



# The great reversals: the politics of financial development in the twentieth century

By Raghuram G. Rajan and Luigi Zingales

What is the  
question  
adressed?

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Le développement du  
secteur financier d'un pays  
facilite son développement  
économique.

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Pourquoi autant de pays ont-  
ils des secteurs financiers  
sous-développés ?

The background of the slide features a dark, semi-transparent overlay of the United States flag on the left and the French flag on the right. The American flag's stars and stripes are visible, while the French flag's vertical blue, white, and red bands are also discernible.

The pattern of  
the levels of  
industrialization  
across countries  
are quite  
different over  
the years,

- In 1913, France's stock market capitalization (as a fraction of GDP) was almost twice that of the United States (0.78 vs. 0.39)
- By 1980, roles had reversed dramatically. France's capitalization was now barely one-fourth the capitalization in the United States (0.09 vs. 0.46)

The problems  
of the  
« incumbents »





## Datas and sample

Etude sur plus de 20 pays développés.

Measure of the deposit to GDP

Measure of the stock market cap to GDP

Measure of the number of companies to population

Measure of equity issues to GFCF

A magnifying glass is positioned over a bar chart. The chart has blue and green bars for each quarter. The word 'Results' is written in large white font across the center of the magnifying glass. To the right of the word, the text 'Lets go to Excell' is written in a smaller white font, separated by a vertical line. The background is a dark blue gradient.

# Results

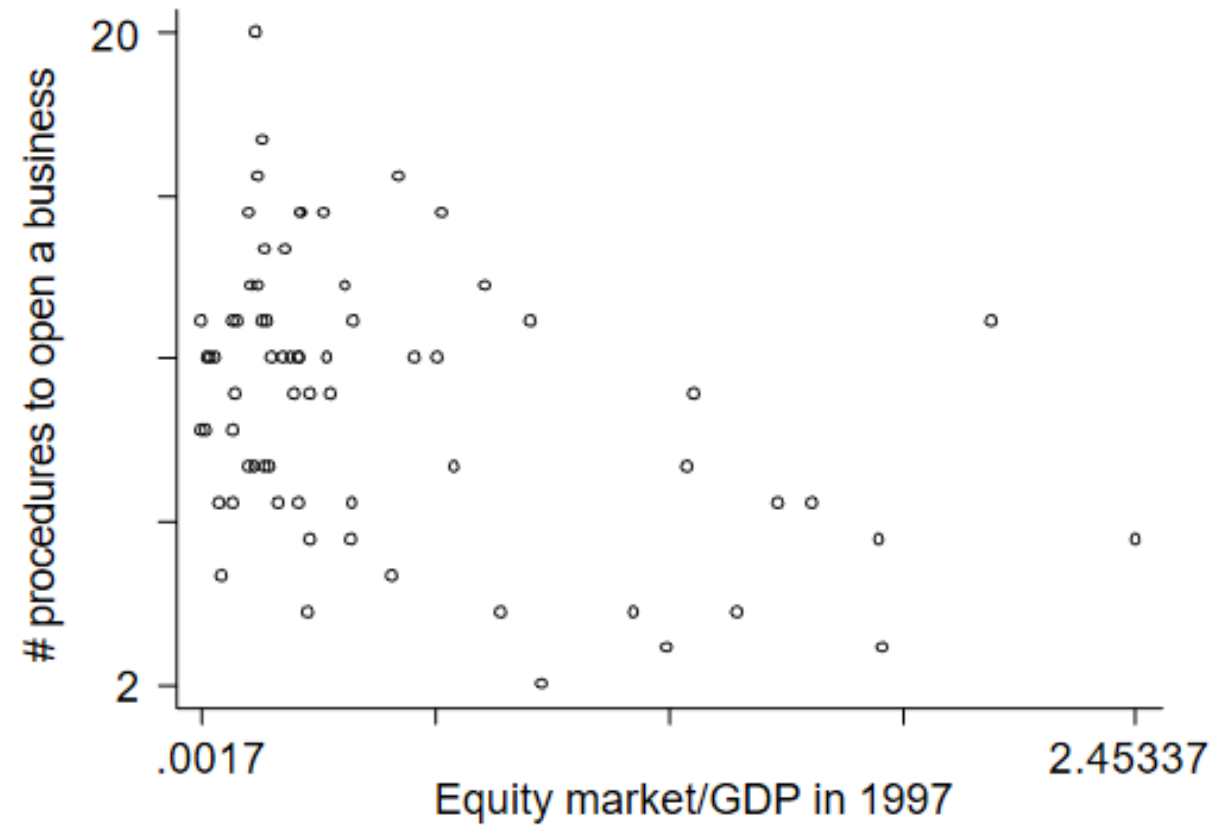
Lets go to Excell

# Conclusion

- Financial systems were highly developed in 1913
- Countries most advanced in 1913 do not necessarily stay advanced
- Indicators of financial development fall then rise between 1913 and 1999

