# NON-PRICE DECISIONS THE FIRM IN A MODERN CONTEXT

A. KOUTSOYIANNIS

Professor of Economics University of Waterloo, Ontario, Canada

M

# Contents

**INTRODUCTION** 

#### PART ONE

# PRODUCT AND ADVERTISING DECISIONS

2

xix

1.	PROD	UCT AS A MARKET WEAPON	5
	I.	Definitions and Historical Notes	5
		A. Relationship of 'Product' with Other Policy Variables	5
		B. 'Product' as a Multidimensional Variable	7
		C. The Literature on Product Competition	9
		D. Types of Quality Variation or Product Competition	10
		(i) Vertical quality variation	11
		(ii) Horizontal quality variation	11
		(iii) Innovational quality variation	11
	II.	Models of Product Competition in the 'Neoclassical' Theory	
		of the Firm	12
		A. A Model of Vertical Quality Competition with Profit	
		Maximisation	12
		(i) Assumptions of the model	12
		(ii) Short-run equilibrium	13
		(iii) Long-run equilibrium	18
		B. A Model of Horizontal Quality Competition	20
		(i) Assumptions of the model	20
		(ii) Short-run equilibrium	22
		(iii) Long-run equilibrium	25
	III.	Managerial Models of Product Competition	27
		A. Vertical Quality Equilibrium with Sales Maximisation	27
		B. Vertical Quality Competition with Aggressive Sales	
		Maximisation: a Model of Cut-throat Product Competition	29
		C A Model of Assurative Heninesetal Commentities	20 -

30 C. A Model of Aggressive Horizontal Competition

	IV.	Soi	me Remarks on Maximising Models of Product Competition	33
	V.	Αŀ	Behavioural Model of Product Strategy	35
		А.	Determinants of the Degree of Involvement of Top	
			Management in the Strategic Decisions	38
		B.	Types of Strategic Change (or Growth)	39
		C.	Stages of Strategic (Product) Change	41
		D.	Critique of Ansoff's Behavioural Model	43
	VI.	De	terminants of Product Variation	44
		А.	Factors related to the Demand for the Product	44
		В.	Factors related to the Production of the Commodity	45
		C.	Factors related to the Internal Structure of the Firm	46
		D.	Factors related to the Environment of the Firm	46
	VII.	Eff	ects of Product Variation on Market Conduct and	
		Per	formance	47
		Α.	Product Competition and Quality Standards	47
		B.	Product Diversity and Technical Progress	48
		С.	Product Diversity and Consumers' Expenditure	48
		D.	Product Variation and Industry Concentration	48
		E.	Product Variation and Competition	49
		F.	Product Variation and Price Competition	49
		G.	Product Variation and Economies of Scale	50
2.	THE	ADV	ERTISING DECISION OF THE FIRM	
	I.	Int	roductory Remarks	51
		A.	Advertising as a Weapon of Competition	51
		B.	Advertising Expenditures	52
		C.	Advertising by Media	53
		D.	Advertising Expenditures by Product	56
	II.	Ma	rginalistic, Profit-Maximising Models of the Advertising	
		Dee	cision	58
		А.	A Simple Model of the Advertising Decision	59
			Mathematical presentation of the simple advertising	
			model	61
			Advertising as a rule of thumb	65
		B.	Buchanan's Advertising-Price Model	67
			Short-run equilibrium in Buchanan's model	68
			The shape and position of the AAOC curve	71
			The shape and position of the AAOR curve	73
			The relationship between the AAOC and AAOR curves	74
			The marginal curves in Buchanan's model	75
			Long-run equilibrium in Buchanan's model	77
			Critique of Buchanan's model	78
		C.	A Note on Advertising as an Investment	79

