Leverage Cycles and the Anxious Economy

By A. Fostel and J.Geanakoplos

Built upon a series of papers of themselves and published in *American Economic Review*

Summary

We provide a pricing theory for emerging asset classes, like emerging markets, that are not yet mature enough to be attractive to the general public. We show how leverage cycles can cause contagion, flight to collateral, and issuance rationing in a frequently recurring phase we call the anxious economy. Our model provides an explanation for the volatile access of emerging economies to international financial markets, and for three stylized facts we identify in emerging markets and high yield data since the late 1990s. Our analytical framework is a general equilibrium model with heterogeneous agents, incomplete markets, and endogenous collateral, plus an extension encompassing adverse selection. (*JEL* D53, G12, G14, G15)

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Especially, it is shown that

leverage is *not* necessary to generate contagion

between emerging assets & more dominant assets.

(such as US high yield bonds.)

I. Relation with the Literature

Relation with the Literature: Model

(1) Endogenous credit constraints in GE

(2) Exogenous credit constraints in GE

(3) Asymmetric info. in GE

(4) Combination of (1) & (3)

Relation with the Literature: Model

(1) Endogenous credit constraints in GE

Geanakoplos(97, 03), G-Zame(98)

(2) Exogenous credit constraints in GE

Kiyotaki-Moore(97), Bernanke-Gertler-Gilchrist(96), Caballero-Krishnamurthy(01)

(3) Asymmetric info. in GE

Gale(92), Bisin-Gottardi(06), Rustichini-Siconolfi(Forthcoming)

(4) Combination of (1) & (3)

Rothchild-Stiglitz(76), Dubey-Geanakoplos(02)

II. Stylized Facts

The “Anxious Economy”

:= A period of 3 consecutive weeks or more
during which the weekly primary issuance over all emerging markets
are less than 40% of the period’s trend

TABLE 1—PRIMARY MARKET CLOSURES FOR EMERGING MARKET BONDS, 1997–2002

Closure	Year	Date	Duration (weeks)	Associated event
1	1997	03/17–04/06	3	Thailand turmoil
2	1997	08/18–09/07	3	Thailand devaluation
3	1997	10/27–12/07	6	Korea crisis
4	1998	08/03–10/26	12	Russia default and LTCM
5	1999	01/01–01/31	4	Brazil devaluation
6	1999	07/12–08/02	3	
7	1999	08/16–09/05	3	
8	2000	04/03–05/01	4	US interest rate anxieties
9	2000	09/25–10/30	5	US stock market crash
10	2001	08/20–09/10	3	US recession concerns
11	2002	04/29–06/17	7	Brazil turmoil
12	2002	08/05–09/02	4	US stock market
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20.29% of the time primary markets were closed.

(“The anxious economy”)