# How important are these results ? What are the explanations?

- The necessity for government intervention.
- The political economy of financial development.
- Financial repression is not the only way to protect incumbent rents.





# An another test : The private interest theory

Here, are theirs hypothesis:

- (1) *For any given level of demand for financing, a country's domestic financial development should be positively correlated with trade openness at a time when the world is open to cross-border capital flows.*
- (2) *The positive correlation between a country's trade openness and financial development should be weaker when worldwide cross-border capital flows are low.*

# Méthodologie:

Ils ont utilisé l'index d'industrialisation de Bairoch :  
reflet du niveau d'industrialisation d'un pays.

# Résultats

Dependent variable	Equity market capitalization/GDP				
	(i)	(ii)	(iii)	(iv)	(v)
<i>Panel A. Equity market capitalization/GDP</i>					
Per capita industrialization	4.61*** (1.52)	2.42 (1.71)	2.11 (2.25)	1.55 (2.05)	8.77** (3.18)
Openness	0.18 (0.11)		-0.04 (0.19)		
Interaction of per-capita industrialization and openness		4.76** (2.03)	5.44 (3.69)	6.62** (3.08)	
Interaction of per-capita industrialization and tariffs					-0.38* (0.22)
Adjusted $R^2$	0.37	0.45	0.42		
Observations	18	18	18	18	17

*Panel B. Number of domestic companies listed/million population*

Dependent variable	No. of companies/million population				
	(i)	(ii)	(iii)	(iv)	(v)
Per-capita industrialization	215.8 (133.6)	-210.6 (116.0)	-199.5 (152.8)	-252.0* (137.0)	927.7** (442.3)
Openness	38.8*** (9.6)		-1.5 (12.7)		
Interaction of per-capita industrialization and openness		924.1*** (138.1)	899.8*** (250.8)	1012.8*** (206.0)	
Interaction of per-capita industrialization and tariffs					-60.9** (29.9)
Adjusted $R^2$	0.50	0.74	0.72		
Observations	18	18	18	18	17

