewed by Pinches and Lander.

Booth et al. (2001) also suggest that financial decisions in developing countries may influence the way firms analyse investments. They investigate capital structures in ten developing countries for clues as to why this might be so, and discover major differences from developed countries. First, in developing Asian countries such as India, Malaysia and Pakistan, companies rely much more on short-term debt than in developed countries, including South Korea, the U.K. and the U.S.

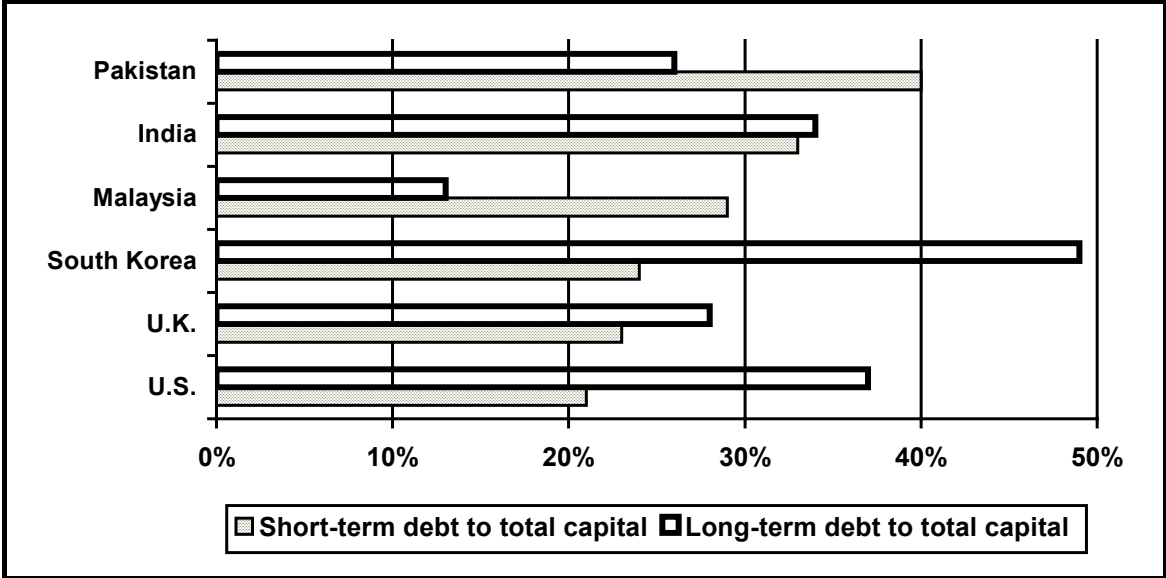


Figure 7: Short- and long-term debt in company capital structures in Booth et al., 2001

Figure 7 shows only emerging-markets in the same region as Pinches and Lander study: Booth et al. find that in countries such as Mexico and Brazil, the reliance on short-term borrowing is even more pronounced. While this difference does not in itself prove that WACC is not a valid measure of the company’s cost of capital, it does point up the possibility that financing arrangements can significantly alter their investment valuations. Under WACC, the debt in the capital structure is long-term debt, used to finance long-term investment projects. If firms cannot or do not raise significant long-term borrowing, WACC may well be considered an inappropriate measure of the firm’s true cost of capital.

***Equity ownership and investment valuation***

LaPorta et al. (1999) observe the 20 largest firms in each of 27 ‘wealthy’ countries, and group ownership structures into three broad categories, widely held (traded on bourses), Family controlled, and State controlled. Looking (for comparison to the other studies surveyed) at countries in Asia, broad differences in control, defined as a minimum 20% shareholding by one group, are found.

