Peter Brusov • Tatiana Filatova • Natali Orekhova • Mukhadin Eskindarov

Modern Corporate Finance, Investments, Taxation and Ratings

Second Edition



Contents

Par	t I	Corporate Finance				
1		roduction	3			
	KCI	Diction Co.				
2	Cap	ital Structure: Modigliani-Miller Theory	9			
	2.1	Introduction	9			
	2.2	The Traditional Approach	10			
	2.3	Modigliani–Miller Theory	11			
		2.3.1 Modigliani–Miller Theory Without Taxes	11			
		2.3.2 Modigliani–Miller Theory with Taxes	13			
		2.3.3 Main Assumptions of Modigliani–Miller Theory	16			
		2.3.4 Modifications of Modigliani–Miller Theory	17			
	Refe	erences	27			
3	Modern Theory of Capital Cost and Capital Structure:					
		sov-Filatova-Orekhova Theory (BFO Theory)	29			
	3.1	Companies of Arbitrary Age and Companies with Arbitrary				
		Lifetime: Brusov–Filatova–Orekhova Equation	30			
	3.2	•				
		with Myers Results (1-Year Company) and Brusov–Filatova–				
		Orekhova Ones (Company of Arbitrary Age)	32			
	3.3	Brusov–Filatova–Orekhova Theorem	36			
	3.4	From Modigliani–Miller to General Theory of Capital Cost				
		and Capital Structure	40			
	3.5	BFO Theory in the Case, When the Company Ceased to Exist				
	0.0	at the Time Moment <i>n</i> (BFO-2 Theory)	43			
		3.5.1 Application of Formula BFO-2	44			
		3.5.2 Comparison of Results Obtained from Formulas BFO				
		and BFO-2	46			

xiv Contents

	3.6 Conclusions4References4	
4	Bankruptcy of the Famous Trade-Off Theory	1 4 5 4
	References	6
5	New Mechanism of Formation of the Company's Optimal CapitalStructure, Different from Suggested by Trade-Off Theory95.1 Absence of Suggested Mechanism of Formation of the Company's Optimal Capital Structure Within Modified Modigliani-Miller Theory (MMM Theory)95.2 Formation of the Company's Optimal Capital Structure Within Brusov-Filatova-Orekhova (BFO) Theory105.3 Simple Model of Proposed Mechanism115.4 Conclusion11References11	9 0 3 .5
6	The Global Causes of the Global Financial Crisis11References12	
7	The Role of Taxing and Leverage in Evaluation of Capital Cost andCapitalization of the Company127.1 The Role of Taxes in Modigliani–Miller Theory127.2 The Role of Taxes in Brusov–Filatova–Orekhova Theory127.2.1 Weighted Average Cost of Capital (WACC) of the Company137.2.2 Equity Cost k_e of the Company137.2.3 Dependence of WACC and k_e on the Age of Company13	0 2
	7.3 Conclusions 13 References 13	8
8	A Qualitatively New Effect in Corporate Finance: Abnormal Dependence of Equity Cost of Company on Leverage	·1 ·1