*Panel C. Total securities issued/GDP*

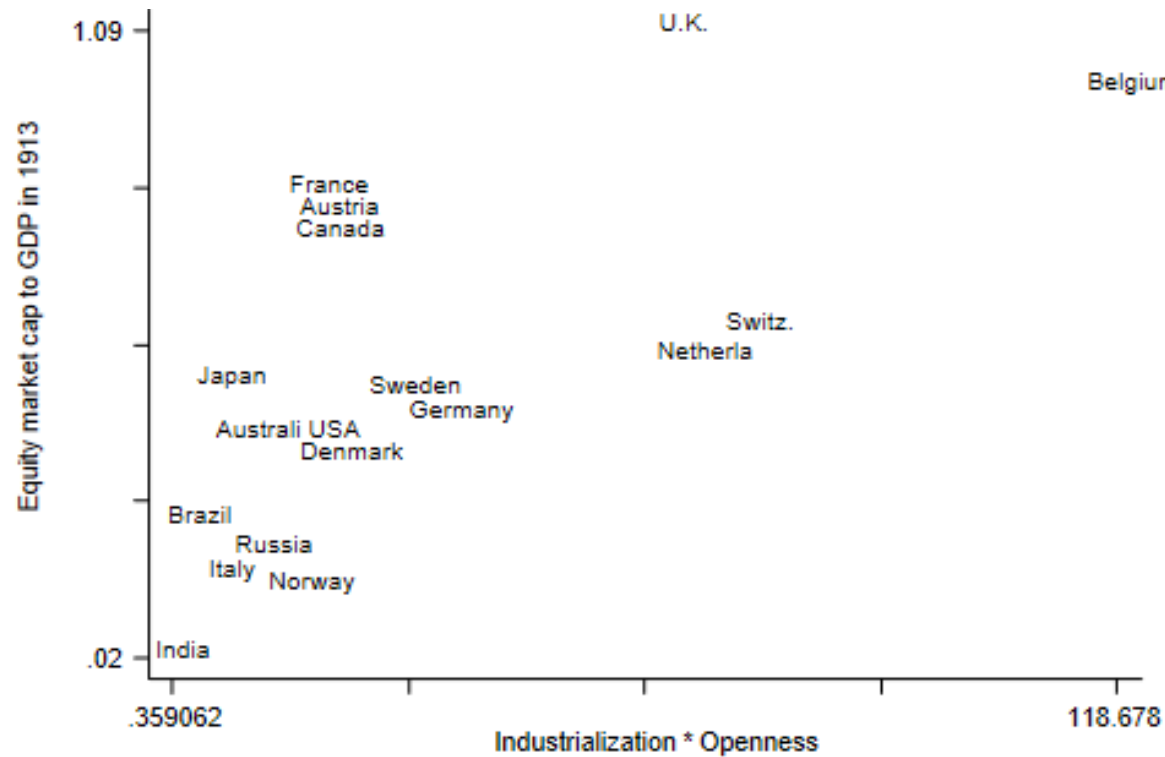
Dependent variable	Securities issued/GDP				
	(i)	(ii)	(iii)	(iv)	(v)
Per-capita industrialization	0.17 (0.10)	0.02 (0.10)	-0.09 (0.12)	-0.02 (0.11)	0.52** (0.22)
Openness	0.01 (0.01)		-0.01 (0.01)		
Interaction of per-capita industrialization and openness		0.33** (0.11)	0.56** (0.19)	0.41** (0.17)	
Interaction of per-capita industrialization and tariffs					-0.03* (0.01)
Adjusted $R^2$	0.14	0.39	0.44		
Observations	17	17	17	17	17

	Mean	Standard deviation	Minimum	Maximum	Observations
<i>Panel A. Summary statistics</i>					
Equity market capital/GDP	0.490	0.294	0.02	1.09	18
Issues to GDP in 1912	0.022	0.015	0.002	0.055	17
Per capita industrialization	49.5	37.08	2	126	18
Openness (trade volume/GDP)	0.59	0.51	0.11	2.32	18
Tariffs	13.0	9.5	0.4	37.4	17
Interaction of per capita industrialization and openness	29.1	31.1	0.36	118.67	18

*Panel B. Pairwise correlations between variables (significance in parentheses)*

	Equity market cap to GDP	Per capita industrialization	Openness (trade volume/GDP)	Tariffs
Per capita industrialization	0.58 (0.01)			
Openness (trade volume/GDP)	0.33 (0.19)	0.01 (0.98)		
Tariffs	-0.37 (0.15)	-0.24 (0.35)	-0.37 (0.15)	
Interaction of per capita industrialization and openness	0.67 (0.00)	0.55 (0.02)	0.69 (0.00)	-0.37 (0.15)

# Résultats



- Market capitalization versus interaction between industrialization and openness. On the x-axis we have the product between the level of per capita industrialization of a country and its level of openness.
- On the y-axis we report a measure of financial development : the equity market capitalization to GDP ratio in 1923

# Les nouveautés qu'apporte cette étude : 4 contributions

- Il y a eu un revirement des marchés financier qui a été opéré après la Grande Dépression.
- Cette étude a apporté de nouvelles preuves de la corrélation entre développement des marchés financier et ouverture aux échanges.
- Ces résultats sont cohérents avec le fait que les groupes d'intérêts (politiques) sont un important facteur dans le développement économique d'un pays.
- Les institutions financières d'un pays peuvent ralentir ou accélérer les activités de celui-ci.

**The Market for  
Equity Options  
in the 1870s**





# Researched problem

- The introduction of exchange-traded options in 1973 led to explosive growth in the stock options market.
- But put and call options on equity securities have existed for more than a century. Hence, these options were priced.
- This article examine these financial products to determine how well the options were priced.

# Data and Methodology

- Durant les années 1870, chaque samedi était publié les cotations sur option d'un unique broker dans une revue sur 20 différentes options.
  - Aucun prix de transactions.
  - 12 stocks étaient cotés dans cette revue. Les cours haut et bas étaient reportés chaque jour.
- 
- Méthodologie : utilisation d'un modèle binomiale en partant du dernier prix à expiration (backward).
  - Calcul de la volatilité : méthode de Parkinson.