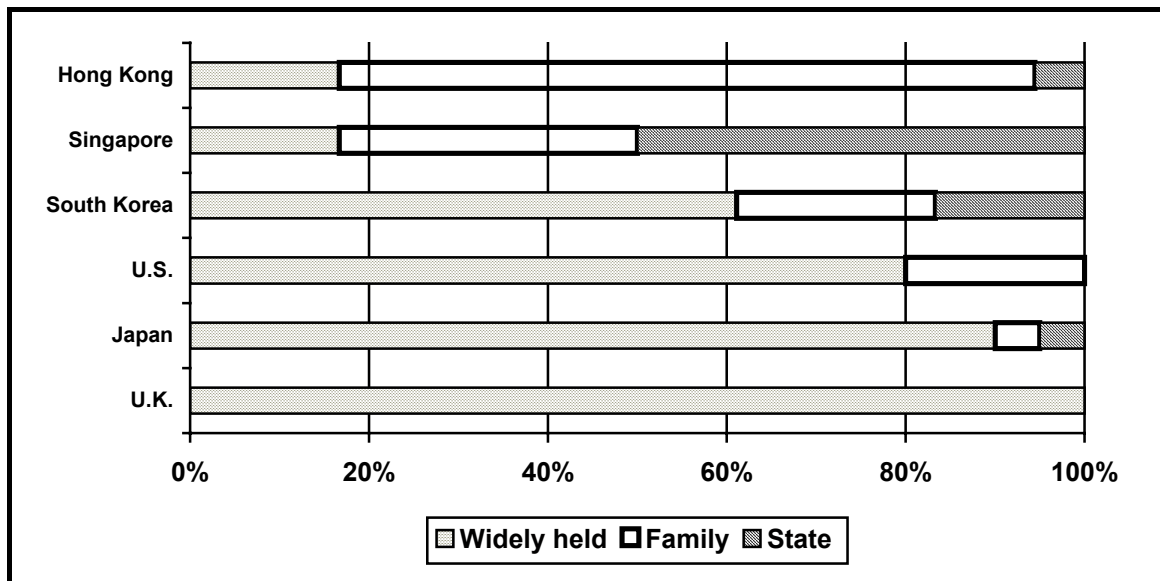


Figure 8: Company ownership structures in LaPorta et al., 1999

While in the U.K., the U.S. and Japan broad share ownership is the rule, families control significant numbers of large companies in Hong Kong, Singapore, South Korea and the U.S. Pinches and Lander find that founder-controlled firms use more intuitive techniques to evaluate investments, and are less averse to risk than professional managers.

LaPorta et al. find a significant positive relationship between the number of widely held firms and the level of minority shareholder protection under the legal systems of the various countries.

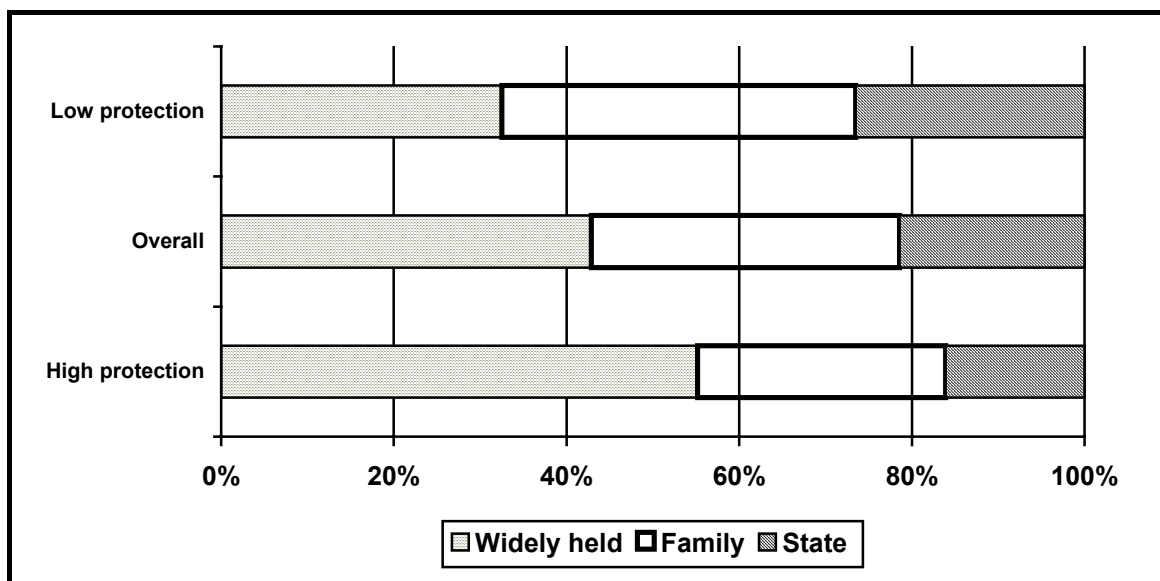


Figure 9: Company ownership structures in LaPorta et al., 1999

The authors find a pattern of family and state ownership in countries where small shareholders are not well-protected (including Hong Kong and Singapore), and a majority of firms widely held in countries where minority shareholder protection is strong.

***Airline financing and investment biases***

Airline financial analysts never tire of saying that the airline industry suffers from chronic over-capacity. In a competitive market, the use of artificially low discount rates in NPV calculations would encourage companies to over-invest. Turner and Morrell (2003) suggest that the estimates of cost of capital using CAPM may be distorted (specifically, that beta may be understated) in the case of airlines that have a significant shareholding not traded on the market. They note that for example Singapore Airlines is 56.8% owned by Temasek Holdings (a state-owned holding company), Cathay Pacific is 45.8% held by John Swire and Sons, Finnair is 58.4% state-owned, and 50% of SAS is controlled by the Danish, Norwegian, and Swedish governments.

In Figure 10, we compare the shareholding pattern between Gibson and Morrell (2004 – left hand graph), and our survey respondents (right hand graph).

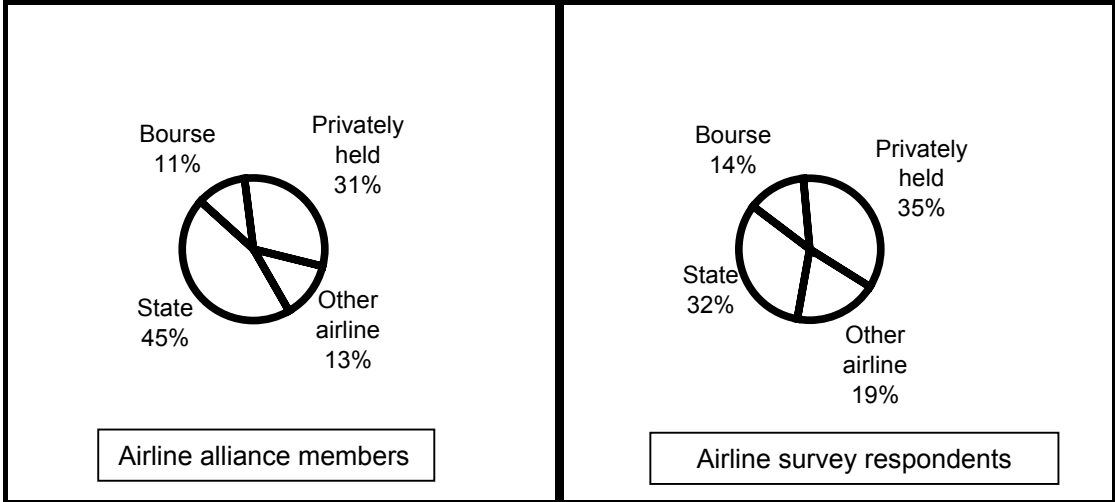


Figure 10: Majority ownership of the world's airline alliance members (left), and our airline survey (right)

