Microeconomics of Banking
Second Edition

Xavier Freixas and Jean-Charles Rochet

The MIT Press Cambridge, Massachusetts London, England

Contents

	List	XV	
	Prefa	ace	xvii
1	Intro	oduction	1
	1.1	What Is a Bank, and What Do Banks Do?	1
	1.2	Liquidity and Payment Services	2
		1.2.1 Money Changing •" • '	3
		1.2.2 Payment Services • ;	4
	1.3	Transforming Assets	4
	1.4	Managing Risks	5
		1.4.1 Credit Risk .	5
		1.4.2 Interest Rate and Liquidity Risks	5
		1.4.3 Off-Balance-Sheet Operations	6
	1.5	Monitoring and Information Processing	6
	1.6	The Role of Banks in the Resource Allocation Process	7
	1.7	Banking in the Ariow-Debreu Model	7
		1.7.1 The Consumer	8
		1.7.2 The Firm	9
		1.7.3 The Bank •••'.•	9
		1.7.4 General Equilibrium •>.•.•·.•	9
	1.8	Outline of the Book • ' • '	10
2	The	Role of Financial Intermediaries	15
	2.1	Transaction Costs	18
		2.1.1 Economies of Scope	18
		2.1.2 Economies of Scale . < • ' • ' • •	19
	2.2	Coalitions of Depositors and Liquidity Insurance	20
		2.2.1 The Model	20

viii Contents

		2.2.2	Characteristics of the Optimal Allocation •	21
		2.2.3	Autarky	21
		2.2.4	Market Economy	22
		2.2.5	Financial Intermediation	23
	2.3	Coali	tions of Borrowers and the Cost of Capital	24
		2.3.1	A Simple Model of Capital Markets with Adverse	
			Selection	25
		2.3.2	Signaling through Self-Financing andthe Cost of Capital	2ϵ
		2.3.3	Coalitions of Borrowers	28
		2.3.4	Suggestions for Further Reading	28
	2.4	Finan	cial Intermediation.as Delegated Monitoring	30
	2.5	The C	Choice between Market Debt and Bank Debt	34
		2.5.1	A Simple Model of the Credit Market with Moral	
			Hazard	34
		2.5.2	Monitoring and Reputation •	36
		2.5.3	Monitoring and Capital	39
		2.5.4	Financial Architecture	42
		2.5.5	Credit Risk and Dilution Costs -	43
	2.6	Liquio	dity Provision to Firms	46
	2.7	Sugge	estions for Further Reading .	47
	2.8	Proble	ems .	49
		2.8.1	Strategic Entrepreneurs and Market Financing	49
		2.8.2	Market versus Bank Finance	' 50
		2.8.3	Economies of Scale in Information Production	50
		2.8.4	Monitoring as a Public Good and Gresham's Law	51
		2.8.5	Intermediation and Search Costs .	52
		2.8.6	Intertemporal Insurance •	53
	2.9	Soluti	ions	54
		2.9.1	Strategic Entrepreneurs and Market Financing	54
		2.9.2	Market versus Bank Finance	55
		2.9.3	Economies of Scale in Information Production	5
		2.9.4	Monitoring as a Public Good and Gresham's Law	58
		2.9.5	Intermediation and Search Costs	60
		2.9.6	Intertemporal Insurance	62
3	The	Industr	rial Organization Approach to Banking	69
	3.1		odel of a Perfect Competitive Banking Sector	70
		3.1.1	The Model	70

Contents

	3.1.2	The Credit Multiplier Approach	71
	3.1.3	The Behavior of Individual Banks in a Competitive	
		Banking Sector	72
	3.1.4	The Competitive Equilibrium of the Banking Sector	75
3.2	The N	Monti-Klein Model of a Monopolistic Bank	78
	3.2.1	The Original Model	78
	3.2.2	The Oligopolistic Version	79
	3.2.3	Empirical Evidence	80
3.3	Mono	polistic Competition	81
	3.3.1	Does Free Competition Lead to the Optimal Number of	
		Banks?	81
	3.3.2	The Impact of Deposit Rate Regulation on Credit Rates	84
	3.3.3	1	87
	3.3.4	r	88
3.4		cope of the Banking Firm .	88
3.5	Beyor	nd Price Competition	89
	3.5.1	Risk Taking on Investments	89
	3.5.2	Monitoring and Incentives in a Financial Conglomerate	93
	3.5.3	Competition and Screening	95
3.6	Relati	ionship Banking '	99
	3.6.1	The Ex Post Monopoly of Information	99
	3.6.2	Equilibrium with Screening and Relationship Banking	102
	3.6.3	Does Competition Threaten Relationship Banking?	103
	3.6.4	1	104
	3.6.5	Empirical Tests of Relationship .Banking	104
3.7	Paym	ent Cards and Two-Sided Markets	107
	3.7.1	A Model of the Payment Card Industry	108
	3.7.2		109
	3.7.3	1 2	110
	3.7.4	Competing Payment Card Networks	111
	3.7.5	Welfare Analysis .	I11
3.8	Probl	ems .	112
	3.8.1	Extension of the Monti-Klein Model to the Case of	
		Risky Loans	112
	3.8.2	Compatibility between Banking Networks	113
	3.8.3	Double Bertrand Competition	113
	3.8.4	Deposit Rate Regulation	114

