

Capital budgeting practices in compagnies with activity abroad: the evolution of the use of tools through time

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PAPIERS DE RECHERCHE

WORKING PAPERS

**CAPITAL BUDGETING PRACTICES IN
COMPAGNIES WITH ACTIVITY ABROAD: THE
EVOLUTION OF THE USE OF TOOLS THROUGH
TIME**

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Corporate Finance

**Capital budgeting practices in companies
with activity abroad: the evolution of the
use of tools through time**

October 2005

Abstract

This paper, constructed as pedagogical notes, serves two complementary targets. On the one hand, it belongs to the initial part of a global applied research that should bring new arguments to the recurrent results obtained by previous studies, i.e. the observation that almost invariably, American corporations, multinationals and large companies have been found to have more sophisticated and advanced approaches to project evaluation than non-US, small-sized and country-focused (as opposed to international) ones.¹ On the other hand, the authors are concerned about the current disparity of academic opinion on the evolution of decision tools for project evaluation. Some scholars believe in an increasing sophistication and others don't. Therefore, such a paper should be considered as an invitation to keep up with the latest academic theory and tools used by organisations to evaluate projects. Material that is taught to our readers today will surely be complemented through the decades to come, just as it was in the past. An original chronological approach has been chosen in order to emphasize this last point.

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1. INTRODUCTION

Almost invariably, American corporations, multinationals and large companies have been found to have more sophisticated and advanced approaches to project evaluation than the non-US, small-sized and country-focused (as opposed to international) ones.² Using a chronological approach, this paper provides a synthetic collection of the existing theories and surveys covering corporate finance topics. The literature review is focused on applied research concentrated on the specific aspects of investment decisions and capital budgeting tools used by practitioners. We believe that our chronological approach offers a new point of view on the use of management decision tools and should sensitize readers to the necessity of keeping up with forthcoming tools.

The dual acceleration of time and growth of space (spatialization) in our global world calls for faster decision making and accurate use of tools. A historical review of the practices and the perspective brought to the changes operated during the last four decades should bring some relativity to users' perception and comprehension of the tools. In a rapidly changing world, the famous Karl Marx statement can find new kinds of illustrations: *"He who ignores the past, is condemned to relive it."* Such a historical approach requires contextualisation as the limit of Marx's statement can be detected in a very low probability of occurrence of similar 'states of business'. Assuming that escalating complexity has probably led to the use of increasingly sophisticated tools; this deliberately provocative, non-Popperian-Marxist point of view will be discussed as part of a contemporary academic debate on the reliability and practicality of emerging tools, such as Real Options Valuation (ROV). As a recommendation, we believe that as this global acceleration continues, current or future managers should constantly be prepared to use even more sophisticated tools, as might be required by social governance structures. Therefore, such a paper must be considered as an invitation to keep up with the advancement of theories and tools. Material that is today taught to our readers will surely be complemented over the coming decades, just as it was in the past.

1.1 About the central topic of the current research

1.1.1 Corporate finance definitions and firm environment

Half a century ago, the “theory of finance” was described as a combination of two central questions: (1) the financing question and its implications on the choice of an optimal capital structure; (2) the dividend question or how a residual income distribution can explain decision factors.

Modern finance theory, after a spread introduction of quantitative analysis will focus on a double issue: the prediction of stock prices and the minimization of portfolio risks. To provide an accurate definition of Corporate Finance, as we know it today, precisions and clarifications must be made. Reference finance manuals provide a pedagogical overview.

According to Bodie and Merton (2001)³, Finance is a scientific discipline that studies rare resource allocation across time, in an uncertain environment. Its three main concerns include: time optimization, asset evaluation and risk management. The authors believe that understanding financial matters involves a global comprehension of the financial system and of the financial statements that comprise one of its key information sources. Two specific characteristics differentiate a financial decision from a generic one: revenues and expenses are (1) spread over time and are (2) uncertain for any actor. Finance, as a scientific field is known as Finance Theory and provides a set of concepts that are aimed to provide help in the *organization* of resource allocation over time. It also provides a set of tools allowing the comparisons of the different possible alternatives as well as allowing processing through the choice made. Capital budgeting is a specific finance application to corporations and belongs to the series of other decisions to be held into the company: strategic planning, funds seeking, operations management. Each decision will be related to the others and will also depend on the company's core business, its competitive environment and legal constraints.

Although it doesn't need to be clearly defined that way, we will consider Corporate Finance as "Finance applied to corporations". This includes the issues described by Brealey and Myers (2000)⁴ when they refer to financial decisions,⁵ i.e. investment and financing decisions and their interactions.⁶ Corporate financial principles are addressed to financial managers to help them in providing accurate answers to the two fundamental preoccupations: "*What investment should the firm make?*" and "*How should it pay for these Investments?*". Matching these two concerns, their ultimate target becomes "*to find assets which are worth more than their costs*". This statement partially describes what Brealey and Myers qualify "*the secret of success in financial management: to increase VALUE*". The value of an asset is not only the market one. The contribution of the management of this asset, once it has been purchased, is part of its value. Therefore the financial manager must be regarded as the link between the firm's operations and the financial market, which concerns both the present and the future.

Albouy (2000)⁷ believes that corporate finance theory couldn't by itself modify the corporation's processes. He considers that the exogenous constraint, Globalization, together with the liberalization of capital markets and the Shareholder's coming out have strongly contributed to the adoption of tools by managers. Pesqueux (2000)⁸ defends a similar opinion, identifying Globalization as a major factor of the evolution of capitalism. Agreeing with Brealey and Myers, Albouy encourages us to focus on value creation. Value creation has become the current preoccupation for companies that used to focus on increase in turnover, market share, and net income. This ultimate target satisfies the underlying assumption of the finance theory, i.e. the objective of a company is to maximize shareholders' wealth.

Presenting an international perspective on Corporate Finance tools, Eitemann, Stonehill and Moffet (2004)⁹ underline the difference between Shareholder Value Creation (SVC), mainly describing Anglo-Saxon models of firms, and Firm Wealth Maximization (FWM), perceived as being the European and Japanese model. In the latter model, shareholders, managers, employees, suppliers, debtors, local or national institutions are supposedly treated in an equal manner. A high profitability in the long term should then satisfy them all. This statement is different to the application of the Shareholder Value Creation (SCV) model, which seems to encourage short-termism rather than long-term management. Nonetheless, the SCV has led to the coexistence of a dual capitalism – impatient versus patient – whereas the FWM model is perceived as a foundation for a “participative capitalism”. Differences in the two environments are summarized in Table 1.