Our respondents tend to be more in private hands than the overall airline population, whether they are owned by another airline (19% vs. 13%), private investors (35% vs. 31%), or listed on share exchanges (14% vs. 11%). Still, the use of cost of debt or project financing discount rates, and the somewhat fuzzy lack of preference for a method of estimating cost of equity, tends to point up the possibility that airlines may be under-estimating their true cost of financing. This could - at least theoretically - lead to over-investment, particularly when a

public service approach to financing (zero cost of equity) is used to analyse investments in a market with the enormous competitive pressures faced by airlines.

Our airline survey shows that there are clear interactions between the investment analysis and the financing preferences. This is confirmed by the extensive preference for using cash flow analysis to evaluate the critical lease vs. purchase (or lease vs. borrow) decision in aircraft financing: only one airline manager responded that the company never did so. As discussed in Gibson and Morrell (2004), improper discount rates used to evaluate leases could also encourage companies to take on more aircraft than they need. More detailed research is needed to determine whether the analysis may encourage overinvestment. The airline managers also responded with a moderately strong 1.37 preference for using cash-flow analysis to evaluate the use of internal vs. external financing, another clear link between the investing and financing decisions.

When looking to finance projects, our airline CFOs ranked their preferences. They indicate the following ranking:

1. Use internal funds
2. Minimise cash out (for example, through operating leases)
3. Debt financing
4. Equity financing

These preferences confirm the moderate support for the Pecking Order theory of financing choices found by Graham and Harvey (2001). In this theory, excessively high financing costs caused by information asymmetries between managers and investors encourage managers to avoid equity financing.

Finally, we asked our financial managers about their overall preferences for debt vs. equity financing (capital structure) for the airline. 59% of our respondents we found to have flexible target capital structure, with the remainder split equally between a strict target and no target. An broad array of preferences or determinants of debt levels was expressed.

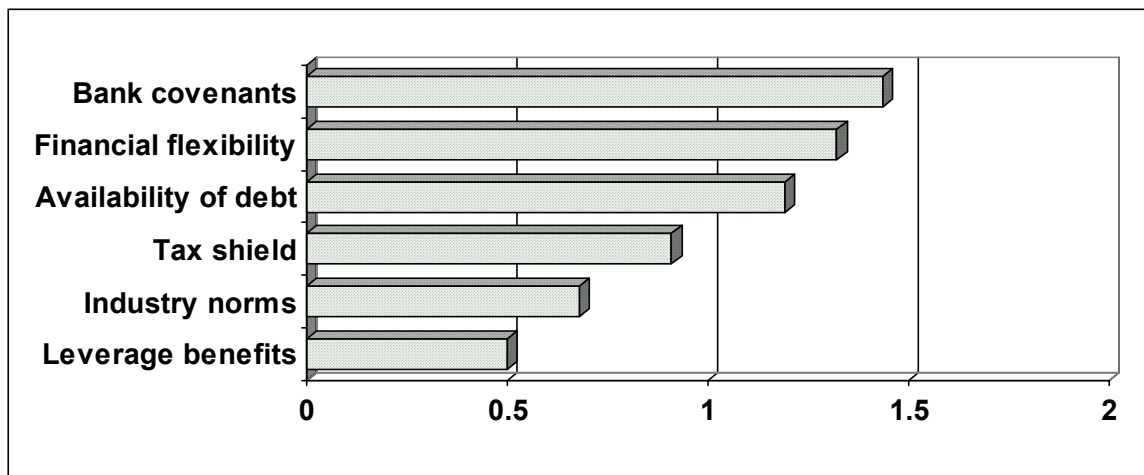


Figure 11: Factors influencing airline debt levels

These airlines tend at least sometimes to take practical issues like prior banking agreements, financial flexibility, and the conditions in the debt markets into account, but they far more frequently look at the “theoretically correct” tax and leverage benefits or benchmark their debt level against other players in the market.

Summarising this section, we can see that airline managers tend to see significant interactions between analysing investments and the way they are financed. The clearest indication is the use of investment analysis techniques to evaluate the lease vs. purchase financing decision. While many use the cost of debt to analyse investments (encouraging over-investment vis-à-vis competitors?), they appear to be quite conventional in selecting financing vehicles for projects and pragmatic regarding the appropriate level of debt on the company’s balance sheet.