Contents xv

		8.3.2 Dependence of Equity Cost $k_{\rm e}$ on Leverage Level	
		L (the Share of Debt Capital w_d) at Different Fixed Tax	
		on Profit Rate <i>T</i>	148
	8.4	Dependence of the Critical Value of Tax on Profit Rate T^*	
		on Parameters n, k_0 , and k_d of the Company	150
	8.5	Practical Value of Effect	153
	8.6	Equity Cost of a 1-Year Company	154
	8.7	Conclusions	157
	Refe	rences	158
9	Infla	ntion in Brusov–Filatova–Orekhova Theory and in Its	
		petuity Limit Modigliani–Miller Theory	161
	9.1	Introduction	161
	9.2	Accounting of Inflation in the Modigliani–Miller Theory	
		Without Taxes	162
	9.3	Accounting of Inflation in Modigliani–Miller Theory	
		with Corporate Taxes	166
	9.4	Accounting of Inflation in Brusov–Filatova–Orekhova Theory	
		with Corporate Taxes	168
		9.4.1 Generalized Brusov–Filatova–Orekhova Theorem	168
	9.5	Generalized Brusov-Filatova-Orekhova Formula Under	
		Existence of Inflation	169
	9.6	Irregular Inflation	176
	9.7	Inflation Rate for a Few Periods	177
	9.8	Conclusions	178
	Refe	erences	179
Par	t II	Investments	
10	A Po	ortfolio of Two Securities	183
	10.1	A Portfolio of Two Securities	183
		10.1.1 A Case of Complete Correlation	183
		10.1.2 Case of Complete Anticorrelation	185
		10.1.3 Independent Securities	186
		10.1.4 Three Independent Securities	188
	10.2	Risk-Free Security	191
	10.3	Portfolio of a Given Yield (or Given Risk)	193
		10.3.1 Case of Complete Correlation ($\rho_{12} = 1$)	
		and Complete Anticorrelation $(\rho_{12} = -1) \dots \dots$	194
	Refe	erences	195
11	Inve	estment Models with Debt Repayment at the End of the Project	
		Their Application	197
	11.1		197
	11.2		
		from the Perspective of the Equity Holders Only	198
		11.2.1 With the Division of Credit and Investment Flows	198

xvi Contents

	11.3	Without Flows Separation	200
	11.4	Modigliani–Miller Limit (Perpetuity Projects)	201
		11.4.1 With Flows Separation	201
		11.4.2 Without Flows Separation	202
	11.5	The Effectiveness of the Investment Project	
		from the Perspective of the Owners of Equity and Debt	203
		11.5.1 With Flows Separation	203
		11.5.2 Without Flows Separation	204
	11.6	Modigliani–Miller Limit	205
		11.6.1 With Flows Separation	205
		11.6.2 Without Flows Separation	206
	Refer	rences	207
10	т п		
12		ence of Debt Financing on the Efficiency of Investment	
		ects: The Analysis of Efficiency of Investment Projects	200
		in the Perpetuity (Modigliani–Miller) Approximation	209
	12.1	The Effectiveness of the Investment Project	
		from the Perspective of the Equity Holders Only	209
		12.1.1 With the Division of Credit and Investment Flows	209
		12.1.2 Without Flows Separation	217
	12.2	The Effectiveness of the Investment Project	
		from the Perspective of the Equity and Debt Owners	225
		12.2.1 With the Division of Credit and Investment Flows	225
		12.2.2 Without Flows Separation	233
	Refer	rences	241
13	The	Analysis of the Exploration of Efficiency of Investment	
13		ects of Arbitrary Duration (Within Brusov–Filatova–	
		hova Theory)	243
	13.1	The Effectiveness of the Investment Project	243
	13.1	from the Perspective of the Equity Holders Only	243
		13.1.1 With the Division of Credit and Investment Flows	243
	10.0	13.1.2 Without Flow Separation	250
	13.2	The Effectiveness of the Investment Project	250
		from the Perspective of the Owners of Equity and Debt	258
		13.2.1 With the Division of Credit and Investment Flows	258
		13.2.2 Without Flow Separation	266
	13.3	The Elaboration of Recommendations on the Capital Structure	
		of Investment of Enterprises, Companies, Taking into Account	
		All the Key Financial Parameters of Investment Project	273
		13.3.1 General Conclusions and Recommendations on the	
		Definition of Capital Structure of Investment of	
		Enterprises	273
	Refer		275