# Results

**Table I**

## **Stock Privilege Ask Quote Distribution**

The distribution of observations when theoretical lower and upper bounds are compared to the fixed market price—including commissions—of \$1.0625 per share for buying a stock privilege (option). The bounds are estimated from a binomial option pricing model using ask quotes. The sample comprises all available ask quotes from January 1873 through June 1875 for the companies listed.

Company	Calls				Puts			
	Under	Fair	Over	Total	Under	Fair	Over	Total
NY Central & Hudson	1	8	90	99	1	8	90	99
Lake Shore	2	18	79	99	1	23	74	98
Rock Island	0	7	92	99	0	8	91	99
Erie	6	9	83	98	4	13	81	98
Pacific Mail	8	19	72	99	6	26	65	97
Northwestern	2	13	46	61	1	21	62	84
Western Union Telegraph	3	17	78	98	4	23	71	98
Ohio & Mississippi	0	2	97	99	0	7	92	99
Union Pacific	6	11	81	98	6	18	75	99
Wabash	3	8	86	97	3	12	84	99
Columbus Chicago & Indiana Central	2	3	92	97	2	6	89	97
St. Paul	1	11	82	94	1	15	78	94
Total observations	34	126	978	1,138	29	180	952	1,161
Percentage of total	3%	11%	86%	100%	2%	16%	82%	100%

**Table II**

## **Stock Privilege Bid Quote Distribution**

The distribution of observations when theoretical lower and upper bounds are compared to the fixed market price—including commissions—of \$0.9375 per share for writing a stock privilege (option). The bounds are estimated from a binomial option pricing model using bid quotes. The sample comprises all available bid quotes from January 1873 through June 1875 for the companies listed.

Company	Calls				Puts			
	Under	Fair	Over	Total	Under	Fair	Over	Total
NY Central & Hudson	4	14	57	75	2	15	58	75
Lake Shore	4	27	42	73	4	27	44	75
Rock Island	1	15	59	75	1	16	58	75
Erie	3	12	59	74	3	10	61	74
Pacific Mail	7	25	43	75	10	30	34	74
Northwestern	1	15	24	40	2	19	41	62
Western Union Telegraph	12	25	36	73	8	35	31	74
Ohio & Mississippi	4	14	57	75	4	13	57	74
Union Pacific	3	22	50	75	4	30	41	75
Wabash	5	22	47	74	5	22	48	75
Columbus Chicago & Indiana Central	2	10	62	74	4	20	50	74
St. Paul	3	20	46	69	2	29	39	70
Total observations	49	221	582	852	49	266	562	877
Percentage of total	6%	26%	68%	100%	6%	30%	64%	100%

# Buying strategy returns

Company	(A)	(B)	(C)	(D)
Calls				
NY Central & Hudson	97	19	\$1.39	\$ 26.375
Lake Shore	97	14	2.18	30.500
Rock Island	97	13	0.92	12.000
Erie	96	7	2.14	15.000
Pacific Mail	97	9	1.72	15.500
Northwestern	60	8	2.88	23.000
Western Union Telegraph	96	17	1.53	26.000
Ohio & Mississippi	97	12	1.98	23.750
Union Pacific	96	22	4.24	93.250
Wabash	95	5	1.03	5.125
Columbus Chicago & Indiana Central	96	6	1.46	8.750
St. Paul	92	15	2.58	38.750
Totals	1,116	147	\$2.16	\$ 318.00
Puts				
NY Central & Hudson	97	27	\$2.08	\$ 56.125
Lake Shore	96	38	2.85	108.375
Rock Island	97	24	3.66	87.750
Erie	96	29	2.92	84.750
Pacific Mail	95	32	4.73	151.500
Northwestern	83	35	3.40	118.875
Western Union Telegraph	96	20	5.08	101.500
Ohio & Mississippi	97	37	2.28	84.500
Union Pacific	97	36	1.92	69.250
Wabash	97	46	3.64	167.250
Columbus Chicago & Indiana Central	96	35	3.09	108.125
St. Paul	92	31	2.98	92.500
Totals	1,139	390	\$3.16	\$1,230.50

## Conclusion and novelties

Les marchés financiers des années 1870 montrent un degré de sophistication qui est très largement admis. Pour les acteurs du marché de cette époque intéressé par les put/call les options offraient de grosses opportunités le pricing d'options était déjà très différents de l'époque contemporaine mais ils étaient (empiriquement) overpricer si l'on compare avec les modèles actuels. Les options étaient attractives pour ceux qui les vendaient mais pas pour ceux qui voulaient investir dedans.