#### Contents

	D. The Dorfman-Steiner Mathematical Version of the	
	Price-Advertising Model	80
	E. A 'Generalised' Model, with Price, Style-Variety and	
	Advertising Simultaneously Determined	84
	F. Schmalensee's Model of Oligopoly Advertising	86
III.	A Managerialist Model of Advertising: The Baumol-Hawkins-	-
	Bushnell–Kafoglis Static Model	90
	A. A Diagrammatic Presentation of the Model	90
	The basic assumptions of the static model	90
	Equilibrium of the firm	91
	B. A Mathematical Presentation of Baumol's Model	92
IV.	A Model of Advertising Barriers: Williamson's Model of	
	Advertising as an Entry-prevention Strategy	99
	A. The Equilibrium Conditions	99
	B. The 'Tools' of the Model	100
	(i) The 'line-constraint'	100
	(ii) Isoquants on the price-advertising space	101
	C. The Equilibrium of the Firm	106
•	The set of feasible solutions: the shape and position	
	of isoprofit curves	107
V.	Distributed-lag Models of the Advertising Decision: Nerlove's	
	Stock-adjustment Hypothesis and Koyck's Geometric Lag	113
VI.	Empirical Studies of the Advertising Decision	115
	A. Melrose's Study	116
	B. Schmalensee's Study	117
	C. Bass's Study	117
	D. Bass and Parsons's Study	118
VII.	Effects of Advertising	118
	A. Advertising and Concentration	119
	B. Advertising, Barriers to Entry, and Profitability	122
	C. Advertising and Prices	128
	D. Advertising as a Subsidy to the Mass Communications Media	133
	E Advertising and the Quality of Products	134
	F Advertising and Innovation	134
	G Excessive Advertising and the Waste of Resources	135
	H Advertising and Consumer Demand	137
	(i) Industry studies	138
	(i) Firm and brand studies	141
	(iii) Product studies	143
	I. Advertising and Consumers' Sovereignty	144
	J. Advertising and Social Priorities	145
	K. Advertising and Interdependence of Consumers' Utility	146

### PART TWO

# THE GROWTH DECISION OF THE FIRM

	INTR	ODU	JCTION	150
3.	BASI	с со	NCEPTS IN VALUATION THEORY	155
	I.	Th	e Goal of Maximisation of the Value of the Firm	155
		Α.	The Rationale of the Maximisation of the Value of the	
			Firm	155
		В.	Profit Maximisation versus Market Value of Equity	
			Maximisation	157
	II.	Bas	sic Concepts in Valuation Theory	157
		Α.	Compound Value (or Future Value or Terminal Value)	158
		B.	Present Value (Discounting)	159
			(i) Present value of a future amount of money	159
			(ii) Present value of a stream of earnings	160
			(iii) Present value of an annuity	160
			(iv) Present value of an infinite stream of earnings	161
			(v) Present value of a perpetuity	162
		С.	Relation between Present Value and Compound	
			(or Future) Value	163
		D.	Estimating Compound Rates or Discount Rates	163
			(i) Compound rates	163
			(ii) Discount rates	164
		E.	Yield (or Internal Rate of Return)	164
		F.	Certainty and the 'Time Value of Money'	166
		G.	Risk and its Measurement	166
			(i) The probability distribution of an uncertain stream	
			of earnings	166
			(ii) Business risk and its measurement	168
			(iii) Financial risk and its measurement	174
	III.	Sto	ock Valuation Models	176
		Α.	The General Dividends Model	176
		B.	The Constant Dividend Stream Model	179
		C.	The Constant Growth (or the Gordon–Shapiro)	
			Model of Valuation	180
		D.	General Growth Models	181
		E.	A Note on the Determinants of the Discount Rate $k_e$	181
	Append	lix 3.	1 Introduction to the Theory of Portfolio Selection	
		(Inte	ertemporal Allocation of Income or Resources)	182
		A.	Portfolio Selection by Individuals	183
			Assumptions	183
			The indifference map of the investor	183