Contents xvii

14	Inves	stment Models with Uniform Debt Repayment and Their	
	Appl	ication	277
	14.1	Investment Models with Uniform Debt Repayment	277
	14.2	The Effectiveness of the Investment Project	
		from the Perspective of the Equity Holders Only	279
		14.2.1 With the Division of Credit and Investment Flows	279
		14.2.2 Without Flows Separation	280
	14.3	The Effectiveness of the Investment Project	
		from the Perspective of the Owners of Equity and Debt	281
		14.3.1 With Flows Separation	281
		14.3.2 Without Flows Separation	281
	14.4	Example of the Application of the Derived Formulas	282
	14.5	Conclusions	283
	Refer	ences	284
Par	t III	Taxation	
15	Is It	Possible to Increase Taxing and Conserve a Good Investment	
		ate in the Country?	287
	15.1	Influence of Tax on Profit Rates on the Efficiency	
		of the Investment Projects	287
	15.2	Investment Models	289
	15.3	Borrowings Abroad	292
	15.4	Dependence of NPV on Tax on Profit Rate at Different	
		Leverage Levels	293
	15.5	At a Constant Value of Equity Capital $(S = Const) \dots \dots$	294
	15.6	Without Flow Separation	296
		15.6.1 At a Constant Value of the Total Invested Capital	
		$(I = Const) \dots \dots$	296
		15.6.2 At a Constant Value of Equity Capital ($S = \text{Const}$)	298
	15.7	Conclusions	300
	Refer	rences	300
16	Ic It	Possible to Increase the Investment Efficiency by Increasing	
10		on Profit Rate? An Abnormal Influence of the Growth of Tax	
		rofit Rate on the Efficiency of the Investment	303
	16.1	Dependence of NPV on Leverage Level L at Fixed Levels	303
	10.1	of Tax on Profit Rate t	303
		16.1.1 The Effectiveness of the Investment Project	505
		from the Perspective of the Equity Holders Only	303
		16.1.2 The Effectiveness of the Investment Project	505
		from the Perspective of the Equity and Debt	
		Holders	314

xviii Contents

	16.2	Dependence of NPV on Tax on Profit Rate at Fixed Leverage	
		Levels L	321
		16.2.1 The Effectiveness of the Investment Project	
		from the Perspective of the Equity Holders Only	321
		16.2.2 The Effectiveness of the Investment Project	
		from the Perspective of the Equity and Debt	
		Holders	328
	Refer	ences	335
17	Optin	nizing the Investment Structure of the Telecommunication	
	Secto	r Company	337
	17.1	Introduction	337
	17.2	Investment Analysis and Recommendations for	
		Telecommunication Company "Nastcom Plus"	338
		17.2.1 The Dependence of NPV on Investment Capital	
		Structure	339
		17.2.2 The Dependence of NPV on the Equity Capital	
		Value and Coefficient β	348
	17.3	Effects of Taxation on the Optimal Capital Structure	
		of Companies in the Telecommunication Sector	354
	17.4	Conclusions	365
	Refer	ences	366
18	The (Golden Age of the Company (Three Colors	
		mpany's Time)	367
	18.1	Introduction	368
	18.2	Dependence of WACC on the Age of the Company <i>n</i>	
		at Different Leverage Levels	371
	18.3	Dependence of WACC on the Age of the Company <i>n</i>	
		at Different Values of Capital Costs (Equity, k_0 , and Debt, k_d)	
		and Fixed Leverage Levels	373
	18.4	Dependence of WACC on the Age of the Company <i>n</i>	
		at Different Values of Debt Capital Cost, k_d , and Fixed Equity	
		Cost, k_0 , and Fixed Leverage Levels	375
	18.5	Dependence of WACC on the Age of the Company <i>n</i>	
		at Different Values of Equity Cost, k_0 , and Fixed Debt	
		Capital Cost, k_d , and Fixed Leverage Levels	379
	18.6	Dependence of WACC on the Age of the Company <i>n</i> at High	
		Values of Capital Cost (Equity, k_0 , and Debt, k_d) and High	
		Lifetime of the Company	380
	18.7	Further Investigation of Effect	389
	18.8	Conclusions	391
	Refer	ences	393