## Measuring and adjusting for risk in valuations

In evaluating investment projects, companies must consider risks in both the inputs to their business and, as we have seen, uncertainty regarding the expected returns of investors in the firm. As with the estimates for cost of capital, the literature review shows a variety of objective and subjective methods in use to estimate the level of risk. Once estimated, the two methods to adjust the valuation for risk involve varying the assumptions or inputs to the investment valuation are identified. The first involves using sensitivity analysis (worst case-most likely case-best case) to evaluate project returns or calculating an expected outcome by weighting the various critical inputs with probabilities. Alternatively, risk is dealt with by ‘raising the bar’ for investment approval by requiring a higher forecast rate of return, a shorter

payback period, or both. In this section, we review the practices used to estimate adjust the valuation for risk.

In the literature, risk estimation is found to be largely subjective, though more sophisticated statistical techniques have increased in popularity in recent years. Surprisingly, a relatively small number of executives surveyed report performing “Best/Most like/worst case” sensitivity analysis. The most popular method for adjusting the valuation for risk in the financial community is to raise the required rate of return for investment approval. In spite of the ready availability of modern risk management techniques such as Monte Carlo simulation and Real Options Analysis, these appear to be marginally applied in practice.

Schall et al. found that in 1978, a clear majority of the 189 firms responding to their survey assess risk “only subjectively.” A slight weaknesses of their survey design is that the authors do not clearly distinguish between methods to estimate risk and methods to adjust the valuation for risk.

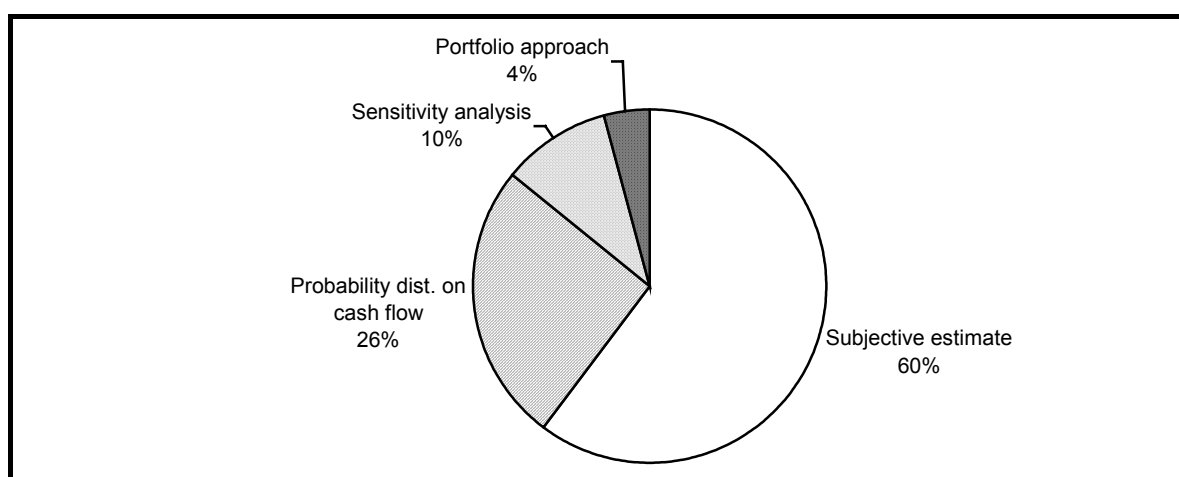


Figure 12: methods of estimating risk in Schall et al. (1978)

Estimating probability distributions for cash flows is used by a significant number of firms to adjust the valuation, while sensitivity analysis and the portfolio approach were far less used. Another clear majority of 78% ‘raise the bar’ by shortening PBK period, raising the required ARR, or raising the discount rate in NPV, to account for risk in the project. They find that one tenth of all firms shorten the PBK period to compensate for risk, while a full 31% of respondents combine shortened PBK with raising the cost of capital or the required ARR. Twenty-three percent of firms were found to use different techniques for different risk classes



Graham and Harvey find that in the of the 392 U.S. firms responding, 71% make adjustments for the market risk (beta value) of a project, confirming heavy use of the CAPM methodology.