Model	Shareholder Value Creation	Firm Wealth Maximization
Where it is applied	US – UK and Commonwealth	Europe and Japan
Firm target	Maximizing shareholders value	All stakeholders' satisfaction in the long run by generating future cash flows
Value measurement	Capital gains and dividend according to the given level of risk	Firm position on financial market, cumulated knowledge, employees technical and administrative skills
Risk management	Firm must minimize level of risk taken by shareholders for a given level of profit.	Reduce environment uncertainty
Risk definition	Any additional risk carried by a stock that is added to a diversified portfolio	A global (environmental) risk: financial and operational
Assumptions - strong - weak	- Stock market efficiency	- Loyalty/stability of shareholders - Stock market efficiency
Limit	Short-termism and window dressing of company accounts	Accounting and finance indicators are not sufficient to describe the company performance

TABLE 1: CORPORATE FINANCE TARGETS ACROSS DEVELOPED COUNTRIES, MODELS COMPARISONS AND IMPORTANCE OF PARAMETERS, BASED ON EITEMANN, STONEHILL AND MOFFET (2004)

1.1.2 Contemporary concerns about investment decisions

Since most of the research work and results cited in this note refer to “capital budgeting practices”, *Capital Budgeting* can be used as a synonym for investment decisions. This concept includes several ideas describing financial managers’ chronological actions:

- the selection / rejection of potential projects the firm could invest in
- the capital budgeting tools applications, measuring the firm’s targets, including:
 - ~ income measurement
 - ~ estimation of the cost of funds¹⁰

Capital budgeting practices are the focus of this work, and the part of Corporate Finance dealing with financing decisions, how to finance projects using debt and equity and where to source the funds, is out of scope. The topic of this note is to describe how, across time, managers have been using, or haven’t used, the capital budgeting tools recommended by researchers.

The material available in the cited research carries little if any information about the decision process. Charreaux (2001)¹¹ and Jensen (1993)¹² both call for more focus on the study of “how investment decisions are actually made in practice” rather than “how they should be made”. Behavioural finance is a growing field that draws on knowledge from sociology and psychology. It considers that decisions are not purely driven by quantitative data, but are strongly influenced by personal values and intuition, situational context, and tolerance for risk. However, the emergence of the field of historical finance has shed even further light on the subject, and out of all the approaches identified, we’ve chosen this as the framework for our research.

1.2 About the relevance of an historical approach

1.2.1 *The turn to modernity*

Baskins and Miranti (2003)¹³ oppose statistics to history in a double lenses observation, differentiating their beliefs from Schumpeter's (1954)¹⁴ thoughts that placed history as a major process through facts, sense and historical experience¹⁵, when the greater quantification of economics and finance was encouraged by a scientism trend defended by leading philosophers of sciences. Since World War II the Information Technology revolution has enabled powerful data processing and storage, which in turn has permitted the analysis of different business sectors using data collected on a global scale.

Historical analysis has allowed Baskins and Miranti to identify four major contributions of financial innovations :

- (1) the possibility to raise substantial amounts of financial capital freed up time for innovation and learning and therefore allowed economies of scale and scope
- (2) financial management tools helped firms to capture gains from exogenous events
- (3) the reduction of risk perception generated raises in gains
- (4) costly imperfections, such as transaction costs have been reduced

Organisational development through the routine stage, then integration and coordination stage, ending with the strategic planning stage are also contributors to a raise in efficiency.

Hatchuel (2004) suggests an interesting picture of those different steps that can be related to the Prahalad stages.

The Italian Company	Manufacturing	Modern Management	Post-modern or Neo-company
Relationships based network, knowledge flows are controlled, participation in projects has to be negotiated, merchants have control	A new moral statute, unions, internship, R&D, entrepreneur (creating jobs, factories and goods) have the control, contract relationship and hierarchy	Administrative process, multiple skills, collective part of the company (rules, methods are to be adopted), company = place for modern social development	The Financial and innovation capitalism pressures increase, unbalanced position, fast changes call for adaptability and fast understanding
TRANSACTION	COOPERATION	SHARING	INTEGRATION?

1215

1599

Late 16th
- Early 17th C

Early 1960s

2000s

TABLE 2: HISTORY OF THE FRENCH BUSINESS REVOLUTIONS ~ A REPRESENTATION BASED ON A MIX OF HATCHUEL AND PRAHAD WORKS

1.2.2 Four decades of changes: a research history

The central topic in financial management, capital budgeting, has been subject to numerous surveys for the last forty years. Since Shapiro's pioneering work in 1968,¹⁶ leading theory has been constantly updated by a series of replicates and complementary works. Throughout the decades, theoretical breakthroughs have led the way to more complex and thorough company practices. Recent studies reveal that "most responding companies use a fairly sophisticated capital budgeting process" (Farragher, Kleiman and Sahu, 1999)¹⁷ and "rely heavily on present value techniques and the capital asset pricing model" (Graham and Campbell, 2001)¹⁸. There are, however, opinions to the contrary as well, like that of Andrew Buckley, who concludes based on the same findings (between 1968 and 1996), that "there has not necessarily been a continuing increase in sophistication of techniques used over the recent past." (Buckley, 2000, p.414).

Significant progress has been made in bridging the gap between theory and practice (see Albouy, Op. cit.). Nowadays, questions as how to measure revenue and net income from a project, what capital budgeting techniques to use exactly, and how to define the 'true' discount rate are no longer issues for large companies. The area in which improvement is still needed is with respect to risk adjustment. The real issues of today are different from the technical ones of the past. One of them lies in overcoming the considerable disparity between practices in large and small-sized companies, as the results of research suggests.¹⁹ Another challenge facing researchers in project evaluation practices is launching their investigation outside of the well-known perimeter of US and UK companies. Little is known about the rest of the world, even the developed countries. For example, little literature exists concerning French business organizations. Moreover, when participating in issued surveys, the low number of responses doesn't help to conclude in a significant way.