Emerging Markets & US High Yield Spreads Correlation

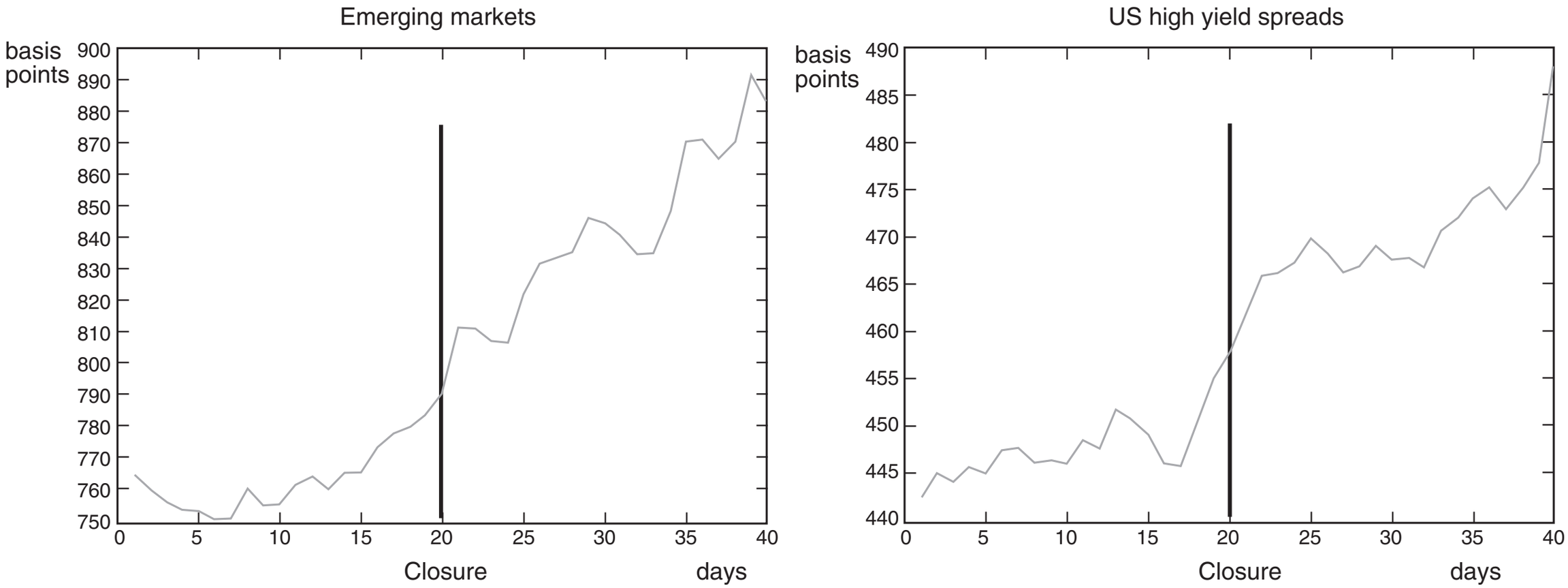


FIGURE 1. AVERAGE SPREADS AROUND CLOSURES

Emerging Markets & US High Yield Spreads Correlation

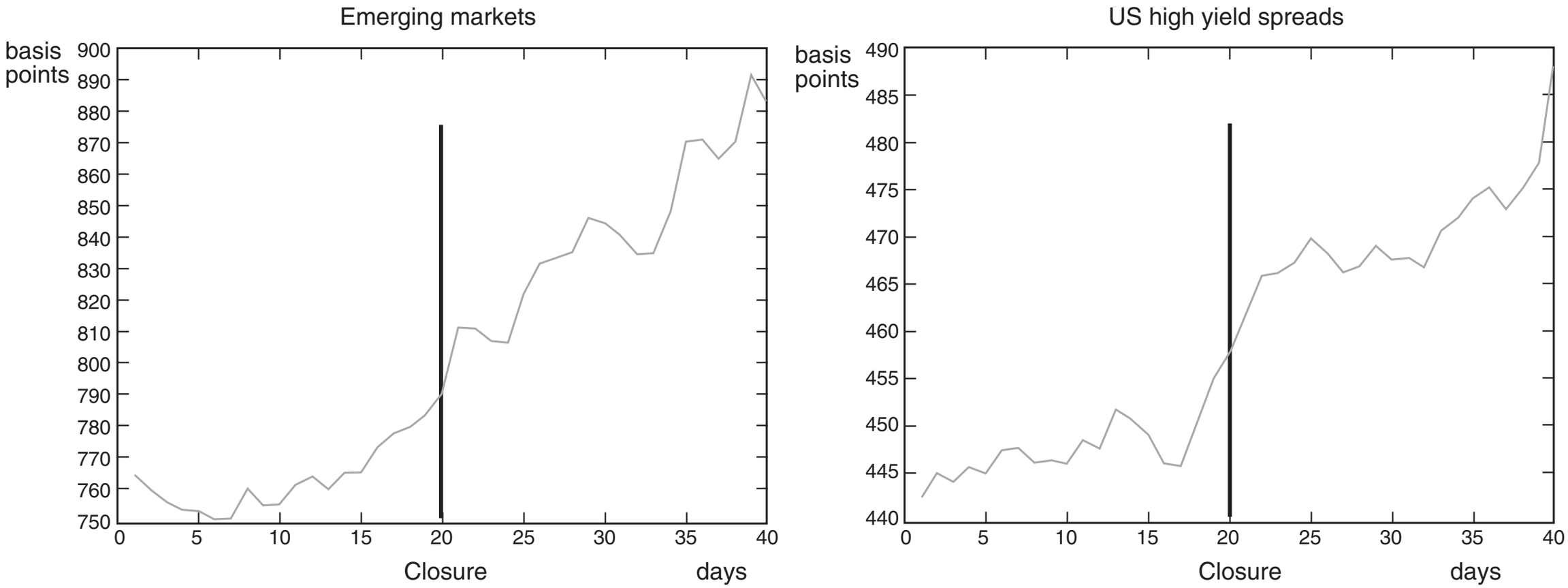


FIGURE 1. AVERAGE SPREADS AROUND CLOSURES

The average correlation during the above period is 0.33.