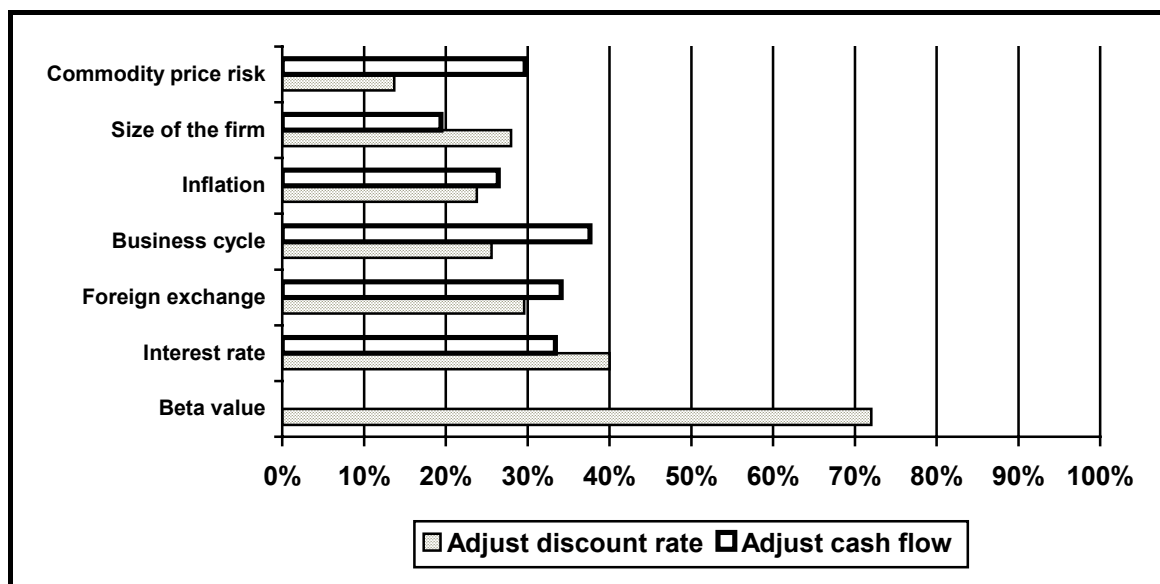


Figure 13: adjusting for various types of risk in 1999 survey in Campbell and Harvey, 2001

They propose a set of risk parameters and ask how companies account for them. Figure 13 shows the parameters, and the percent adjusting discount rate and cash flows at least sometimes for them. While all are relevant, the most important parameters for the airline business are commodity prices (fuel), business cycle and foreign exchange: interestingly, the authors find that a relative majority of firms adjust for these specific risks in the cash flows themselves, rather than raising the discount rate. The authors cite articles (such as McDonald (1998)) that suggest the use of PBK as a proxy for real options, which evaluate a project at a number of decision points during the project.

### ***Airline survey findings on risk evaluation***

Airline CFOs showed reticence on the questions regarding treatment of risk, with 69% declining to respond on one question or another.

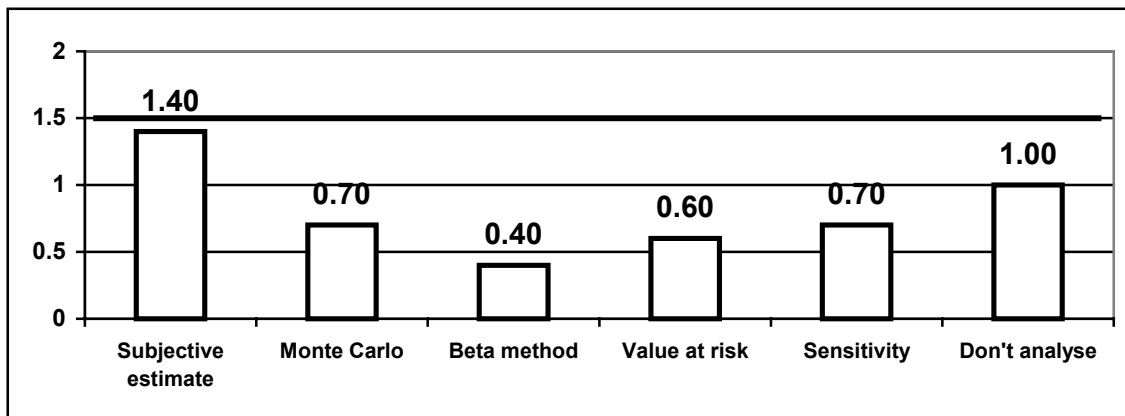


Figure 14: airline preferences for risk estimation

The strongest preference is to use a subjective estimate of risk (1.40), followed by those who never include an adjustment for risk in the valuation, a surprisingly high (1.0). Preference for Monte Carlo-type probability analysis – a complement to and pre-requisite for Real Options Analysis is used as commonly as classic sensitivity analysis, but still only showed a preference ranking of 0.7. The similarly probabilistic Value at Risk, and the “Beta” method of measuring cash flow covariances with the firm as a whole, received the lowest preferences of all. In contrast, adjusting Beta values was found in Graham and Harvey to be the most common method of all. Beta’s infrequent use quite probably reflects both the thinly-traded (or un-listed) nature of airline shares, and the lower preference for CAPM for estimating cost of equity capital outside North America.

Comparing the overall frequency of positive airline responses on the subject of risk methods to a previous survey (Schall et al., 1978) reveals similarities and evolutions. Subjective estimate is still and more strongly the favourite method to capture risk. Statistical methods such as Monte Carlo and cash flow covariance have gained ground, while the number of companies who use sensitivity analysis is stable, and surprisingly low. Airline financial managers are clearly taking risk into account, and substantial numbers are using sophisticated techniques at least some of the time.