There is much evidence to suggest that US scholars dominate the field of capital budgeting and finance in general, in particular in terms of conceptual work and field research. Most of the surveys on the subject have been conducted by American researchers though there is a growing interest on the part of their overseas counterparts, mainly in the UK but also in other Western European countries like Belgium. When reviewing statistical research on capital budgeting one cannot fail to notice that the level of adoption of academically approved techniques varies from company to company. American, large and multinationals business organizations have been found to have more sophisticated and advanced approaches to project evaluation than the non-US (Kim, Farragher & Crick, 1984, Shao & Shao, 1983)²⁰, smaller ones (Wicks, Kelly & Philippatos, 1982²¹, Stanley & Block, 1983²², Drury & Tayles, 1996²³, and Graham & Campbell, 2001²⁴) and local ones (Buckley, Buckley, Langevin & Tse, 1996)²⁵. Details on statistically tested relationships will be discussed further in this paper.

The leitmotiv in recent research on project evaluation is that this field of financial management and corporate finance have been widely explored, if not over-explored in the last few decades. Nevertheless, surveys continue to be conducted. In fact, it seems that the periodical queries into companies' practices constitute the right approach to observe the trend and act if necessary, as for managers, making the effort to adopt more sophisticated tools or for academics to elaborate their communication in order to better explain what is at stake.

1.2.3 A historical and contextual perspective

The following chronological structure suggests an outline of the main changes in capital budgeting tools over the decades. Each decade from the 60s to the late 90s is described in order to provide an overview of the tools used in different contexts, but always linked to the capital budgeting problematic. One of the recurrent items studied is the classification of decision criteria and identifying the primary one. What discount rate to use and how to assess for risk are further recurrent questions. Another point deals with income versus cash flow measurement, and the use of measurement tools is compared for foreign activity versus domestic. We study each of these tools and comment on its individual evolution where available data permits. In order to better understand the improvement in decision-making, research results will be placed in respective economic context. This effort supports Albouy's assumption that sometimes, exogenous factors, can explain more than the gap between theoreticians and practitioners, the late or very fast adoption of (new) tools or a shift to a more robust use.²⁶

Offering a contextual analysis should contribute to increasing the performance of present and future practitioners in decision-making. A historical perspective explaining past choices and mistakes can make practitioners aware of the need to constantly update their tools and techniques.

2. A PIONEER WORK WITNESSES THE END OF MASS CONSUMPTION

In the early sixties, modern management is the model applied for running companies. It can be described as a combination of core administrative processes, the need for multi-skilled managers, and the emergence of a collective part of the company (rules, methods are to be adopted)²⁷. Then the company keeps on being the place for modern society development.

A turning point is reached at the end of the decade, when the supply of industrial goods meets their demand, as shown in Figure 1. Mass consumption reaches its limits when a surplus of production can be predicted. Western economies are ready to shift from a production driven model to a market forces driven model. A manager's perspective changes when industrial goods demand can no longer be described as a simple function of financial and production flows. New variables have to be included in the demand estimation and marketing has then a crucial role to play. As the existence of the production surplus generates the uncertainty of the sales, corporation's decisions that used to rely on the replication of past activity must then include volatility due to the risk of not reaching the expected volume of sales. At this turning point, tools used to support decision-making must be adapted to emerging changes in the environment.

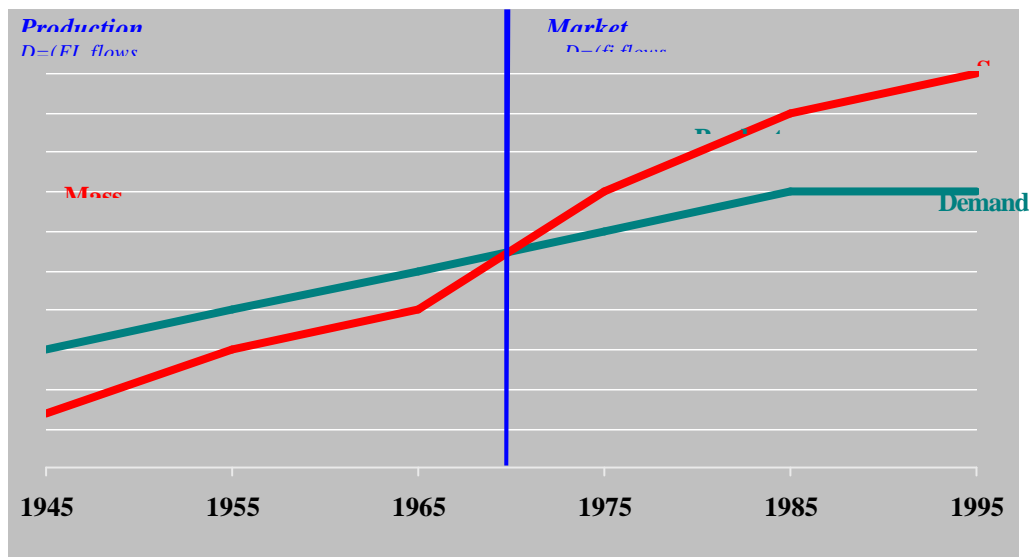


FIGURE 1: EVOLUTION OF SUPPLY AND DEMAND OF INDUSTRIAL GOODS, WORLD WAR II– 1995
(SOURCE OECD)

In this evolving context, the model of a company progresses towards what Hatchuel qualifies as the Post-modern or neo-company, characterized by its constant dealing with financial and innovation pressures, its unbalanced position, and the fast understanding that is necessary to adapt to fast changes. In those circumstances, managers must adapt their decision tools and have them include uncertainty-linked assumptions. At the head of what is now known as the Modern Finance theory, Markowitz (1952)²⁸ has already suggested the existence and need to consider uncertainty.

It is in this context that Stonehill & Nathanson (1968)²⁹ publish the first survey addressing effective practices stemming from academics' recommendations. It tests the practices used for foreign investment evaluations and suggests solutions. This pioneer work had US and non-US Multinationals companies as objects of observation. The survey questionnaire was mailed to 219 US and 100 foreign multinational corporations (MNCs). Replies were received by 92 US and 18 foreign MNCs, giving an overall response rate of 34%. It is worth noting that while almost half of the US companies replied, only a fifth of the foreign ones did.

The findings gather evidence of the starting stage in the evolution of large companies' application of capital budgeting techniques. The authors observe that "*financial investment criteria were used most often in evaluating relatively small cost-saving projects or replacement projects*" but as far as large or strategic investments were concerned their role was downgraded to that of "*rough screening device to prevent obviously unprofitable projects from wasting the time of the board of directors*". At the industrial engineering level the calculations were quite consistent with the theory but as project evaluation passes to senior management, theoretical financial investment criteria seemed to be less well understood and often subordinated to other considerations.