Nonuniform Changes in Emerging Markets Spreads Across the Credit Spectrum

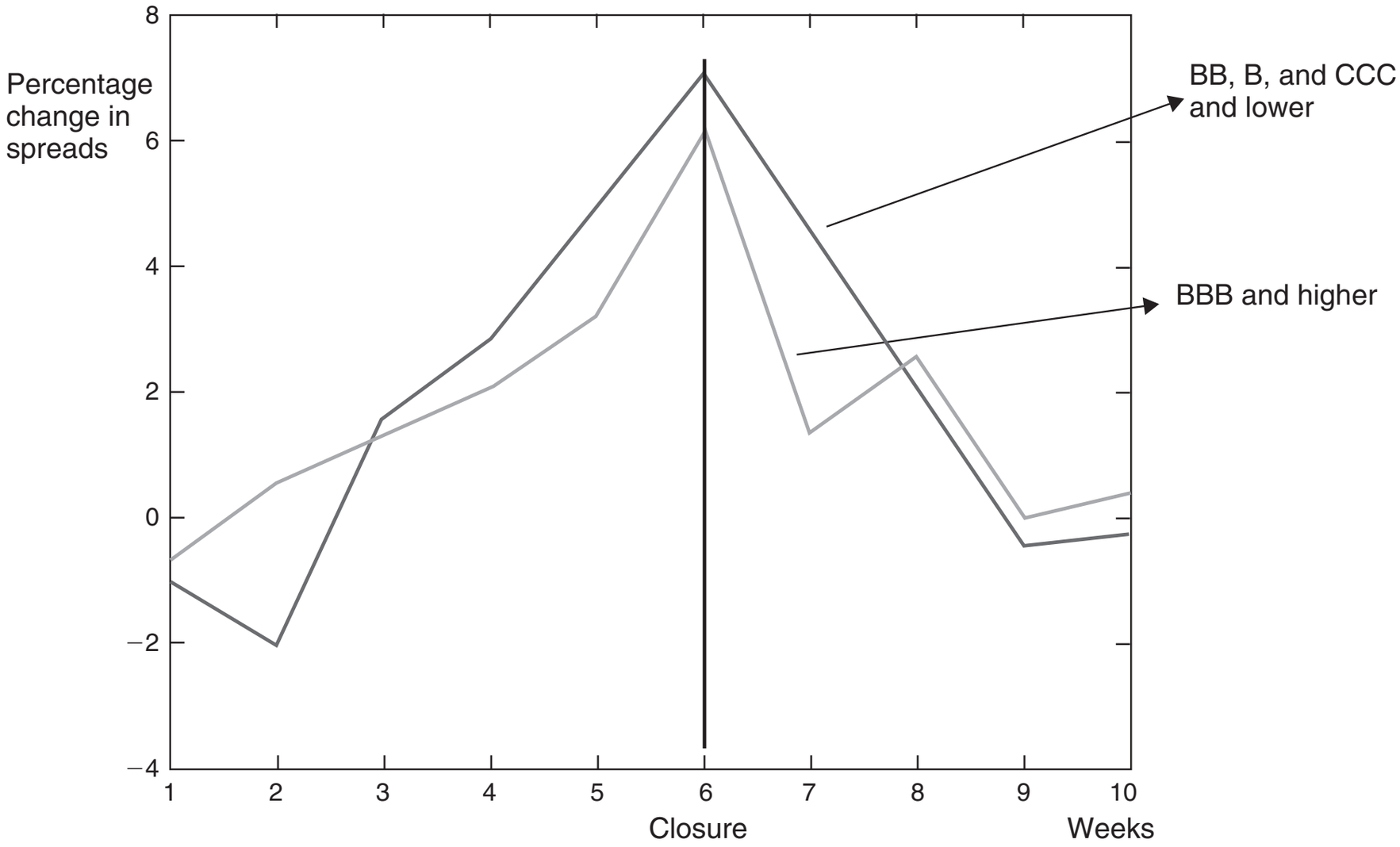
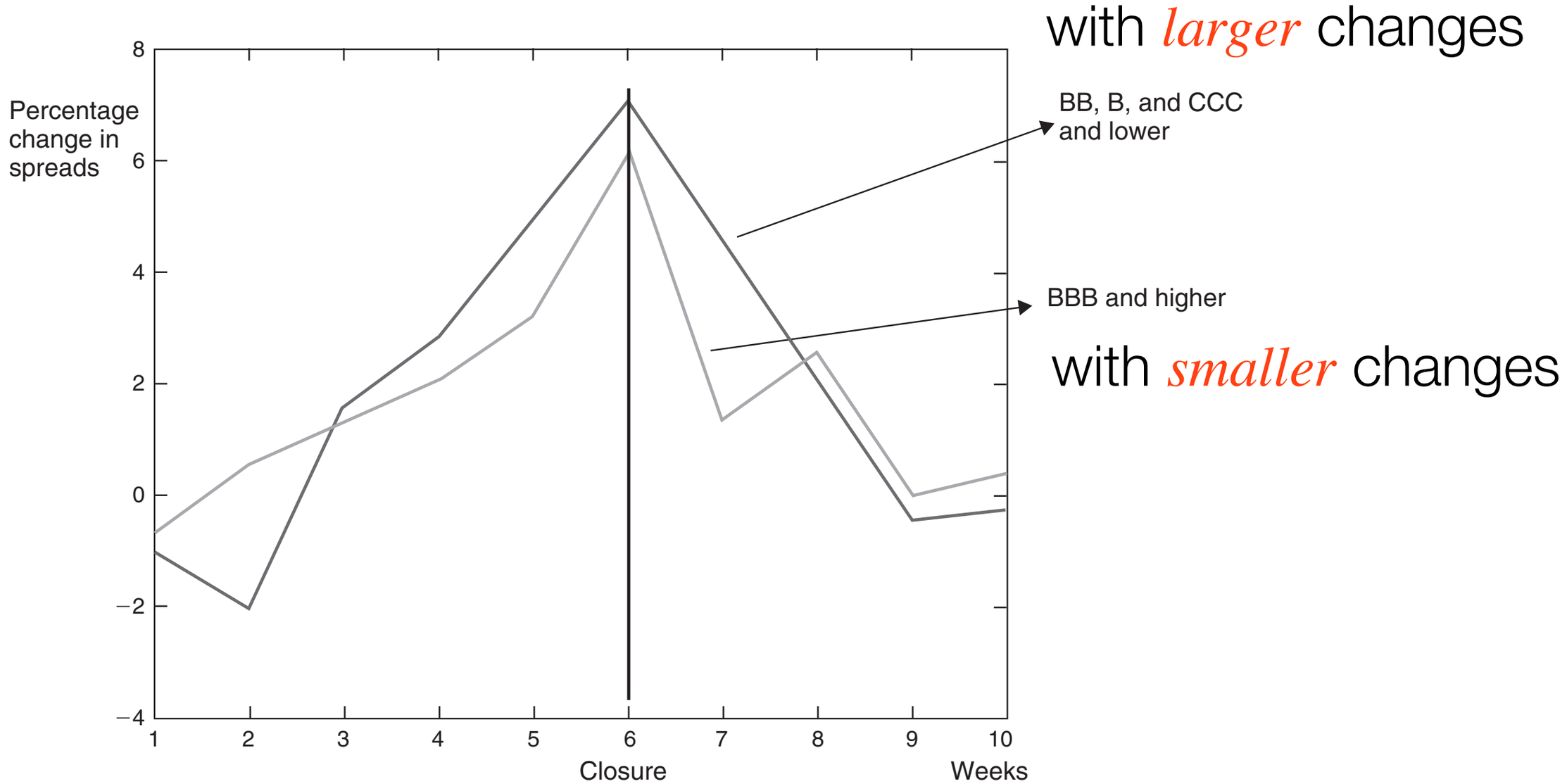