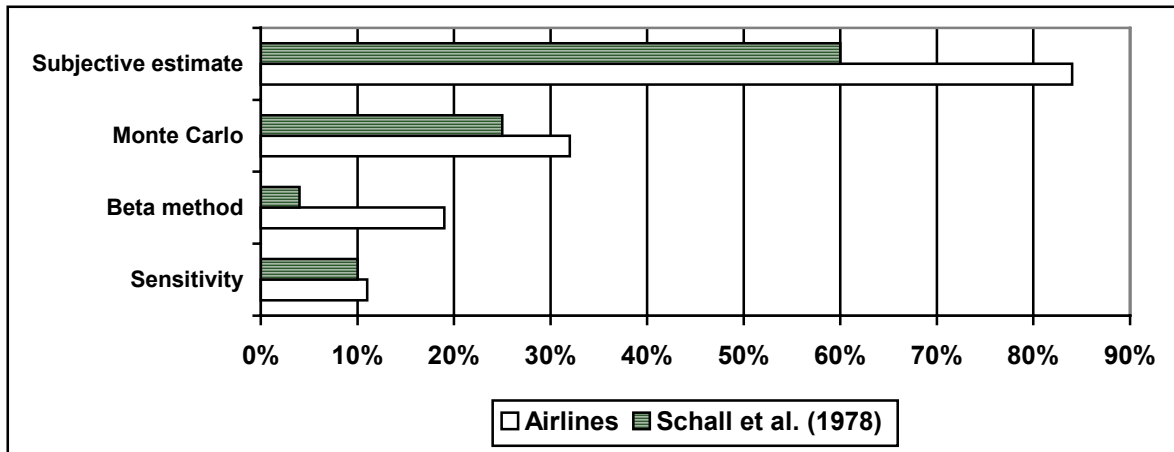


Figure 15: frequency of use of risk estimation techniques "sometimes" or "all the time"

In the area of compensating or adjusting the analysis for risk there are clear tendencies among airline managers, as Figure 16 shows. The common approaches of 'raising the bar' by increasing the discount rate, requiring earlier payback, or raising the acceptable IRR are clearly in use at airlines

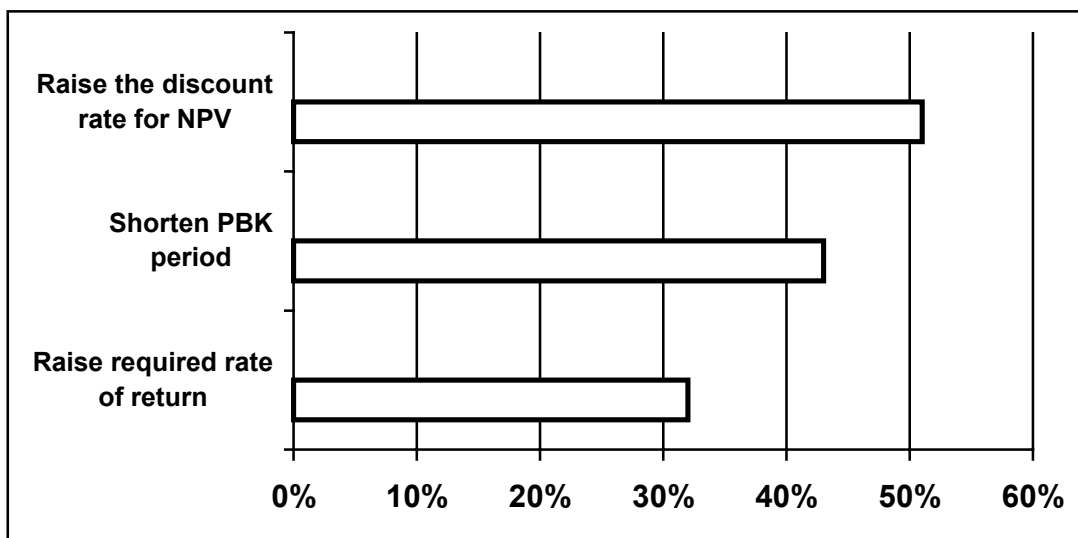


Figure 16: Airline methods to compensate for project risks

We tested the responses for airline executives who both *used* the relevant technique (NPV or PBK) and 'raised the bar.' In all cases we found a pronounced tendency to raise the bar for the CFOs who used the relevant technique: of those who always use NPV, 64% responded that they raise the discount rate in the analysis to compensate for risk. A summary of this tendency, stronger among practitioners of NPV, but still substantial among those who use PBK, is presented in Table 4.

<b>Preference for the techniques</b>	<b>Adjust discount rate</b>	<b>Shorten payback period</b>
<b>Raise the bar?</b>		
<b>Always use NPV/PBK to analyse investments</b>	64%	47%
<b>Sometimes use NPV/PBK to analyse investments</b>	38%	38%

Table 4: tendency for airline CFOs to adjust the analysis for risk

## Conclusions

In summary of field research since 1970, U.S. corporations are clearly found to have tended toward more toward sophisticated cash-based investment appraisal techniques, while retaining a variety of methods to gain insight into project characteristics. The ARR method has moved from an extremely common to a marginal method, while the oldest and most intuitive method, PBK may serve as a gauge of risk, and is in any event still in strong use. The airline managers responding to our survey demonstrated preferences consistent with these trends, while retaining accounting-based ARR more commonly than in the general business community.

Cost of capital estimation has also gotten more sophisticated, with a majority of firms using WACC as their discount rate. Graham and Harvey found that nearly three quarters of respondent firms use CAPM to estimate the investors' expected return on equity capital. These techniques are clearly appropriate in the U.S., with its broad and deep equity and debt markets and consequent high degree of data availability for analysis. The airline CFOs tend to use WACC as a discount rate, though the common use of cost of debt as a discount rate suggests that there are significant interactions between investment and financing decisions. Airline use of investment valuation to compare between lease and purchase alternatives confirms these interactions. Finally, the use of CAPM, depending as it does on broad and deep market for equities and public ownership, strongly preferred by airlines only in the United States.

Risk estimation is found to be very strongly based on subjective appraisal, amplifying earlier findings. Raising the bar for investment approval is found to be the most popular way of compensating for risk. Of the airline managers using Net Present Value, nearly two thirds raise the discount rate to adjust for risk, rather than adjusting the cash flows using either sensitivity analysis or more sophisticated probabilistic techniques such as Monte Carlo and Real Options.