3.9	Solution	ons • .	115
	3.9.1	Extension of the Monti-Klein Model to the Case of	
		Risky Loans .	115
	3.9.2	Compatibility between Banking Networks	116
	3.9.3	Double Bertrand Competition	117
	3.9.4 (Deposit Rate Regulation	118
The	Lender	-Borrower Relationship	127
4.1	Why l	Risk Sharing Does Not Explain All the Features of Bank	
	Loans		128
4.2	Costly	State Verification	130
	4.2.1	Incentive-Compatible Contracts	131
	4.2:2	Efficient Incentive-Compatible Contracts	132
	4.2.3	Efficient Falsification-Proof Contracts	133
4.3	Incent	ives to Repay	134
	4.3.1	Nonpecuniary Cqst of Bankruptcy	134
	4.3.2	Threat of Termination	135
	4.3.3	Impact of Judicial Enforcement	137
	4.3.4	Strategic Debt Repayment: The Case of a Sovereign	
		Debtor • •	139
4.4	Moral	Hazard '	143
4.5	The In	ncomplete Contract Approach	146
	4.5.1	Private Debtors and the Inalienability of Human Capital	147
	4.5.2	Liquidity of Assets and Debt Capacity	149
	4.5.3	Soft Budget Constraints and Financial Structure	150
4.6	Colla	teral as a Device for Screening Heterogeneous Borrowers	153
4.7	Proble	ems - •'•	157
	4.7.1	Optimal Risk Sharing with Symmetric Information	157
	4.7.2	Optimal Debt Contracts with Moral Hazard	158
	4.7.3	The Optimality of Stochastic Auditing Schemes	159
	4.7.4	The Role of Hard Claims in Constraining Management	160
	4.7.5	Collateral and Rationing	160
	4.7.6	Securitization	161
4.8	Soluti	ions • '	161
	4.8.1	Optimal Risk Sharing with Symmetric Information	161
	4.8.2	Optimal Debt Contracts with Moral Hazard '	162
	4.8.3	The Optimality of Stochastic Auditing Schemes	163
	4.8.4	The Role of Hard Claims in Constraining Management	164

Contents

	4.8.5	Collateral and Rationing •	164
	4.8.6	Securitization	165
Equi	ilibrium	in the Credit Market and Its Macroeconomic Implications	171
5.1		tion of Equilibrium Credit Rationing	172
5.2	The B	ackward-Bending Supply of Credit	173
5.3	Equili	brium Credit Rationing	175
	5.3.1	Adverse Selection	175
	5.3.2	Costly State Verification	177
	5.3.3	Moral Hazard	178
5.4	Equili	brium with a Broader Class of Contracts	181
5.5	Proble	ems	185
	5.5.1	The Model of Mankiw	185
	5.5.2	Efficient Credit Rationing	185
	5.5.3	Too Much In vestment'	186
5.6	Soluti	ons	186
	5.6.1	The Model of Mankiw	186
	5.6.2	Efficient Credit Rationing	187
	5.6.3	Too Much Investment	188
The	Macro	economic Consequences of Financial Imperfections	193
6.1	A Sho	ort Historical Perspective	195
6.2	The T	ransmission Channels of Monetary Policy	196
	6.2.1	The Different Channels	197
	6.2.2	A Simple Model	198
	6.2.3	Credit View versus Money View: Justification of the	
		Assumptions and Empirical Evidence	200
	6.2.4	Empirical Evidence on the Credit View	202
6.3		cial Fragility and Economic Performance	203
6.4	Finan	cial Development and Economic Growth .	209
Indi	ividual 1	Bank Runs and Systemic Risk	217
7.1	Bank	ing Deposits and Liquidity Insurance	218
	7.1.1	A Model of Liquidity Insurance	218
	7.1.2	Autarky .	219
	7.1.3	The Allocation Obtained When a Financial Market Is	
		Opened	219
	7.1.4	The Optimal (Symmetric) Allocation	220
	7.1.5	A Fractional Reserve Banking System	220

