	Lis	t of Fig	gures	xv	
	Pre	face		xvii	
1	Int	Introduction			
	1.1	Wha	t Is a Bank, and What Do Banks Do?	1 1	
	1.2		idity and Payment Services	2	
		1.2.1		3	
		1.2.2	Payment Services	4	
	1.3	Tran	sforming Assets	4	
	1.4	Man	aging 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	Moni	itoring and Information Processing	6	
	1.6	The I	Role of Banks in the Resource Allocation Process	7	
	1.7	Bank	ing in the Arrow-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	Outlin	ne of the Book	10	
2	The	Role o	f Financial Intermediaries	15	
	2.1	Trans	action Costs	18	
		2.1.1	Economies of Scope	18	
		2.1.2	Economies of Scale	19	
	2.2	Coalit	tions 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	Coal	itions of Borrowers and the Cost of Capital	24
		2.3.1	A Simple Model of Capital Markets with Adverse	
			Selection	25
			Signaling through Self-Financing and the Cost of Capital	26
			Coalitions of Borrowers	28
			Suggestions for Further Reading	28
	2.4		ncial Intermediation as Delegated Monitoring	30
	2.5	The (Choice between Market Debt and Bank Debt	34
		2.5.1	-F Credit Market with Moral	
			Hazard	34
		2.5.2	Monitoring and Reputation	36
			Monitoring and Capital	39
			Financial Architecture	42
			Credit Risk and Dilution Costs	43
			dity Provision to Firms	46
	2.7		estions for Further Reading	47
	2.8	Probl	ems	49
		2.8.1	and Market I maneing	49
		2.8.2	The state of the s	50
			Economies of Scale in Information Production	50
		2.8.4	But a a wond Good and Gresham & Law	51
		2.8.5	and Staten Costs	52
		2.8.6	Intertemporal Insurance	53
	2.9	Soluti	ons	54
		2.9.1	Strategic Entrepreneurs and Market Financing	54
		2.9.2	Market versus Bank Finance	55
		2.9.3	in amorniation i foduction	57
		2.9.4	as a ruene Good and Gresnam's Law	58
		2.9.5	Intermediation and Search Costs	60
		2.9.6	Intertemporal Insurance	62
3	The	Industr	ial Organization Approach to Banking	69
	3.1	A Mo	del of a Perfect Competitive Banking Sector	70
		3.1.1	The Model	70 70
				70

Contents ix

	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	removed and the bunking beetof	75
3.2	The l	Monti-Klein Model of a Monopolistic Bank	78
	3.2.1	The Original Model	78
	3.2.2	<i>D</i> 1	79
	3.2.3	•	80
3.3		opolistic 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
		Bank Network Compatibility	87
	3.3.4	Empirical Evidence	88
3.4	The S	Scope of the Banking Firm	88
3.5	Beyon	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	Intertemporal Insurance	104
	3.6.5	Empirical Tests of Relationship Banking	104
3.7	•	ent Cards and Two-Sided Markets	107
	3.7.1	A Model of the Payment Card Industry	108
	3.7.2	Card Use	109
	3.7.3	Monopoly Network	110
	3.7.4	Competing Payment Card Networks	111
	3.7.5	Welfare Analysis	111
3.8	Proble	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

x

	3.9	Solut	tions	115
		3.9.1	Extension of the Monti-Klein Model to the Case of	
			Risky Loans	115
		3.9.2	1	116
		3.9.3	Double Bertrand Competition	117
		3.9.4	Deposit Rate Regulation	118
4	The	Lende	r-Borrower Relationship	127
	4.1	Why	Risk Sharing Does Not Explain All the Features of Bank	
		Loan	s	128
	4.2	Costl	y 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	Incen	tives to Repay	134
		4.3.1	Nonpecuniary Cost 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	Mora	l Hazard	143
	4.5	The I	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		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		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