FIGURE 3. AVERAGE PERCENTAGE CHANGE IN EMERGING MARKET SPREADS BY CREDIT RATINGS AROUND CLOSURES

Nonuniform Changes in Emerging Markets Spreads Across the Credit Spectrum



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Nonuniform Changes in Issuance Across the Credit Spectrum

High-rated emerging market issuance *drops more* than the low-rated. (This paper's new finding.)

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Puzzling contrast

High-rated emerging market spreads *increases less* than the low-rated. (Gonzales-Yeyati(05))

Toy Model

(III. The Problem
A. The Anxious Economy)

Toy Model of the Anxious Economy

- A single consumption good
- Agents are endowed with
  e of the good at each node

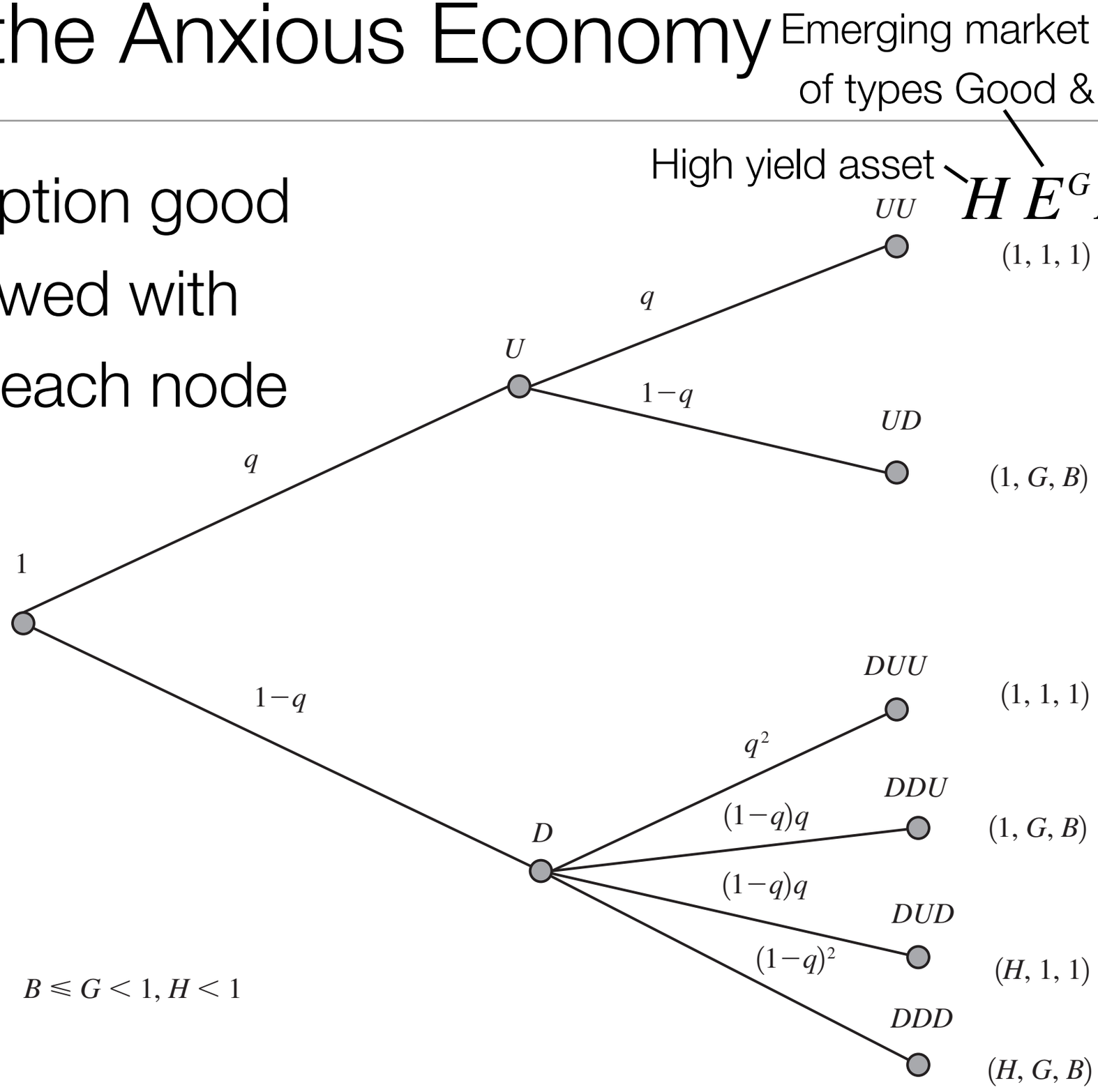

FIGURE 4

Toy Model of the Anxious Economy

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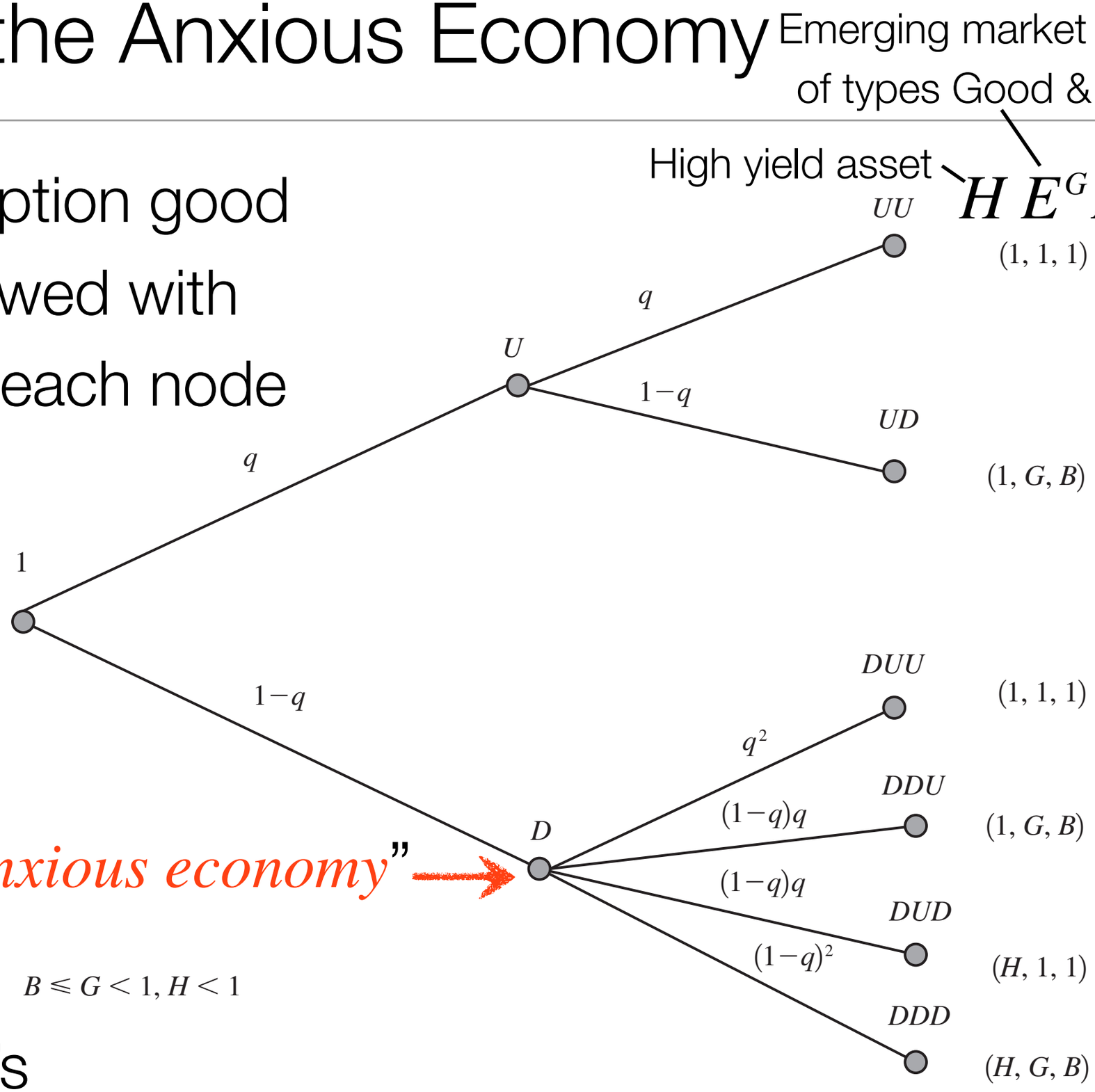