Results show, without testing statistical significance, that income measurement methods are spread in similar proportions between all relevant earnings, book return on book investment, and all considered cash flows.³⁰ The cost of capital used is in majority a constant one. Risk assessment is for half of the respondents evaluated subjectively.

The contribution of the paper relies on three major conclusions. It appeared that the companies did not follow theory in terms of recommended techniques for evaluating overseas projects. Many MNCs set sights too low on required rate of return on foreign investment as they only used book earnings rather than a future oriented financial analysis. Furthermore, the expected rate of return should be adapted to local risk factors – this includes the estimation of the cost of capital. The company's priorities were not clarified. Strategic considerations such as market shares dominated. A more rigorous financial analysis was considered as not being worth the time and couldn't justify the cost involved.

The authors recommended that the acceptance criterion for foreign investment projects should be a positive net present value, both from the viewpoint of the parent corporation and of the foreign subsidiary.

3. IMPACT OF OIL CRISIS ON THE COMPANY'S PROCESS

The end of mass consumption marked the previous decades, with no significant effects on companies' processes. An analysis of the 1970s reveals an inertia in the adoption of new evaluation tools. Markowitz's innovative work has been extended by Lintner (1965)³¹, and a model of the risk associated with uncertainty can now be offered to companies. From a theoretical point of view, the strong assumptions of efficient markets become fundamental.³² In 1970, Fama³³ strongly defends this market rationality when stating that *"the evidence in support of the efficient market hypothesis is extensive... and contradictory evidence is sparse"*.

With the objective to test whether there had been a significant change in the evaluation of foreign investment projects since the first 'snap-shot' offered by Stonehill and Nathanson in 1966, two groups of researchers – Wicks, Kelly, & Philippatos on the one hand, and Oblak & Helm on the other – replicated the original pioneering survey. The formulation of most of the questions matched with that of Stonehill and Nathanson, making the comparison easier. Both research projects published in the early 80s were however conducted in the late 70s. Therefore, their results are probably impacted by the first oil crisis in 1973. This unpredicted event surely had an influence on the risk perception and the necessity to assess for it.³⁴

Wicks, Kelly, and Philippatos (1982) surveyed the capital investment practices in the big multinational-calibre companies. They targeted US-based MNCs with controlled subsidiaries in at least six foreign countries (filtered from 1977 Fortune 500) and obtained an improved response of 47%. Almost coinciding with the latter study, the investigation by David Oblak and Roy Helm (1980) derived results from the same source but with wholly owned subsidiaries in at least twelve or more foreign countries. At 26% the response rate was low. Another US economist, Bavishi (1981)³⁵, mailed questionnaires to the financial executives of 306 MNCs selected from the 1978 Fortune 500 largest US industrial corporations on the basis of having more than 10% of overseas assets. The response rate was 51%, the highest obtained so far.

In contrast to Stonehill and Nathanson, Oblak and Helm investigated the capital budgeting techniques to find out that internal rate of return (IRR) is a strong leader with 60%. This finding can be moderated with Wicks, Kelly, and Philippatos findings where IRR leads with 46%. Bavishi conclusions differ, observing that IRR is getting popular but still second to payback period. In total, the tools based on discounted cash flows are preferred by three quarters of the responding companies, though net present value (NPV) still falls behind with a similar result of 14-15%.

Regarding income measurement the results show agreement between theory and practice as most companies reported using any combination of views with respect to subsidiary and parent companies. Oblak and Helm confirmed that more than 50% of the companies reported measuring cash flows.

Wicks, Kelly, and Philippatos differentiate between cost of equity, cost of debt and weighted average cost of capital (WACC) from the subsidiary and parent points of view and discover that companies follow academic recommendation. Stonehill and Nathanson had encouraged companies to apply the normal worldwide WACC to their foreign projects, though Oblak and Helm found out that most of the companies vary their WACC subjectively or by using a local WACC in order to adjust for foreign risk. Concerning the risk assessment, the findings are consistent with the ones of Wicks, Kelly, and Philippatos and Bavishi although the latter suggests that the risk adjustment methods offered by science are inadequate.

Stonehill and Nathanson disapproved of the MNCs making the foreign risk adjustment subjectively while the theory proposed risk-absorption programs. The respondents to the Oblak and Helm questionnaire seem to pay slightly more attention to risk primarily by borrowing locally but also by using insurance and, of course, adjusting the accounting rate of return (ARR), cost of capital or payback period (PP).

The 1970s marked by the first oil crisis saw the emergence of the discounted cash flow (DCF) methods. Results of surveys conducted during that decade showed that practitioners were showing more concern for academics' research, but risk assessment was yet to improve. However, managers were probably preoccupied by the high inflation observed in this decade. Investment was then sustained by negative real interest rates that were going through their last decade of existence. With high inflation, the cost of borrowing was not significant, therefore financial leverage was high and loans provided the necessary funds for investing.

4. MARKET LIBERALIZATION AND THE SEARCH FOR AN OPTIMAL CAPITAL STRUCTURE

Liberalisation of the capital market in the early 1980s changed the decision alternatives of managers. The larger availability of funds in financial markets combined with the control of inflation resulted in a shift of interest rates to a structurally positive real rate, i.e. superior to inflation; therefore contracting debt was less advantageous. This decade witnessed awkward net incomes: for some industrial companies financial revenues provided a higher contribution to net earnings than revenues generated by their core activities. In such a case, industrial investment is less attractive and requires deeper analysis.

Stanley and Block (1983)³⁶ surveyed 339 Fortune 1000 largest US firms operating in more than 5 countries and obtained a 36% response rate. Kim, Crick and Farragher (1984)³⁷ examined how US and non-US multinationals took into account the principles of foreign direct investment (FDI): in 1982 Fortune 500 largest US and 500 largest non-US companies – and thus provided for a better representation of non-US business. Respondents were 186 US firms (37.2%) and 127 non-US firms (25.4%).

Stanley and Block confirmed the now leading position of the IRR criterion. The results of the survey affirm the leadership for the IRR and NPV as primary capital budgeting techniques. PP is still an important secondary criterion.