		4.8.5	Collateral and Rationing	164
		4.8.6		165
5	Eq	uilibriu	m in the Credit Market and Its Macroeconomic Implications	171
	5.1		nition of Equilibrium Credit Rationing	171
	5.2		Backward-Bending Supply of Credit	173
	5.3		librium Credit Rationing	175
			Adverse Selection	175
		5.3.2	Costly State Verification	177
		5.3.3	Moral Hazard	178
	5.4	Equil	ibrium with a Broader Class of Contracts	181
	5.5	Probl	ems	185
		5.5.1	The Model of Mankiw	185
		5.5.2	Efficient Credit Rationing	185
		5.5.3	Too Much Investment	186
	5.6	Soluti	ions	186
		5.6.1	The first of tradition	186
		5.6.2	Efficient Credit Rationing	187
		5.6.3	Too Much Investment	188
6	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
7	Indi	vidual E	Bank Runs and Systemic Risk	217
	7.1	Banki	ng Deposits and Liquidity Insurance	218
		7.1.1	A Model of Liquidity Insurance	218
		7.1.2	Autarky	219
		7.1.3		
			Opened	219
			The Optimal (Symmetric) Allocation	220
		7.1.5	A Fractional Reserve Banking System	220

xii Contents

7.2	The S	Stability of the Fractional Reserve System and Alternative	
	Instit	utional 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
		The Role of Capital	229
7.4	Efficie	ent Bank Runs	230
7.5	Interb	pank Markets and the Management of Idiosyncratic	
		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	nic 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
		The Practice of LLR Assistance	246
	7.7.4	The Effect of LLR and Other Partial Arrangements	247
7.8	Proble		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	Soluti	ons	253
	7.9.1	Banks Runs and Moral Hazard	253
	7.9.2	Bank Runs	253

		7.9.3	Information-Based Bank Runs	255
		7.9.4	and the property of convertionity	255
		7.9.5	Aggregated Liquidity Shocks	257
		7.9.6	Charter Value	258
8	Ma	inaging	Risks in the Banking Firm	265
	8.1	Cred	it 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	Liqui	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	est 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		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	Solution		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	tion of Banks	305
	9.1	The Ju	stification 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
		9.1.4	The Cost of Bank Failures	310

xiv Contents

9.2	A Fra	amework for Regulatory Analysis	310
9.3	Depo	sit 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	Solve	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
	9.4.5	The Three Pillars of Basel II	328
9.5	The R	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	stions for Further Reading	338
9.8	Proble		340
	9.8.1	Moral Hazard and Capital Regulation	340
9.9	Soluti	- - -	340
	9.9.1	Moral Hazard and Capital Regulation	340
Inde	×		349

Figures

1.1	Financial decisions of economic agents.	8
2.1	Bank balance sheet in Bryant-Diamond-Dybvig paradigm.	24
2.2	Direct finance: Each lender monitors its borrower (total cost nmK).	31
2.3	Intermediated finance: Delegated monitoring (total cost $nK + C_n$).	32
2.4	Firms categorized by type of finance.	42
2.5	Optimal financing choices of firms.	46
3.1	Increments in aggregated balances of various agents.	72
3.2	Locations on Salop circle.	83
3.3	Costs and benefits of a card transaction.	108
4.1	Optimality of the standard debt contract under costly state verification.	133
4.2	Optimality of the standard debt contract under nonpecuniary costs of	
	bankruptcy.	135
4.3	Underinvestment in the case of a strategic debtor (Allen 1983).	140
4.4	Optimal contract in Innes (1987) moral hazard model.	145
4.5	Borrowers' indifference curves: low risks Δ^L , high risks Δ^H .	154
4.6	Optimal menu of loan contracts.	156
4.7	Pareto frontiers with deterministic and stochastic audits.	164
5.1	Expected return to the bank as a function of nominal rate of loan.	173
5.2	Equilibrium credit rationing.	174
5.3	Profit to the firm as a function of cash flow from project.	176
5.4	Expected return to the bank as a function of R in Bester-Hellwig (1987)	
	model: Case 1.	179
5.5	Expected return to the bank as a function of R in Bester-Hellwig (1987)	
<i>.</i> .	model: Case 2.	180
5.6	Separating equilibrium in Bester (1985) model: The only candidate is	100
	$(\gamma_L^*, \gamma_H^*).$	182

xvi		Figures
5.7a 5.7b	Separating equilibrium in Bester (1985) model: Equilibrium exists. Separating equilibrium in Bester (1985) model: Equilibrium does not	184
	exist.	184
6.1	Timing in Bernanke-Gertler (1990) model.	205
7.1	Different sets of contracts.	226
7.2	Debt deflation.	236
7.3	Two examples of interbank borrowing architecture.	241
9.1	Banking regulation in perspective.	311
9.2	Best and second-best decision rules (Dewatripont and Tirole 1994, 8.66)	
9.3	Closure policies.	328

xvi