xii Contents

7.2	The Stability of the Fractional Reserve System and Alternative			
	Institu	ational Arrangements	222	
	7.2.1	The Causes of Instability	222	
	7.2.2	A First Remedy for Instability: Narrow Banking	222	
	7.2.3	Regulatory Responses: Suspension of Convertibility or		
		Deposit Insurance	224	
	7.2.4	Jacklin's Proposal: Equity versus Deposits	225	
7.3	Bank	Runs and Renegotiation	227	
	7.3.1	A Simple Model ^	227	
	7.3.2	Pledgeable and Nonpledgeable Cash Flows	228	
	7.3.3	Bank Runs as a Discipline Device	' 228	
	7.3.4	The Role of Capital	229	
7.4	Efficie	ent Bank Runs! '	230	
7.5	Interl	bank Markets and the Management of Idiosyncratic		
	Liquid	dity Shocks	233	
	7.5.1-	The Model of Bhattacharya and Gale	233	
	7.5.2	The Role of the Interbank Market	234	
	7.5.3	The Case of Unobservable Liquidity Shocks	234	
7.6	System	mic Risk and Contagion	235	
	7.6.1	Aggregate Liquidity and Banking Crises	' 236	
	7.6.2	Payment Systems and OTC Operations	238	
	7.6.3	Contagion through Interbank Claims •	239	
7.7	Lende	er of Last Resort: A Historical Perspective	242	
	7.7.1	Views on the LLR Role	243	
	7.7.2	Liquidity and Solvency: A Coordination Game	244	
	7.7.3	The Practice of LLR Assistance	246	
	7.7.4	The Effect of LLR and Other Partial Arrangements '	247	
7.8	Probl	ems	248	
	7.8.1	Bank Runs and Moral Hazard	248	
	7.8.2	Bank Runs	249	
	7.8.3	Information-Based Bank Runs	249	
	7.8.4	Banks'Suspension of Convertibility	250	
	7.8.5	Aggregated Liquidity Shocks	251	
	7.8.6	Charter Value	252	
7.9	Solut	ions	253	
	7.9.1	Banks Runs and Moral Hazard	253	
	7.9.2	Bank Runs	253	

Contents xiii

		7.9.3	Information-Based Bank Runs	255
		7.9.4	Banks' Suspension of Convertibility	255
		7.9.5	Aggregated Liquidity Shocks	257
		7.9.6	Charter Value	258
8	Mar	aging I	Risks in the Banking Firm	265
	8.1	Credit	t Risk	266
		8.1.1	Institutional Context	266
		8.1.2	Evaluating the Cost of Credit Risk	267
		8.1.3	Regulatory Response to Credit Risk	271
	8.2	Liquio	dity Risk '	273
		8.2.1	Reserve Management	274
		8.2.2	Introducing Liquidity Risk into the Monti-Klein Model	275
		8.2.3	The Bank as a Market Maker	277
	8.3	Intere	st Rate Risk	280
		8.3.1	The Term Structure of Interest Rates	281
		8.3.2	Measuring Interest Rate Risk Exposure	283
		8.3.3	Applications to Asset Liability Management	284
	8.4	Mark	et Risk	286
		8.4.1	Portfolio Theory: The Capital Asset Pricing Model	286
		8.4.2	The Bank as a Portfolio Manager: The Pyle-Hart-Jaffee	
			Approach	288
		8.4.3	An Application of the Portfolio Model: The Impact of	
			Capital Requirements	291
	8.5	Proble	ems	296
		8.5.1	The Model of Prisman, Slovin, and Sushka	296
		8.5.2	The Risk Structure of Interest Rates	297
		8.5.3	Using the CAPM for Loan Pricing	298
	8.6	Soluti	ions	298
		8.6.1	The Model of Prisman, Slovin, and Sushka	298
		8.6.2	The Risk Structure of Interest Rates	300
		8.6.3	Using the CAPM for Loan Pricing	301
9	The	Regula	ation of Banks	305
	9.1	The J	Justification for Banking Regulation	306
		9.1.1	The General Setting	306
		9.1.2	The Fragility of Banks	307
		9.1.3	The Protection of Depositors'and Customers'Confidence	308
		914	The Cost of Bank Failures	310

xiv Contents

9.2	A Fra	mework for Regulatory Analysis	310
9.3	Depos	it Insurance • , •	313
	9.3.1	The Moral Hazard Issue	313
	9.3.2	Risk-Related Insurance Premiums	315
	9.3.3	Is Fairly Priced Deposit Insurance Possible?	316
	9.3.4	The Effects of Deposit Insurance on the Banking	
		Industry	318
9.4	Solver	ncy Regulations _ • .	319
	9.4.1	The Portfolio Approach '	319
	9.4.2	Cost of Bank Capital and Deposit Rate Regulation .	320
	9.4.3	The Incentive Approach ,	323
	9.4.4	The Incomplete Contract Approach	324
	9A5	The Three Pillars of Basel II	328
9.5	The F	Resolution of Bank Failures	329
	9.5.1	Resolving Banks' Distress: Instruments and Policies .	329
	9.5.2	Information Revelation and Managers' Incentives ,	330
	9.5.3	Who Should Decide on Banks' Closure?	332
9.6	Mark	et Discipline	335
	9.6.1	Theoretical Framework	336
	9.6.2	Empirical Evidence .	337
9.7	Sugge	estions for Further Reading	338
9.8	Probl	em	340
	9.8.1	Moral Hazard and Capital Regulation "	340
9.9	Soluti	ion '	340
	9.9.1	Moral Hazard and Capital Regulation .	340
Inde	ex	,	349