Kim, Crick & Farragher examined how US and non-US multinationals take into account the following principles of FDI:

- Multinationals should value only those cash flows that can be repatriated because only these funds can be used to reinvest in other subsidiaries, pay dividends, pay debt obligations or invest in new ventures.
- Multinationals should use DCF methods because they clearly recognize the time value of money and also employ the cash flows of a project over its entire life span.
- Multinationals should use their worldwide weighted average cost of incremental capital for evaluating foreign projects because those projects that yield more than the firm's average cost of capital will increase the value of the firm. (Given the above premise about repatriation.)
- Multinationals should use either the certainty equivalent approach or the risk-adjusted discount rate in order to adjust project estimates for risk because these two methods are theoretically more sophisticated than other methods.

The survey found that the theory was followed by the companies except for risk adjustment where unsophisticated methods like shorter maximum payback period or higher minimum accounting rate of return are still preferred to the Certainty Equivalent Approach or the risk-adjusted discount rate, heavily favoured by academia.³⁸ The trends proved stronger for the US than for the non-US companies.

5. THE FIRST GULF WAR AND THE ADOPTION OF SOPHISTICATED TOOLS

The 1990s are particularly abundant with academic research on project evaluation. Some innovations were also tested then. Therefore, we suggest an initial linear overview of the research conducted.

5.1 Shao, & Shao: Survey on European affiliates of US transnational companies

After three decades of exploration into practices of US multinational companies, in the beginning of the 1990s Laurence Shao and Peter Shao ventured an investigation on capital budgeting in the European affiliates of American-based transnational companies (TNCs). 33% of the selected 274 companies responded. Most responses came from the UK (19).

The results revealed that 55% of the respondents preferred DCF methods as a primary decision tool, which comprised 38% for IRR and 17% for NPV. NPV was the most popular secondary technique followed closely by the PP. Shao and Shao point out a difference to earlier surveys done in the 1970s and 80s, where at least two thirds of the largest US companies use DCF criteria.

Interesting data can be found in the reported level of usage of sophisticated DCF techniques by countries. France was one of the average cases with about half of the European affiliates applying sophisticated techniques. UK, Germany and Belgium were at a similar level. The level of compliance was higher in countries like Spain, Ireland, and Sweden and lower in Switzerland, Netherlands, and Italy.

Only 30% of the companies reported using the recommended theoretical WACC while the 41% preferred the cost of debt as a discount rate. The researchers explain this result as the attempts of the affiliates to insure against foreign exchange risk by borrowing heavily on the local financial markets.

The results on risk management practices kept on revealing deviations from the theory. Many affiliates made no adjustment for risk. The others preferred to adjust the PP or the cash flows subjectively against the theorists' recommendation to use discount rate adjustment and certainty equivalents. Though most of the companies said they assessed risk, many did it subjectively. Among sophisticated techniques, sensitivity analysis was reported the most widely used.

5.2 Buckley, Buckley, Langevin & Tse: UK Multinationals Survey

The first investigation of international investment evaluation of UK-based multinationals was conducted in the mid-1990s. Buckley, A., Buckley, P., Langevin and Tse sampled 217 large companies headquartered in Britain and engaged in all business except financial and professional services and property. They achieved a response rate of 41%.

Regarding the income measurement for foreign investments the results revealed a lack of focus by companies on the use of home instead of host currency (even in countries with exchange controls one third of the respondents did not measure income in pounds). The respondents reported using the most correct criterion in theory – remittable profits and fees after host and home taxes in home currency – when measuring income from countries with exchange controls, but not when measuring income from countries without exchange controls, which was the recommended practice.

In view of capital budgeting, the use of discounting techniques was found to be dominant but payback and accounting rate of return were still important.

5.3 Drury & Tayles: UK Largest Companies Survey

Though conducted at almost the same time, the results of another survey on UK capital budgeting practices present a quite different picture from the one described above. The reasons for this are probably the larger sample and the inclusion of all kinds of investment projects, not just overseas ones.

The sample of 866 business units was established by extracting all UK companies with substantial manufacturing, production or extracting activities and a five-year average turnover exceeding 10 million pounds from a database. A total of 303 companies completed questionnaires (35% response rate).

According to the replies the most widely used capital budgeting method was PP followed by DCF techniques. The trend was validated for the largest as well for the smallest business units, though for the latter it was found to be stronger.

5.4 Farragher, Kleiman & Sahu: US Largest Industrial Companies Survey

At the end of the 1990s Farragher, Kleiman and Sahu conducted a survey on the current capital investment practices in the USA. They sent questionnaires to the CFOs of each of the 379 US companies in the Standard & Poor's Industrial Index. 128 replied (34% response rate).

The scholars found out that “an overwhelming 93%” of the companies measured investment returns on a cash rather than income basis. Usually they required a forecast of annual operating cash return (97%), working capital changes (85%) and residual cash flows (72%).

DCF techniques led convincingly ahead of PP and ARR. 80% of the respondents used IRR and 78% NPV against 52% for PP and 34% for ARR. Unfortunately there is no indication about which of them was used as a primary and which as a secondary technique.

The results show that about half of the companies practiced risk management. 55% required a quantitative risk assessment, performed in most of the cases by sensitivity analysis or scenario (High-Average-Low) analysis. Only a few companies used Monte Carlo simulation and Beta analysis. About two thirds of the respondents required formal written assessment of the non-quantifiable risk of the investment.

In the end of the 20th century, the US largest companies proved to be quite sophisticated in terms of capital budgeting techniques used in the investment evaluation process but less so regarding risk management.

5.5 Graham & Campbell: US and Canada Survey

The beginning of the third millennium was marked by the publication of the largest-sample survey ever done. John R. Graham of Fuqua School of Business, Duke University, North Carolina and Harvey R. Campbell of The National Bureau of Economic Research at Cambridge, Massachusetts sent, with the support of the Financial Executives Institute (USA) questionnaires to 4400 companies in USA and Canada. They received 392 responses (9% response rate).

The survey results confirmed that the practices had changed significantly since the early days of Corporate Finance. The DCF techniques had got a clear lead as the most frequently used capital budgeting methods. A particularly interesting finding, different to prior findings, is that the numbers of respondents choosing IRR and NPV were almost the same (IRR had led in all previous surveys).

Regarding the computation of discount rate, CAPM was reported the most popular method followed by the average stock returns and the multi-beta CAPM. Dividend discount approach was found to be not particularly popular. More than half of the respondents reported using a company-wide discount rate.