Contents xix

19	A "G	olden Ag	ge" of the Companies: Conditions of Its Existence	395	
	19.1	Introduc	ction	396	
	19.2	Compar	nies Without the "Golden Age" (Large Difference		
		Between	n k_0 and k_d Costs)	397	
		19.2.1	Dependence of the Weighted Average Cost		
			of Capital, WACC, on the Company Age <i>n</i>		
			at Different Leverage Levels	397	
	19.3	Compar	nies with the "Golden Age" (Small Difference		
			n k_0 and k_d Costs)	399	
	19.4	Compar	nies with Abnormal "Golden Age" (Intermediate		
			nce Between k_0 and k_d Costs)	403	
	19.5		ring with Results from Previous Chapter	410	
		19.5.1	Under Change of the Debt Capital Cost, k_d	410	
		19.5.2	Under Change of the Equity Capital Cost, $k_0 \dots \dots$	411	
	19.6	Conclus	sions	411	
	Refer	ences		414	
20	The 1	Dala a£41	on Control Book and Communical Books		
20			ne Central Bank and Commercial Banks		
			nd Maintaining a Favorable Investment Climate	415	
			y		
	20.1		ction	415	
	20.2 Investment Models with Debt Repayment at the End of the Project				
			· ·	416	
		20.2.1	The Effectiveness of the Investment Project		
			from the Perspective of the Equity Holders Only	417	
	20.2	M- 4:-1:	(Without Flow Separation)	417	
	20.3	20.3.1	iani–Miller Limit (Long-Term (Perpetuity) Projects) The Dependence of the Efficiency of Investments	419	
		20.5.1	NPV on the Level of Debt Financing L for the Values		
				419	
		20.3.2	of Equity Costs $k_0 = 0.2$ The Dependence of the Efficiency of Investments	419	
		20.5.2	NPV on the Level of Debt Financing L for the Value		
				422	
	20.4	Drojecto	of Equity Costs $k_0 = 0.28$ of Finite (Arbitrary) Duration	424	
	20.4	20.4.1	The Dependence of the Efficiency of Investments	424	
		20.4.1	NPV on the Level of Debt Financing L for the Values		
			of Equity Costs $k_0 = 0.2$	424	
		20.4.2	The Dependence of the Efficiency of Investments	424	
		20.4.2	NPV on the Level of Debt Financing L for the Values		
			· · · · · · · · · · · · · · · · · · ·	120	
	20.5	The Dec	of Equity Costs $k_0 = 0.28$	428	
	20.5		pendence of the Net Present Value, NPV,	420	
	20.6		Leverage Level <i>l</i> for Projects of Different Durations	430 435	
	20.6		sions		
	Keter	ences		43/	

xx Contents

Par	t IV	Ratings a	and Rating Methodologies	
21	Ratin	g: New A	Approach	441
	21.1	Introdu	uction	441
	21.2	The Cl	oseness of the Rating Agencies	442
	21.3	The Us	se of Discounting in the Rating	442
	21.4		oration of Parameters, Used in Ratings,	
			rpetuity Limit of Modern Theory of Capital Structure	
			sov–Filatova–Orekhova	443
	21.5	•	5	443
		21.5.1	One-Period Model	444
		21.5.2	Multi-period Model	444
	21.6	Theory	of Incorporation of Parameters, Used in Ratings,	
			rpetuity Limit of Modern Theory of Capital Structure	
			sov–Filatova–Orekhova	445
		21.6.1	Coverage Ratios	445
		21.6.2	More Detailed Consideration	448
		21.6.3	Leverage Ratios	450
	21.7		Cost	453
	21.8		Evaluate the Discount Rate?	464
		21.8.1	Using One Ratio	465
		21.8.2	Using a Few Ratios	465
	21.9	Influen	ce of Leverage Level	465
		21.9.1	The Dependence of Equity Cost k_e on Leverage	
			Level at Two Coverage Ratio Values $i_i = 1$	
			and $i_1 = 2 \dots \dots \dots$	465
	21.10	The De	ependence of Equity Cost k_e on Leverage Level	
			Leverage Ratio Values $l_i = 1$ and $l_i = 2 \dots \dots$	468
	21.11		sion	472
	Refere	ences		473
22	Datin	~ Matha	delegan New Leek and New Herinana	475
22	22.1		dology: New Look and New Horizons	475
	22.1		alysis of Methodological and Systemic Deficiencies	4/3
	22.2		xisting Credit Rating of Nonfinancial Issuers	476
		22.2.1	The Closeness of the Rating Agencies	476
		22.2.1	Discounting	476
		22.2.2	Dividend Policy of the Company	477
		22.2.3	Leverage Level	477
		22.2.4	Taxation	478
		22.2.5	Account of the Industrial Specifics of the Issuer	479
		22.2.0	Neglect of Taking into Account the Particularities	4/9
		<i>LL.L.</i>		470
		22.2.0	of the Issuer	479
		22.2.8	Financial Ratios	479