١

Contents
----------

		The investor's opportunity locus	185
		Extension of the certainty model of portfolio selection	
		to a <i>t</i> -period time horizon	189
		B. Optimal Portfolio Selection by Firms under Certainty	191
		The single-owner firm	191
		The multi-owner corporation	195
App	endix 3	.2 Mathematical Tables	199
	Table	1 Compound Value of \$1 (CVIF)	200
	Table	2 Present Value of \$1 (PVIF)	202
	Table	3 Compound Value of an Annuity of \$1	204
	Table	4 Present Value of an Annuity of \$1	206
4.	THE I	NVESTMENT DECISION OF THE FIRM UNDER	
	CERT	AINTY	208
	I.	Types of Investment	209
·		A. Replacement Investment and New Investment	209
	•	B. Independent and Dependent Investment Projects	209
•		C. Mutually Exclusive Investment Projects	210
		D. Conventional and Non-Conventional Investments	210
	II.	The Investment Decision Using the Internal Rate of Return	
		Approach (or the Marginal Efficiency of Investment)	210
		A. The Demand for Capital Goods Schedule	210
		B. The Supply-of-Funds Schedule of the Firm	214
		C. The Investment Decision on the Basis of the IRR	215
	III.	The Investment Decision using the Net Present Value (NPV)	
		Criterion	216
	IV.	A Comparison of the IRR and NPV Approaches	219
		A. Conventional, Independent Investments	219
		B. Mutually Exclusive Investments	222
		C. Multiple Internal Rates of Return	224
	V.	The Payback Method for Investment Decisions	227
5.	GROW	TH BY MERGER AND TAKEOVER	229
	I.	Introduction	229
		A. Preliminary Remarks	229
		B. Distinction between Mergers and Takeovers	229
		C. Historical Notes: Merger Waves	230
	II.	Mergers and the Profit-maximisation Hypothesis	231
		A. Effects of a Merger on Expected Earnings, $\overline{X}$	233
		(i) Increase in market power	233
		(ii) Economies of scale and expected earnings	236
		(iii) Fast growth and expected earnings, $\overline{X}$	238
		B. Tax Effects on the Merged Firm	238

	C. Effects of Mergers on Risk and on Investors' Discount	
	Rate	239
	D. Effects from Increased Debt Capacity	242
III.	Mergers and the Valuation-Discrepancies Hypothesis	243
	A. Manipulative Effects of Expectations of Investors	244
	B. Valuation Discrepancies of Expected Earnings	246
	C. Differences in the Discount Rates of Stockholders of	
-	Acquiring and Acquired Firms	248
IV.	Mergers and the Growth-maximisation Hypothesis: Mueller's	
	Model of Conglomerate Mergers	249
V.	Empirical Evidence	255
	A. Studies of the Profitability of Mergers	256
	B. Gort's Test of the Valuation-Discrepancies Theory of	_
	Merger	262
	(i) The test of the 'valuation-discrepancies' hypothesis	262
	(ii) The test of the 'monopoly-power' hypothesis	264
<i>i</i>	(iii) The test of the 'economies-of-scale' hypothesis	265
	C. Studies of the Characteristics of Acquired versus	
;	Non-Acquired Firms	267
	(i) Kuehn's study	268
	(ii) Singh's study	271
	D. Observed Facts and their Compatibility with the	
	Competing Hypotheses	275
6 GROW	TH BY VERTICAL INTEGRATION	278
U. URUN	Basic Concents and Definitions	278
1.	A Types of Vertical Integration	278
	B Measures of Vertical Integration	279
П	The Determinants of the Decision to Grow by Vertical	2.7
	Integration	280
	A Economies of Vertical Integration	280
	B. Reduction of Uncertainty in Input Markets	281
	C. Reduction of Uncertainty in the Product Market	282
	D. Attaining Monopoly Power in the Product Market	282
/	E. Attaining Monopoly Power in Input Markets	282
	F. Creation or Intensification of Barriers to Entry	283
III.	Theory of Transfer Pricing	284
	A. Model 1: There is no External Market for the Intermediate	
	Product of the Firm, which has only One Final-Product	
	Division	285
	(i) Assumptions.	285
	(ii) The transfer price is set by the final-product division	288
	(iii) The transfer price is set by the producing division	289