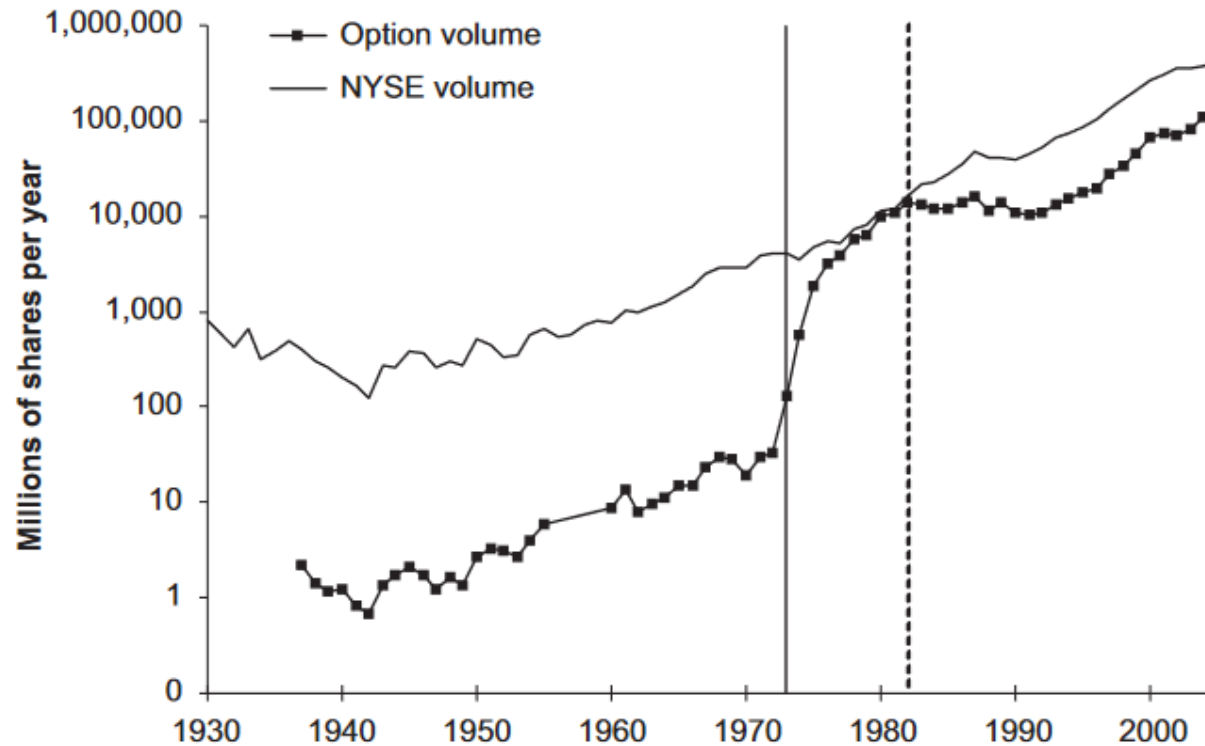
# Option markets and implied volatility: Past versus present

• By Scott Mixon





# Context



- Same as the previous study : option market has exploded in 1973 but these financial products existed before.

# How is this problem attacked?

- Mixon has made 7 hypothesis :
  1. At-the-money (ATM) implied volatility tends to exceed realized volatility.
  2. The cross-section of implied volatility matches the cross-section of realized volatility.
  3. In the time series, implied volatility is systematically related to realized volatility.
  4. Implied volatilities are substantially serially correlated.
  5. Changes in ATM implied volatility are positively correlated across stocks.
  6. Changes in implied volatility are negatively correlated with changes in the price of the underlying stock.
  7. Changes in implied volatility skew are positively correlated across stock.