The Graham-Campbell investigation is one of the most comprehensive studies of the current practice of corporate finance. It is also remarkable because of the sophisticated statistical analysis tools it uses. To allow for a thorough study of the results, the section of questions on the demographics of the participating companies has been enlarged to include not just the size, industry and percentage of foreign sales but also characteristics like price/earning ratio, long-term debt ratio, credit rating, CEO age, CEO tenure, CEO education, executive stock ownership, public/private, etc.

5.6 Research on The Practices of French Companies

Probably the only, at least the only known to us, research on the project evaluation practices in French companies was conducted by the Belgians Eric De Bodt and Henri Bouquin (see Charreaux, 2001). It had, very unfortunately, an extremely low response rate (4,4%). However, its results can be cited in the absence of more representative ones.

IRR was found to be the most popular criterion followed by Payback period. NPV came third. This result is quite in contrast with the practices in the US companies, where NPV had already surpassed PP by the end of the 1990s. About one third of the respondents reported using WACC; the rest determined the discount rate in other ways. Sensitivity and scenario analyses were singled out as the most widely used criteria for risk assessment.

6. CONCLUSION

Since 1968 and the pioneering work of Stonehill and Nathanson, surveys have taught us details about the adoption of sophisticated tools in Capital Budgeting. Thanks to their overall statistical reliability, the combination of research and survey results has contributed to a firm understanding of companies' behavioural evolution using capital budgeting tools. A historical overview covering four decades is possible thanks to the consistency of the survey framework based on Stonehill and Nathansons' initial work. Appendix [i] provides an overview of each item studied.

The robustness of the statistical methods employed and the quality of sampling is underlined in opposite findings published by researchers in the 1980s. This review shows for example that raising the level of criteria for inclusion in the survey will decrease the response rate.

Such surveys can be replicated across the globe, but with limited significance, as we have observed that American companies are more willing to respond than European ones.

Improvement in surveys has been made thanks to the spread of statistical analysis techniques; the latest ones providing statistically significant results throughout samples.

At this point, it appears that the biggest companies in the world can still improve their use of tools. Results clearly show that practice doesn't yet match academics' recommendations, in giving a preference to NPV or formalizing risk adjustment. There are however signs that let us believe we're on our way to bridging the gap between theory and practice. According to Graham and Campbell, 26% of managers have already adopted the sophisticated Real Options Analysis method. Compared to the adoption of DCF, and especially NPV, we can conclude herein an early adoption and hope that such innovations will continue to be pursued.

Glossary of Terms

	Term	Definition	Further Information
1.	ARR	Accounting Rate of Return	
2.	CAPM	Capital Asset Pricing Model	
3.	DCF	Discounted Cash Flow	
4.	FDI	Foreign Direct Investment	
5.	FWM	Firm Wealth Maximisation	European (excl. UK) and Japanese model of firms according to Moffet (2004).
6.	IRR	Internal Rate of Return	
7.	MNC	Multinational Corporation	
8.	NPV	Net Present Value	
9.	OECD	Organisation for Economic Cooperation and Development	www.oecd.org/
10.	PP	Payback Period	
11.	ROV	Real Options Valuation	
12.	SCV	Shareholder Value Creation	US and UK model of firms according to Moffet (2004).
13.	TNC	Transnational Company	Definition used by Shao & Shao (1993).
14.	WACC	Weighted Average Cost of Capital	

Appendices

[i] Comparative Table on Income Measurement Used by Companies

Source:	Stonehill & Nathanson (1968)	Oblak & Helm (1980)	Bavishi (1981)	Wicks Kelly & Philippatos (1982)	Kim, Farragher & Crick (1984)	Buckley, Buckley, Langevin & Tse (1996)	
Income Measurement:				Rule		Without exchange controls	With exchange controls
EARNINGS							
All earnings after foreign taxes	14%	22%		53%			
All earnings after foreign taxes available for repatriation				22%			
All earnings after foreign taxes, except when there are currency restrictions	2%	9%					
All expected accounting profits after foreign taxes, except where there are currency restrictions					6%		
All expected accounting profits after foreign taxes, regardless of currency					18%		
Book return on book investment	17%	14%					
Dividends expected to be remitted						3%	5%
Dividends expected to be remitted plus parent company fees, such as royalties, etc.						8%	14%
Expected return on book investment					14%		
Foreign profit after tax in local currency						14%	8%
Foreign profit before tax in local currency						13%	9%
Profit after tax in home currency						10%	5%
Profit before tax in home currency						6%	5%
Remittable profits and fees after host and home taxes in home currency						11%	17%
Remittable profits and fees after host tax in home currency						3%	5%
Remittance of profits and fees after host and home taxes in home currency						4%	9%
Remittance of profits and fees after host tax in home currency						3%	5%
CASH FLOWS (CF)							
All CF to the parent after foreign and domestic taxes	12%	27%		44%	26%		
All CF to the parent plus reinvested earnings, adjusted for foreign and domestic taxes	17%	24%		35%	23%		
All CF to the parent plus reinvested earnings, adjusted for foreign tax only	14%	3%		7%	12%		
CF: both foreign subsidiary's and US parent's viewpoint			37%				
CF: foreign subsidiary's viewpoint			42%				
CF: US parent's viewpoint			21%				
Discounted CF	11%						
Net CF to foreign business (subsidiary) after tax in local currency						37%	14%
Net CF to foreign business (subsidiary) before tax in local currency						6%	3%
OTHER	26%	1%		5%	1%	5%	5%

[ii] Comparative Table on Capital Budgeting Techniques

Source:	Oblak & Helm (1980)		Bavishi (1981)	Wicks Kelly & Philippatos (1982)	Stanley & Block (1983)		Kim, Farragher & Crick (1984)	Shao & Shao (1993)		Buckley, Buckley, Langevin & Tse (1996)		Drury & Tayles (1996)	Graham & Campbell (2001)
	Primary	Ancillary	Rule	Rule	Primary	2 nd ary	Rule	Primary	2 nd ary	Primary	2 nd ary	Often or always	Always or almost always
Accounting (book) rate of return	14%	33%	63%	32%	11%	15%	14%	17%	6%	10%	15%	41%	20%
Accounting (book) rate of return to subsidiary										10%	10%		
Adjusted present value								2%	6%				11%
Discounted payback period												42%	29%
Earnings multiple approach**													39%
Contribution to EPS (earnings per share)				18%									
Hurdle rate													57%
Internal rate of return	60%	21%	69%	47%	65%	15%	51%	38%	14%	41%	10%	57%	76%
Net present value	14%	36%	40%	13%	17%	30%	9%	12%	35%	31%	14%	43%	75%
Net present value to subsidiary										7%	5%		
Payback period	10%	62%	76%	22%	5%	38%	20%	28%	30%	27%	26%	63%	57%
Profitability index	2%	12%	10%				6%	3%	10%				11%
Return on sales				9%									
Sensitivity analysis (e.g. "good" vs. "fair" vs. "bad")													52%
Value-at-risk (VaR) or other simulation analysis													14%
We incorporate the "real options" of a project when evaluating it													27%
Other					2%	3%				4%	4%		

** P/E multiples – "a price-earning approach can be thought of as measuring the number of years it takes for the stock price to be paid for by earnings, and therefore can be interpreted as a version of the payback method."