At this "*anxious economy*" →

- Volatility of H ↑ $\quad B \leqslant G < 1, H < 1$
- No info. about E's

FIGURE 4

Simulations

(III. The Problem (Subsections B-D),
IV. Model I: Collateral GE (Subsections C-E), &
V. Model II: Collateral GE w/ Adverse Selection
(Subsection B))

A. Representative Agent (without Collateral)

B. Heterogenous Agents & Complete Markets (w/o Collateral)

No Contagion

TABLE 2—SIMULATIONS 1 AND 2

Asset	p_1	p_U	p_D	$(p_U - p_D)/p_U$ %	$(p_1 - p_D)/p_1$ %
Panel A. Representative agent					
E	0.9082	0.9082	0.9083	−0.01	−0.01
H	0.9901	0.9981	0.9183	8.00	7.25

Why $p_U < p_D$ for E?

At D, future consumption is lower than at U.

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At D, future consumption is lower than at U.

→The MU for future output such as E is higher.

B. Heterogenous Agents & Complete Markets (w/o Collateral)

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In this case, there are "*optimists*" and "*pessimists*,"

who are and will be differrent in beliefs and wealth.

Almost No Contagion

TABLE 2—SIMULATIONS 1 AND 2

Asset	p_1	p_U	p_D	$(p_U - p_D)/p_U$ %	$(p_1 - p_D)/p_1$ %
Panel B. Complete markets and heterogeneous agents					
E	0.5527	0.5554	0.5499	1.0	0.5
H	0.8007	0.9985	0.5998	39.9	25.1

Why $p_U > p_D$ for E?

With complete markets, agents are able to transfer wealth to the states they think are more likely.

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Why $p_U > p_D$ for E?

With complete markets, agents are able to transfer wealth to the states they think are more likely.

→At U, prices reflect the optimists' preferences more than at D.

C. Heterogenous Agents & *In*complete Markets (w/o Collateral)

Contagion

TABLE 3—SIMULATION 3, INCOMPLETE MARKETS: PRICES

	1	U	D	$(U-D)/U$ %	$(1-D)/1$ %
ω	0.0668	0.0447	0.2429		
Asset					
E	0.7954	0.8630	0.7273	15.72	8.56
H	0.9097	0.9986	0.7364	26.25	19.05

Why $p_U > p_D$ for E?

At U, both types agree about H and optimists end up holding *none* of it.

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The increase in the demand for E

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Why $p_U > p_D$ for E?

At D, the difference in opinion increases and optimists end up holding *all* of H.

↓

The reduction in the demand for E

Contagion

TABLE 3—SIMULATION 3, INCOMPLETE MARKETS: PRICES

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Leverage is *not* necessary to generate contagion.

The above portfolio effect is enough.

※The share of crossover investors in emerging markets:

15% (1996)→40% (2002)

※Leveraged investors: 30% (1998)→5% (2002)

No “Differential Contagion”

TABLE 6—SIMULATION 4, INCOMPLETE MARKETS WITH 3 ASSETS: PRICES

	1	U	D	$(U-D)/U$ %	$(1-D)/1$ %
ω	0.0594	0.09	0.2309		
Asset					
G	0.7817	0.8378	0.7431	11.3	4.9
B	0.7679	0.8230	0.7301	11.3	4.9
H	0.8477	0.9162	0.7485	18.9	12.3

C. Heterogenous Agents & Incomplete Markets (*with* Collateral)

In this case, E (but not H) can be used as collateral to borrow money.

Bigger Contagion

TABLE 9—SIMULATION 5, INCOMPLETE MARKETS WITH COLLATERAL: PRICES AND INTEREST RATE

Asset	1	U	D	$(U - D)/U$ %	$(1 - D)/1$ %
E	0.8511	0.8695	0.7416	14.7	12.9
H	0.9316	0.9985	0.7306	26.8	21.6
r	0.0000	−0.0015	0.0005		

"Bigger" contagion because

- The room for leverage amplifies the portfolio effect.
- A new channel through which liquidity affects prices:

The collateral value.