We find throughout this survey that airline managers appear to be somewhat conservative in their approaches to investment analysis, in the “middle of the pack” rather than at the leading edge of investment analysis techniques. This paper establishes certain norms for investment analysis across the global airline industry. More research is need into the reasons for the investment analysis practices and financing choices of airlines. Three key areas of research concern the investment appraisal process among firms with different shareholding patterns, financing source selection and cost of capital estimation in various regions, and risk evaluation and mitigation in this capital-intensive, highly cyclical and changing sector. The most appropriate form for this type of research would be the anonymous interview, where the questions of company process and more in-depth exploration of financing choices can be dealt with more effectively.

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## Appendix 1 – descriptions of specific analytical techniques

Accounting Rate of Return (ARR) is calculated by dividing the average accounting profits over the investment horizon, by the average investment in fixed assets over the same horizon. Clearly not a cash-based measure, ARR results are conditioned by accounting policies, and most importantly, depreciation method and period. Depreciation methods vary widely in the global airline industry, determined by government policies and regulation, tax codes, and national or international accounting standards. ARR results are thus conditioned by accounting standards and company policies, but go beyond the pure earnings approach identified by Mao, in that they explicitly measure profits in relation to the investment in fixed assets such as aircraft.

Net Present Value (NPV) is a cash-based measure. The formula for NPV is:

$$\sum_{t=1}^T \frac{CF_t}{(1+r)^t} - \text{Initial investment}, \quad (1)$$

where T is the investment horizon, CF are the expected cash flows in period t, and r is the company-specific discount rate, also known as the cost of capital. IRR is a complementary measure, being the discount rate which produces a breakeven NPV of 0. IRR is more easily understood than NPV, because it is directly comparable to an interest rate return, while NPV requires an independent assessment of the cost of capital, which is sometimes problematic for unlisted companies. NPV and IRR are clearly not distorted by depreciation policies, and are therefore viewed by most academics and financial managers as more adequate measures of performance than ARR.

Payback period (PBK) is the most intuitive of all measures, being the number of periods (months or years) required to recover the initial investment. For example, an investment of £20m that produces cash savings or incremental revenue of £1.5m per period would have a payback of 13.33 years. Often given short shrift in academic articles and textbooks, PBK is cash-based measure, but ignores the time value of money that is captured in the discount rate in NPV/IRR.



Weighted average cost of capital (WACC) is:

$WACC = r_e \frac{E}{V} + r_d \frac{D}{V}$ , where  $r_e$  is the shareholders' expected annual return,  $r_d$  is the annual interest cost of borrowing,  $E$  is the market value of the firm's shares,  $D$  is the market value of the firm's debt, and  $V$  is the total market value of debt and equity.

The complete form of WACC requires an adjustment for the tax-deductibility of debt:

$WACC = r_e \frac{E}{V} + r_d (1 - T_c) \frac{D}{V}$ , where  $T_c$  is the rate of tax on company profits.

The Capital asset pricing model (CAPM) states return (cost) of equity ( $E(r_e)$ ) as:

$r_f + \beta(E(r_m) - r_f)$ , where  $r_f$  is the risk-free interest rate on government borrowings,  $E(r_m)$  is the expected future return on shares in the market (and therefore  $E(r_m) - r_f$  is a share market risk premium over the risk-free rate), and beta ( $\beta$ ) is the covariance of the firm's shares with the market divided by the variance of market returns.

The dividend discount model of estimating share prices is widely used by equity analysts to recommend shares. The model states share price as a function of the next year's projected dividends ( $Div_1$ ), investor expected returns ( $r$ ) and growth rate ( $g$ ) of dividends:  $P_0 = \frac{Div_1}{r - g}$

The expected return can be calculated given management knowledge of dividend yield and expectations regarding growth:  $r = \frac{Div_1}{P_0} + g$

# Appendix 2 – Airline CFO survey

## Survey of investment analysis in the global airline business

Please complete the questionnaire below and fax to +33 562 121 120 before 31 October 2004.  
All responses are anonymous and confidential. Survey results will be presented in aggregate only.

### I. Analyzing and appraising major investment projects (Capital Budgeting)

Questions 1 - 4: how does your company analyze major investment projects?

#### 1. How frequently does your company use the following capital budgeting techniques?

Always	Sometimes	Never		Always	Sometimes	Never	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Payback period of the investment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Adjusted Present Value (APV)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Accounting Rate of Return (Return on Investment)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Real Options Analysis (ROA)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Internal Rate of Return (IRR)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Economic Value Added (EVA)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Net Present Value (NPV)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Other technique _____

#### 2. For which investments does your company prepare a capital budget?

<input type="checkbox"/>	All investments	<input type="checkbox"/>	For investments over (USD) _____
<input type="checkbox"/>	Investments that are risky enough to justify it	<input type="checkbox"/>	We do not use capital budgeting techniques

#### 3. How frequently does your company compare actual results of investment projects with the original forecast?

<input type="checkbox"/>	More than once a year during the project	<input type="checkbox"/>	At the end of the project life
<input type="checkbox"/>	Every year during the project	<input type="checkbox"/>	Other period _____ years
<input type="checkbox"/>	Between two and ten years after starting the project	<input type="checkbox"/>	We do not perform such comparisons

#### 4. Does your company use capital budgeting techniques to compare different financing alternatives?

Always	Sometimes	Never		Always	Sometimes	Never	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Operating Lease vs. Purchase	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Internal vs. External financing
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Debt vs. Equity issuance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Other alternatives _____

### II. Cash-flow estimation and the discount rate

Questions 5 - 10: How does your company estimate the various parameters and account for risk?