[iii] Comparative Table on Discount Rate Determination

Source:	Stonehill & Nathanson (1968)	Oblak & Helm (1980)	Bavishi (1981)	Wicks Kelly & Philippatos (1982)	Kim, Farragher & Crick (1984)	Shao & Shao (1993)	Graham & Campbell (2001)
Discount rate determined by:				Rule			Always or almost always
Dividend growth model		16%				3%	16%
Capital Asset Pricing Model (CAPM)					9%	10%	73%
CAPM but including some extra "risk factors"		9%					34%
Cost of capital for overseas financing (either project or all overseas financing considered)			27%				
Cost of Debt		13%			17%	41%	
Cost of Equity						5%	
Determine discount rate subjectively/ on past experience		5%	30%		9%	9%	
Dividend growth model					11%		
Do not use cost of capital	21%						
Do not vary cost of capital	51%						
Parent cost of debt				6%			
Parent cost of equity				8%			
Parent WACC				51%			
Regulatory decisions							7%
Subsidiary cost of debt				8%			
Subsidiary cost of equity				6%			
Subsidiary WACC				22%			
Use cost of funds actually raised	7%						
Use local cost of capital	9%						
Use local prime interest rate	5%						
Vary cost of capital for overseas investment subjectively	5%						
WACC		54%			45%	30%	
WACC for worldwide financing			43%				
Whatever our investors tell us they require							14%
With average historic returns on common stock							39%
Other	3%	3%		14%	9%	3%	

[iv] Comparative Table on Risk Adjustment

Source:	Stonehill & Nathanson (1968)	Oblak & Helm (1980)	Bavishi (1981)	Wicks Kelly & Philippatos (1982)	Kim, Farragher & Crick (1984)	Buckley, Buckley, Langevin & Tse (1996) ^{***}	Graham & Campbell (2001)
Risk Adjustment				Rule		Ranked first	
Adjust ARR		19%			18%		
Adjust CF		7%				8%	26%
Borrow funds locally	6%	22%			21%		
Certainty Equivalent Approach			16%		8%		
Charge CF for cost of insuring risk even if not taken				6%			
Insure risk where possible	8%	9%		3%	12%		
No adjustment is made	5%	11%	14%	18%	7%		51%
Other methods	6%	5%		9%	4%	13%	
Sensitivity analysis						29%	
Subjective evaluation	45%		70%				
Vary cost of capital used in DCF analysis	5%	14%		26%			
Vary required PP	5%	13%		29%	18%	10%	
Vary required rate of return	36%			60%	12%	44%	22%

*** Only political risk is analysed.

Bibliography

- [1] Amram, Martha and Nalin Kulatilaka, "Real Options: Managing Strategic Investment in an Uncertain World," *Harvard Business School Press*, 1999
- [2] Atril, Peter, "Financial Management for Non-Specialists," 2nd edition, *Prentice Hall*, 2000
- [3] Bavishi V.B., (1981), "Capital budgeting practices at multinationals," *Management Accounting*, August, p. 32-35
- [4] Brealey, Richard A. and Stewart C. Myers, "Principles of Corporate Finance," 6th edition, *Irwin McGraw-Hill*, 2000
- [5] Buckley A., P. Buckley, P. Langevin, and K. Tse (1996), "The financial analysis of foreign investment decisions by large UK-based companies," *European Journal of Finance*, 2 (1996), p. 181-206
- [6] Charreaux, Gérard, "Images de l'investissement: au delà de l'évaluation financière, une lecture organisationnelle et stratégique," *Paris, Vuibert*, 2001, 421p., ouvrage collectif, see De Bodt, Eric et Bouquin, Henri, *Le controle de l'investissement*
- [7] Childs, Paul D., Steven H. Ott, and Alexander J. Triantis, "Capital Budgeting for Interrelated Projects: A Real Options Approach," *Journal of Financial and Quantitative Analysis*, 33(3), September 1998
- [8] Drury, Colin and Mike Tayles, "UK capital budgeting practices: some additional survey evidence," *European Journal of Finance*, 2 (1996), p. 371-388
- [9] Farragher, Edward J., Robert T. Kleiman, and Anandi P. Sahu, "Current Capital Investment Practices," *The Engineering Economist*, 44 (2) 1999, p. 137-150
- [10] Farrell, Michael, "Financial Engineering in project management," *Project Management Journal*, Sylva, Mar 2002
- [11] Graham, John R. and Harvey R. Campbell, "The theory and practice of corporate finance: evidence from the field," *Journal of Financial Economics* 60(2001), p. 187-243
- [12] Miller, Luke T. and Chan S. Park, "Decision making under uncertainty - real options to the rescue?" *The Engineering Economist*, 47(2), 2002
- [13] Oblak, D.J. and R.J. Helm Jr., (1980), "Survey and analysis of capital budgeting methods used by multinationals," *Financial Management*, Winter, p. 37-41
- [14] Shao L.P. and A.T. Shao, (1993), "Capital budgeting practices employed by European affiliates of US transnational companies," *Journal of International Financial Management*, 3(1/2), p. 95-109
- [15] Stanley M.T. and S.B. Block, (1983), "An empirical study of management and financial variables influencing capital budgeting decisions for multinational corporations in the 1980s," *Management International Review*, 23(3), p. 61-72
- [16] Stonehill A. and L. Nathanson, (1968), "Capital budgeting and the multinational corporation," *California Management Review*, Summer, p. 39-54
- [17] Trigeorgis, Lenos, "Real Options: Managerial Flexibility and Strategy in Resource Allocation," 4th printing, *The MIT Press*, 1999
- [18] Wicks Kelly M.E. and G.C. Philippatos, (1982), "Comparative analysis of the foreign investment evaluation practices by US-based manufacturing multinational companies," *Journal of International Business Studies*, 13(3), p. 19-42

Endnotes

¹ Terms used to describe the geographical and organisational scope of companies such as international, multinational, and transnational, have been borrowed from academic references such as Shao & Shao (1993). Precise definitions of these terms are beyond the scope of this paper.