Robustness

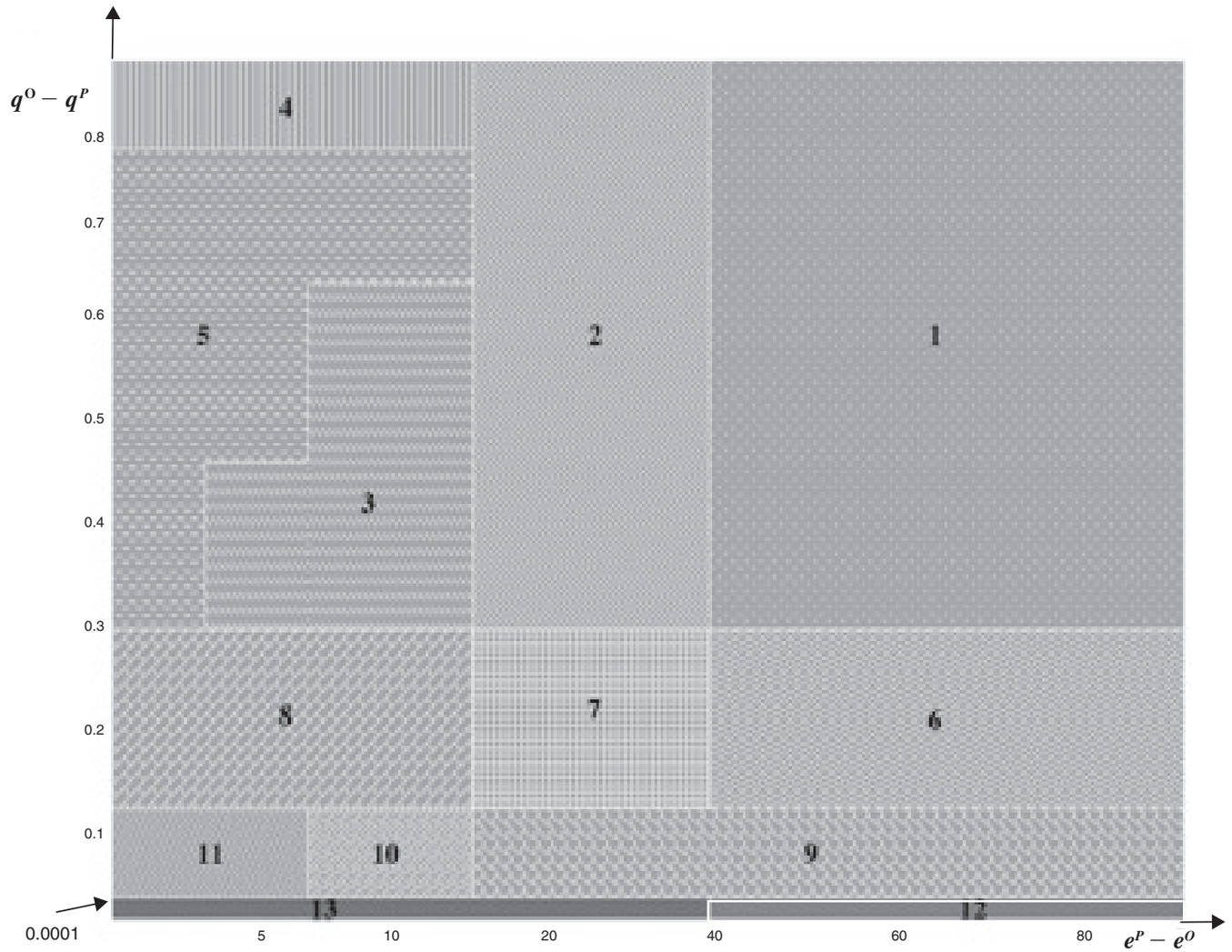

FIGURE 5. ROBUSTNESS ANALYSIS

In all the regions from 1 to 11, contagion occurs in equilibrium.

Differential Contagion

TABLE 13—SIMULATION 6, INCOMPLETE MARKETS WITH COLLATERAL, 3 ASSETS: PRICES

Asset	1	U	D	$(U-D)/U$ %	$(1-D)/1$ %
G	0.8699	0.8864	0.7726	12.8	11.2
B	0.8458	0.8654	0.7298	15.7	13.7
H	0.9311	0.9985	0.7332	26.5	21.2
r_s	0.0000	−0.0015	0.0005		

"Differential" contagion because

G and B have different endogenous values as collaterals.