#### 5. How does your company calculate the cash-flow used to analyse your investments?

Please choose the appropriate method from each column

<input type="checkbox"/>	Start with net income and add back depreciation (indirect method)	<input type="checkbox"/>	Analysis done before income tax (pre-tax)
<input type="checkbox"/>	Calculate cash flows directly (direct method)	<input type="checkbox"/>	Analysis done before income tax (after-tax)

#### 6. What does your company use as the cost of capital (discount rate)?

Always	Sometimes	Never		Always	Sometimes	Never	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Cost of debt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	A financing cost based on the intended financing of the investment
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Cost of equity capital	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	A measure based on the riskiness of the project
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Weighted average cost of capital (WACC)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	A measure based on expected growth and dividend payouts
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	A measure based on experience	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Other method _____

---

**7. Does your company use the following techniques to estimate the cost of equity capital?**

Always	Sometimes	Never		Always	Sometimes	Never	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Average historical returns on common stock listed on the market	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Government regulations or directives
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The Capital Asset Pricing Model (CAPM, the "beta" approach)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Dividend discount model
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Inquire as to our investors' required returns	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	A measure based on experience and industry norms

---

**8. Does your company use different types of capital budgeting techniques for different levels of risk?**

Yes  
 No

---

**9. What does your company use to measure the level of risk in a project?**

Always	Sometimes	Never		Always	Sometimes	Never	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Use management's subjective evaluation of the level of risk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Measure the probability of monetary loss (Value at Risk)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Measure the risk of the cash flows using probability distributions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Other assessment_____
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Measure the covariance of a project's cash flow with cash flows of other projects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	We do not take the level of risk into account

---

**10. Which of the following does your company use to take risk into account in capital budgets?**

Shorten the required payback period  
 Raise the discount rate used to calculate present values  
 Raise the required rate of return  
 Other technique\_\_\_\_\_

---

**III. Corporate finance and project finance**

*Questions 11 - 14: are there interactions between investment and financing decisions?*

---

**11. Does your company have a preference for project financing?**

*Assuming all sources were available to your company, please rank your preferences, 1 to 4 or choose, "no preference"*

Prefer to use internally-generated funds  
 Prefer to issue equity  
 Prefer to minimise initial outlays, for example through operating leases  
 Prefer to issue debt  
 No preference

**12. Does your company have a target for the ratio of debt to equity capital?**

- No target  
 Flexible target  
 Strict target

**13. What factors does your company use to evaluate the appropriate amount of debt for the firm?**

- | Always                   | Sometimes                | Never                    |   | Always                   | Sometimes                | Never                    |   |
|--------------------------|--------------------------|--------------------------|---|--------------------------|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | The tax-deductibility of interest payments                  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | The volatility of our profits and cash flows                            |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Financial flexibility from using internally-generated funds | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Restrict debt so that profits can be fully captured by our shareholders |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | The debt levels of other firms in our industry              | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Availability of debt compared to equity                                 |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Restrictive covenants in financing contracts                |                          |                          |                          |   |

**14. Company dimensions, growth and ownership**

Please fill in one square in each category that best describes your company

**ICAO Region of your airline**

- |  |  |
|--|--|
| <input type="checkbox"/> Asia and Pacific            | <input type="checkbox"/> North America, Central America, Caribbean |
| <input type="checkbox"/> Eastern and Southern Africa | <input type="checkbox"/> South America                             |
| <input type="checkbox"/> Europe and North Atlantic   | <input type="checkbox"/> Western and Central Africa                |
| <input type="checkbox"/> Middle East                 |  |

**Aircraft currently in operation**

- |   |   |
|---|---|
| <input type="checkbox"/> 10-29 aircraft | <input type="checkbox"/> 50-74 aircraft   |
| <input type="checkbox"/> 30-49 aircraft | <input type="checkbox"/> Over 75 aircraft |

**Number of aircraft types currently in operation**

- |   |   |
|---|---|
| <input type="checkbox"/> 1-2 aircraft types | <input type="checkbox"/> 6-10 aircraft types    |
| <input type="checkbox"/> 3-5 aircraft types | <input type="checkbox"/> Over 10 aircraft types |

**Approximate annual revenue in US\$**

- |   |   |
|---|---|
| <input type="checkbox"/> Less than \$50 million | <input type="checkbox"/> \$100-250 million  |
| <input type="checkbox"/> \$51-99 million        | <input type="checkbox"/> Over \$250 million |

**Historical annual revenue growth rate**

- |   |   |
|---|---|
| <input type="checkbox"/> Less than 3%         | <input type="checkbox"/> 6-15% annual growth    |
| <input type="checkbox"/> 3 - 5% annual growth | <input type="checkbox"/> Over 15% annual growth |

**Largest shareholder in the company**

- |  |  |
|--|--|
| <input type="checkbox"/> Majority of shares trade on the stock market (bourse) | <input type="checkbox"/> Private investors |
| <input type="checkbox"/> Government or government agency                       | <input type="checkbox"/> Another airline   |