Contents xxi

	22.3	Modific	ation of the BFO Theory for Companies	
		and Cor	porations of Arbitrary Age for Purposes of Ranking	481
	22.4	Coverag	ge Ratios	482
		22.4.1	Coverage Ratios of Debt	483
		22.4.2	The Coverage Ratio on Interest on the Credit	483
		22.4.3	Coverage Ratios of Debt and Interest on the Credit	
			(New Ratios)	485
		22.4.4	All Three Coverage Ratios Together	487
	22.5	Coverag	ge Ratios (Different Capital Cost Values)	490
		22.5.1	Coverage Ratios of Debt	490
		22.5.2	The Coverage Ratio on Interest on the Credit	492
		22.5.3	Coverage Ratios of Debt and Interest on the Credit	
			(New Ratios)	493
		22.5.4	Analysis and Conclusions	495
	22.6	Leverag	e Ratios	496
		22.6.1	Leverage Ratios for Debt	496
		22.6.2	Leverage Ratios for Interest on Credit	498
	22.7	Leverag	ge Ratios (Different Capital Costs)	499
		22.7.1	Leverage Ratios for Debt	499
		22.7.2	Leverage Ratios for Interests on Credit	500
		22.7.3	Leverage Ratios for Debt and Interests on Credit	500
		22.7.4	Analysis and Conclusions	500
	22.8	Conclus	sions	509
	Refer	ences		509
23	Ratin	gs of Lo	ng-Term Projects: A New Approach	511
	23.1	Investment Models		
		23.1.1	The Effectiveness of the Investment Project	
			from the Perspective of the Equity Holders Only	
			(Without Flows Separation)	512
		23.1.2	Modigliani–Miller Limit [Long-Term (Perpetuity)	
			Projects]	513
	23.2	Incorpor	ration of Financial Coefficients, Used in Project Rating,	
			dern Investment Models	514
		23.2.1	Coverage Ratios	514
		23.2.2	Leverage Ratios	516
	23.3	Depende	ence of NPV on Coverage Ratios	517
		23.3.1	Coverage Ratio on Debt	517
	23.4	Depende	ence of NPV on Leverage Ratios	522
		23.4.1	Leverage Ratio of Debt	522
	23.5	Conclus	sions	533
	Refer	ences		535

xxii Contents

24	New N	Meaningful Effects in Modern Capital Structure Theory	537
	24.1	Introduction	537
	24.2	Comparison of Modigliani–Miller (MM)	
		and Brusov–Filatova–Orekhova (BFO) Results	539
		24.2.1 The Traditional Approach	539
		24.2.2 Modigliani–Miller Theory	540
	24.3	Comparison of Modigliani–Miller Results (Perpetuity	
		Company) with Myers Results (1-Year Company)	
		and Brusov–Filatova–Orekhova Ones (Company	
		of Arbitrary Age)	542
	24.4	Bankruptcy of the Famous Trade-Off Theory	544
	24.5	The Qualitatively New Effect in Corporate Finance	546
		24.5.1 Perpetuity Modigliani–Miller Limit	548
		24.5.2 BFO Theory	549
	24.6	Conclusions	550
	24.7	Mechanism of Formation of the Company Optimal Capital	
		Structure	551
	24.8	"A Golden Age" of the Company	554
	24.9	Inflation in Modigliani–Miller and BFO Theories	557
	24.10	Effects, Connected with Tax Shields, Taxes, and Leverage	560
	24.11	Effects, Connected with the Influence of Tax on Profit Rate	
		on Effectiveness of Investment Projects	561
	24.12	Influence of Growth of Tax on Profit Rate	561
	24.13	New Approach to Ratings	564
		24.13.1 New Approach to Ratings: The Creditworthiness	
		of the Non-Finance Issuers	564
		24.13.2 New Approach to Long-Term Project Ratings	566
	Refere	nces	567
25	Conch	usion	569
45		nees	570