Wealth Gap Fosters Contagion

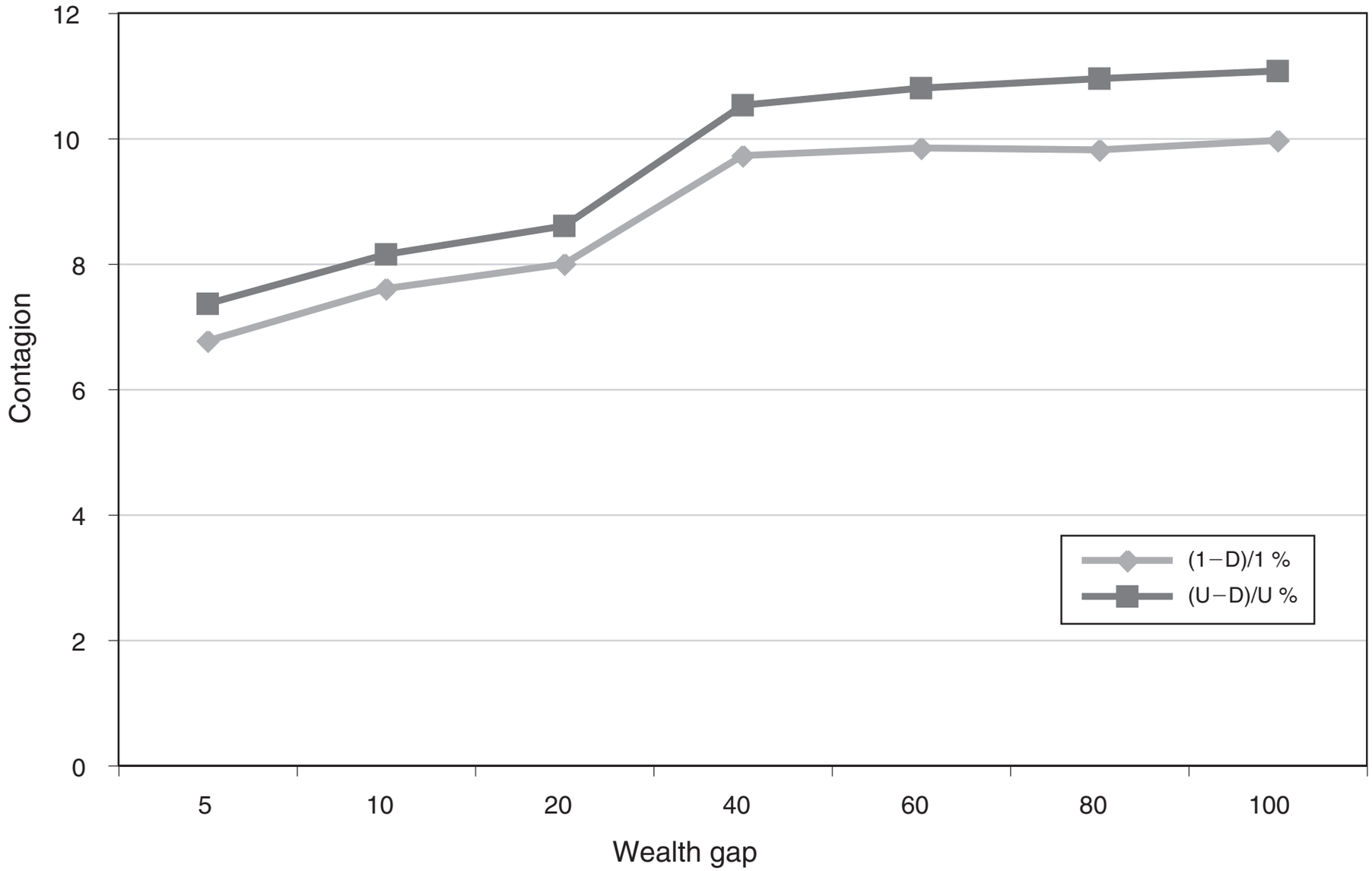

FIGURE 6. CONTAGION FOR DISAGREEMENT LEVEL 0.2

C. Heterogenous Agents & Incomplete Markets (with Collateral *and Adverse Selection*)

(Differential) Contagion

TABLE 15—SIMULATION 7, INCOMPLETE MARKETS WITH COLLATERAL AND ADVERSE SELECTION: PRICES

Asset	1	U	D	$(U-D)/U$ %	$(1-D)/1$ %
G	0.8149	0.8409	0.6957	17.3	14.6
B	0.7807	0.8117	0.6385	21.3	18.2
H	0.8849	0.9967	0.6326	36.5	28.5
r_s	0.0000	0.0000	0.0000		

Issuance Rationing

TABLE 16—SIMULATION 7, INCOMPLETE MARKETS WITH COLLATERAL AND ADVERSE SELECTION: ISSUANCE

Type	1	U	D	$(U - D)/U$ %	$(1 - D)/1$ %
G	0.8018	0.8524	0.0808	90	89.9
B	1.0000	1.0000	0.7500	25	25