# Contents

		B.	Model 2: There is no External Market for the Intermediate	
			Product, which is Sold to Two Final-Product Divisions with	201
		~	Interdependent Demands	291
		С.	Model 3: There is a Perfectly Competitive External	007
		D	Market for the Intermediate Product of the Firm	296
		D.	Model 4: There is an Imperfectly Competitive External	200
	** 7	<b>71</b> 1	Market for the Intermediate Product of the Firm	298
	IV.	Ine	Decision to Close Down a Particular Division	302
		A.	Abandonment of a Final-Product Division	302
		В.	Partial or Complete Abandonment of the Supplier	204
	v	Eff	Division Dete of Vertical Integration	304
	v.		Vertical Integration Market Foreelooure and Concentre	305
		А.	tion	205
		р	Vortical Integration and Entry Parriers	305
		Б.	(i) Product differentiation	306
			(i) Absolute cost advantage	306
			(ii) Absolute cost advantage	306
			(iii) Absolute capital requirements	307
		C	(iv) Scale Dallier Vertical Integration and Cost Structure	307
		С. р	Vertical Integration and Pricing Pahaviour	,308
		D.	ventical integration and Fricing behaviour	308
7.	GROW	/TH	BY FOREIGN DIRECT INVESTMENT: THE	
	DECIS	SION	TO INVEST ABROAD	310
	I.	Int	roduction	310
		Α.	Types of Foreign Direct Investment	310
		В.	Alternatives to Foreign Direct Investment	311
	II.	Cau	uses of Foreign Direct Investment	312
		А.	Preliminary Remarks	312
		В.	Causes of Horizontal Foreign Investment	314
			(i) The 'specific-advantage' hypothesis	314
			(ii) The 'capital-abundance' hypothesis	316
			(iii) The 'research and development' hypothesis	317
			(iv) The 'barriers to entry' hypothesis	318
			(v) The 'tariff' hypothesis	318
			(vi) The 'lower production costs' hypothesis	320
			(vii) The 'foreign government inducements' hypothesis	321
			(viii) The 'multinational fad' hypothesis	322
			(ix) Vernon's 'product-cycle' hypothesis	322
			(x) Richardson's generalised model of foreign direct	
			investment	328
		C.	Causes of Vertical Foreign Investment	347
			(i) Economic factors influencing vertical foreign	
			investment	347

¢ `

	(ii) Richardson's model for vertical integration by foreigr	ı
	direct investment	349
Eco	onomic Effects of Foreign Direct Investment	351
Α.	Benefits to the Host Country	351
	(i) Corporate income tax	352
	(ii) Improvement in the skills of the labour force	352
	(iii) Increase in the productivity of factor resources	353
	(iv) Improvement in the allocation of resources	354
	(v) Speeding-up of technical progress	354
B.	Market Structure and Market Conduct	356
·Em	pirical Evidence	359
Α.	Studies of the Characteristics of the Firms which Under-	
	take Foreign Direct Investment	360
B.	Studies of the Causes of Foreign Direct Investment	361
C.	Tests of the 'Product-Cycle' Hypothesis	363
Ď.	Studies of the Effects of Foreign Direct Investment	365
	Ecc A. B. Em A. B. C. D.	<ul> <li>(ii) Richardson's model for vertical integration by foreigr direct investment</li> <li>Economic Effects of Foreign Direct Investment</li> <li>A. Benefits to the Host Country <ul> <li>(i) Corporate income tax</li> <li>(ii) Improvement in the skills of the labour force</li> <li>(iii) Increase in the productivity of factor resources</li> <li>(iv) Improvement in the allocation of resources</li> <li>(v) Speeding-up of technical progress</li> </ul> </li> <li>B. Market Structure and Market Conduct</li> <li>Empirical Evidence</li> <li>A. Studies of the Characteristics of the Firms which Undertake Foreign Direct Investment</li> <li>B. Studies of the Causes of Foreign Direct Investment</li> <li>C. Tests of the 'Product-Cycle' Hypothesis</li> <li>D. Studies of the Effects of Foreign Direct Investment</li> </ul>

#### PART THREE

# THE FINANCING DECISIONS OF THE FIRM

	INTR	ODUCTION	370
8.	THE C	CAPITAL STRUCTURE OF THE FIRM: THE LEVERAGE	
	DECIS	SION	372
	I.	The Capital Structure of Firms Under the Assumption that	
		the Goal of Managers is Stockholder-Wealth Maximisation	373
		A. Durand's Valuation Hypotheses	376
		(i) The net income (NI) approach	377
		(ii) The net operating income (NOI) approach	377
		B. The 'Traditionalist' Approach	378
		(i) The Modigliani and Miller summary of the	
		traditionalist view	379
		(ii) Solomon's 'revised traditionalist approach' to	
		valuation	380
		C. The ModiglianiMiller Approach Without Taxes	381
		D. The Modigliani-Miller Hypothesis With Corporate Taxes	390
	- II.	A Managerial Theory of Capital Structure	395
	III.	The Leverage Decision in Practice	396
		A. EPS-EBIT Analysis	397
		B. Cash-Flow Analysis	399
	IV.	Factors Determining the Capital Structure	400
	V.	Empirical Evidence on the Leverage Decision	404
		A. Weston's Study	404
		B. Barges's Study	405