² Surveys were held in Western Europe, the United States, and Japan.

³ Bodie Z. and R.Merton (2000), "Finance", *Prentice-Hall*

⁴ Brealey R., and S.Myers (2000), "Principles of Corporate Finance," 6th edition, *Irwin/McGraw Hill*

⁵ in Op. Cit., p.3

⁶ in Op. Cit., p.12

⁷ Albouy M. (2000), "Décisions Financières et Création de Valeur," *Economica*

⁸ Pesqueux Y. (2000), "Le gouvernement de l'entreprise comme idéologie," *Ellipses*

⁹ Eiteman D., A. Stonehill, and M. Moffet (2004), "Multinational Business Finance," 10th Edition, *Adisoo, Wesley/Pearson Education Inc.*

¹⁰ This is a consequence of the current and future financing decision. An etical posture is adopted here.

¹¹ Charreaux, Gérard et Al. (2001), "Image de l'Investissement, Au-delà de l'évaluation financière : une lecture organisationnelle et stratégique," *Vuibert coll. Fnege*

¹² Jensen M.C. (1993), "The Modern Industrial Revolution, Exit, and the Failure of Internal Control Systems," *The Journal of Finance*, vol. 48 :3, july, PP.831-880

¹³ Baskins J. and P.Miranti (1997), "A History of Corporate Finance," *Cambrodge University Press*

¹⁴ Schumpeter J., "History of Economical Analysis," 1954; cited by Baskins, op.cit.

¹⁵ The importance of history according to Schumpeter: (1) It is a unique process in historic time. Understanding present and epoch require a historical experience, together with a sense of history and a collection of facts, (2) A Historical report must combine qualitative as well as quantitative facts and how they are inter-related, (3) Lack of historical experience is a primary source of error, and shortcomings of the economist's tools can only be secondary.

¹⁶ Stonehill A. and L. Nathanson, (1968), "Capital budgeting and the multinational corporation," *California Management Review*, Summer, p. 39-54

¹⁷ Farragher, Edward J., Robert T. Kleiman and Anandi P. Sahu (1999), "Current Capital Investment Practices," *The Engineering Economist*, 44 (2), p. 137-150

¹⁸ Graham, John R. and Harvey R. Campbell (2001), "The theory and practice of corporate finance: evidence from the field," *Journal of Financial Economics* 60, p. 187-243

¹⁹ See next reference.

- ²⁰ Shao L.P. and A.T. Shao, (1993), "Capital budgeting practices employed by European affiliates of US transnational companies," *Journal of International Financial Management*, 3(1/2), p. 95-109
- ²¹ Wicks, Kelly M.E. and G.C. Philippatos, (1982), "Comparative analysis of the foreign investment evaluation practices by US-based manufacturing multinational companies," *Journal of International Business Studies*, 13(3), p. 19-42
- ²² Stanley M.T. and S.B. Block, (1983), "An empirical study of management and financial variables influencing capital budgeting decisions for multinational corporations in the 1980s," *Management International Review*, 23(3), p. 61-72
- ²³ Drury, Colin & Mike Tayles (1996), "UK capital budgeting practices: some additional survey evidence," *European Journal of Finance*, 2, p. 371-388
- ²⁴ Graham, John R. and Campbell, Harvey R. (2001), "The theory and practice of corporate finance: evidence from the field," *Journal of Financial Economics* 60, p. 187-243
- ²⁵ Buckley A., P. Buckley, P. Langevin, and K. Tse (1996), "The financial analysis of foreign investment decisions by large UK-based companies," *European Journal of Finance*, 2 (1996), p. 181-206
- ²⁶ Op. cit.
- ²⁷ See Hatchuel, op. cit.
- ²⁸ Markowitz H., "Portfolio Selection," *The Journal of Finance*, March 1952
- ²⁹ Stonehill A. and L. Nathanson, (1968), "Capital budgeting and the multinational corporation," *California Management Review*, Summer, p. 39-54
- ³⁰ Including reinvested earnings adjusted for foreign and domestic taxes or earnings adjusted for foreign taxes only.
- ³¹ Lintner J., (1965) "Security Prices, Risk, and Maximal Gains from Diversification," *The Journal of Finance*, 20
- ³² An efficient market, according to Brealey & Myers (2003, pp 363 – 370) can be characterised by six lessons.
- ³³ Fama E., (1970), "Efficient Capital Markets : A review of Theory and Empirical Work," *Journal of Finance* 25, 383-417
- ³⁴ The finance theory then recommended that :
- When using the foreign subsidiary's viewpoint , it should be assumed that unremitted earnings will be reinvested in the host country. If blocked, then effective remittable earnings under the host country laws (i.e. maximum amount of dividend, management fees and royalties allowed), should be used when measuring income from the parent perspective.
 - DCF methods, i.e. IRR or NPV should be used for analyzing project cash flows. MNCs should use their marginal worldwide weighted average cost of incremental capital for evaluating investment projects, including the US parent company's domestic liabilities as well as debts of all foreign subsidiaries. All debt of all foreign subsidiaries is included.

- The allowance for risk should be done in either of two ways: certainty equivalent cash flows in which project cash flows risk-adjusted discount rates.

³⁵ Bavishi V.B., (1981), "Capital budgeting practices at multinationals," *Management Accounting*, August, p. 32-35

³⁶ Stanley M.T. and S.B. Block, (1983), "An empirical study of management and financial variables influencing capital budgeting decisions for multinational corporations in the 1980s," *Management International Review*, 23(3), p. 61-72

³⁷ Kim S., T. Crick and E. Farragher, (1984), "Foreign Capital Budgeting Practices Used by the US and Non-US Multinational Companies," *The Engineering Economist*, vol 29 : 3, PP. 207-216

³⁸ See Brealey & Myers (2000).