		C.	Wippern's Study	406
		D.	The Modigliani-Miller 1966 Study	409
		E.	A Test of the Managerial Theory of Capital Structure	411
9.	THE I	DIVI	DEND-RETENTION DECISION OF THE FIRM	414
	I.	The	cories of the Dividend-Retention Decision when the Goal	
		of t	he Firm is Stockholder-Wealth Maximisation	415
		Α.	The Modigliani-Miller 'Dividend-Irrelevancy' Hypothesis	415
			(i) A model with all-equity firms	417
			(ii) A 'generalised model' with debt and equity financing	420
		В.	Market Imperfections and the Modigliani-Miller Model	423
			(i) Heterogeneous expectations of investors	423
			(ii) Tax effects	424
			(iii) Transactions costs and uncertainty of capital gains	426
			(iv) Flotations costs	427
		C.	Myron Gordon's 'Increasing Discount Rates' Hypothesis	428
		D.	The 'Preference for Current Income' Hypothesis	429
		E.	The 'Informational Content of Dividends' Hypothesis	429
		F.	The 'Traditionalist' Theory of the Dividend Decision	430
		G.	The 'Residual Theory' of Dividends	432
	II.	A N	Managerial Theory of the Dividend-Retention Decision:	
		The	e 'Managerial Job-Security' Hypothesis	436
	III.	The	e Determinants of the Dividend Policy of the Firm	438
	IV.	Em	pirical Evidence on the Determinants of the Dividend-	
		Pay	out Decision	442
		Α.	The Modigliani-Miller 1966 Study	442
		B.	Gordon's Study of the Dividend Effect	443
		C.	The Study of Friend and Puckett	445
		D.	Brigham's and Gordon's 'Joint-Test' Study	452
		E.	A Test of the Managerial Theory of the Dividend Decision	455
10.	THE	COST	<b>I OF CAPITAL TO THE FIRM</b>	458
	I.	The	e Cost of the Different Sources of Funds	460
		Α.	The Conventional Method of Estimating the Cost of	
			Capital for Specific Sources of Funds	460
			(i) The cost of debt $(k_d)$	460
			(ii) Cost of new common stock or cost of equity	
			capital $(k_e)$	463
		р	(iii) Cost of retained earnings $(k_R)$	466
		В.	An Alternative Method for Estimating the Cost of	
			Specific Sources of Funds	469
			(1) Definitions and relationships	469
			(ii) The cost of pure equity financing of a levered firm	. —
			$(C_E)$	472

	(iii) The cost of pure debt financing of a levered firm	
	$(C_D)$	472
	(iv) The cost of retained earnings $(C_R)$	472
11.	Optimal Capital Structure and the Weighted Average Cost of	
	Capital	476
	A. The Theory of Optimal Capital Structure Revisited	476
	B. Determination of the 'Target' Capital Structure in	
-	Practice	479
	C. An Illustration of the Estimation of the Cost of Capital	
	in the Real World	481
III.	The Supply-of-Funds Schedule of the Firm	485
	A. Derivation of the Supply-of-Funds Schedule	485
	B. The Rationale of Using the Weighted Average Cost of	
	Capital (WACC) in Investment Decisions	493
Appendix	Cost of Preferred Stock $(k_p)$	495

### PART FOUR

# THE INVESTMENT DECISION UNDER RISK AND UNCERTAINTY

Ļ

	INTR	ODUCTION	498
11.	THE 1	TRADITIONAL THEORY OF THE INVESTMENT	
	DECIS	SION UNDER RISK AND UNCERTAINTY	501
	I.	Preliminary Remarks	501
		A. Risk and Uncertainty	501
		B. Sources of Noncertainty	502
	П.	Information Required for the Evaluation of Risky Proposals	504
		A. The Probability Distribution of the Earnings of a Single-	
		Period Project	504
		B. The Probability Distribution of the Earnings of a Multi-	
		Period Project	512
		(i) The mean of the uncertain stream of earnings	513
	- 7	(ii) The standard deviation of the stream of uncertain	
		earnings	517
.0	3	(iii) The coefficient of variation as a measure of risk	522
		C. Risk Attitudes of Decision-Makers	524
// n	III.	Traditional Models of Optimal Investment Decisions Under	
ય્		Risk	529
		A. Maximisation of Expected Earnings	530
		B. The 'Certainty-Equivalents' Model	530

#### Contents 🕚

	C.	Risk-Adjusted Discount Rates	536
		(i) Defining risk classes for investments	540
		(ii) Use of the firm's weighted average cost of capital as	
		the risk-adjusted discount rate	541
		(iii) Use of the weighted average cost of capital of	
		another firm as the discount rate	542
		(iv) Discount rates found from the risk-return trade-off	
-		curve of the decision-maker	542
	D.	Maximisation of Expected Utility	544
	E.	The Weighted Average Cost of Capital Model	546
		(i) The MEI schedule under risk	546
		(ii) The supply-of-funds schedule, $S_F$	549
IV.	Crit	eria for Decision-Taking Under Uncertainty	555
	А.	Dominance and Admissibility of a Project (Strategy)	556
	B.	The Bayes-Laplace Criterion	557
	С.	The Maximin Criterion	558
	D.	The Minimax Criterion	
-	E.	The Maximax Criterion	559
*	F.	The Hurwicz Criterion	560
	G.	The Minimax-Regret Criterion	561
Appendix 1	1.1	Objective vs Subjective Probabilities	564
Appendix 1	1.2	The Standard Normal Variable $Z$ and its use in Measuring	
		Risk	569
	A.	The Use of the Z-Table	-569
	B.	Finding the Probability of Values of any Normal Variable.	
		X, with the Use of the Z-Table	572
	C.	Using the Z-Table to Estimate the Risk of a Project	573
	D.	Some Basic Results of the Standard Normal Distribution	574

12.	MODERN THEORY OF THE INVESTMENT DECISION UNDER				
	RISK			576	
	I.	Int	roduction to the Theory of Portfolio Selection Under Risk	576	
		Α.	Measurement of the Return and Risk of a Portfolio	577	
	-	B.	The Mean–Variance Model of Portfolio Selection	580	
			(i) Assumptions of the model	580	
			(ii) The investor's indifference map	581	
			(iii) The efficient opportunity frontier of two-asset		
			portfolios	583	
			(iv) Equilibrium of the investor: choice of the optimal		
			portfolio within the two-asset model	593	
			(v) Portfolio selection in the <i>n</i> -asset model	594	

II. The Firm–Portfolio Approach to the Investment Decision	n:	
Application of the Mean-variance Model to the investme	ent 600	
Decision of the Firm	600	
A. The Efficient Fiontier of Portionos of Fixed Assets	600	
B. The Managers multification	606	
C. The Optimal Investment Decision	000	
Traditional Theory of Single Project Evaluation	607	
III The Stockholder Portfolio Approach to the Investment	007	
Decision: The Capital Asset Pricing Model (CAPM)	600	
$\Lambda$ The Assumptions of the CAPM	610	
$\mathbf{R}$ The Ress (3) Coefficient of a Security	611	
<b>D.</b> The Deta $(p)$ Coefficient of a Security	613	
D. The Capital Market Line (CML)	615	
E The Beta Coefficient and the Security Market Line	616	
E. The Beta coefficient and the Security Market Line E Diversification and the Reduction of the Risk of a	010	
Portfolio	617	
G Relaxing the Assumptions of the CAPM	622	
H Using the CAPM to Estimate the Cost of Equity Capi	625	
I. The Application of the CAPM to the Investment Dec	ision 626	
Appendix 12.1 The Mathematical Foundation of the Mean–Variance	e	
Model	630	
A. The Utility of the Investor Depends only on the Mean	n	
Return and the Variance of the Earnings Distribution	632	
B. The Positive Slope of the Investor's Indifference Curv	ve 634	
Appendix 12.2 The Algebra of Expected Values	635	
CONCLUDING REMARKS	640	
SELECT BIBLIOGRAPHY	642	
AUTHOR INDEX		
SUBJECT INDEX	659	

----

.