# Datas

- Mixon a choisi de prendre les 20 stocks qui étaient les plus actifs sur les marchés.
- Options were daily reported in the Commercial and Financial Chronicle from jan 1873 to jun 1875.
- It was broker's quote

Historical sample (1873–1875)		Modern sample (2001–2004)	
Symbol	Firm name	Symbol	Firm name
NYC&H	New York Central & Hudson River	MSFT	Microsoft
LS	Lake Shore & Michigan Southern	CSCO	Cisco Systems
C&RI	Chicago, Rock Island & Pacific	TWX	Time Warner
ERIE	Erie Railway	GE	General Electric
PM	Pacific Mail Steamship Co.	INTC	Intel Corporation
NW	Chicago & Northwestern	IBM	IBM
NWP	Chicago & Northwestern pref.	C	Citigroup
WU	Western Union Telegraph	ORCL	Oracle Corporation
O&M	Ohio & Mississippi	TYC	Tyco International
UNP	Union Pacific	DELL	Dell Computer
WAB	Toledo, Wabash & Western	QCOM	QUALCOMM
CCIC	Columbus, Chicago & Indiana Central	EMC	EMC Corporation
BH&E	Boston, Hartford & Erie	HPQ	Hewlett-Packard
SP	Milwaukee & St. Paul	NOK	Nokia ADR
SPP	Milwaukee & St. Paul pref.	TXN	Texas Instruments
H&SJ	Hannibal & St. Joseph	JPM	JPMorgan Chase
HAR	New York & Harlem	WMT	Wal-Mart
		PFE	Pfizer
		LU	Lucent Technologies
		YHOO	Yahoo! Inc.

# Methodology



Mixon made many regression to prove his hypothesis.



Looked for correlation between stocks

Results:

Hypothesis 1

Historical sample (1873–1875)				Modern sample (2001–2004)			
Firm	OBS	IV	RV	Firm	OBS	IV	RV
NYC&H	101	14.0	7.0	MSFT	208	33.2	27.8
LS	105	18.9	12.6	CSCO	209	49.9	43.2
C&RI	101	16.3	8.1	TWX	209	42.2	38.4
ERIE	100	45.1	25.8	GE	209	30.1	27.3
PM	104	43.7	32.6	INTC	207	44.0	38.5
NW	65	37.7	25.9	IBM	209	29.8	23.7
NWP	27	19.4	6.9	C	208	29.8	27.2
WU	104	22.0	16.1	ORCL	209	50.8	45.4
O&M	105	45.3	23.5	TYC	209	44.8	40.4
UNP	105	45.3	30.9	DELL	206	37.8	35.5
WAB	105	50.7	31.0	QCOM	208	50.1	44.8
CC&IC	99	96.2	41.2	EMC	207	58.0	54.4
BH&E	23	251.4	88.6	HPQ	208	42.9	37.6
SP	96	39.0	22.9	NOK	207	48.8	35.1
SPP	31	22.6	7.0	TXN	207	50.7	47.4
H&SJ	65	60.9	31.3	JPM	208	35.9	31.3
HAR	48	15.8	9.1	WMT	208	27.2	23.7
				PFE	209	27.1	25.6
				LU	136	69.1	56.0
				YHOO	208	60.6	53.5
Average		49.7	24.7	Average		43.1	37.8



## Hypothesis 2

- 19<sup>ème</sup> siècle :

$$\ln(\bar{\sigma}_{it}) = 0.528 + 0.938 \ln(\bar{\sigma}_{it}^r), \quad R^2 = 0.876$$

(0.164) (0.091)

- 20<sup>ème</sup> siècle :

$$\ln(\bar{\sigma}_{it}) = 0.104 + 0.973 \ln(\bar{\sigma}_{it}^r), \quad R^2 = 0.944.$$

(0.058) (0.056)



# Hypothesis 3 and 4

**Table 3**

Implied/realized volatility panel regressions.

The table displays panel regression results for a regression of log implied volatility on the log of trailing realized volatility. Standard errors are reported below each coefficient.

	Historical sample			Modern sample		
	<i>N</i> = 1,384			<i>N</i> = 2,268		
Individual effects	No	Yes	Yes	No	Yes	Yes
Time effects	No	No	Yes	No	No	Yes
Realized volatility	0.727	0.409	0.426	0.753	0.569	0.578
(s.e.)	(0.012)	(0.013)	(0.014)	(0.009)	(0.011)	(0.012)
$\bar{R}^2$	71.2%	88.3%	90.8%	74.7%	81.9%	90.0%
Realized volatility	0.038	0.051	0.041	0.212	0.240	0.291
(s.e.)	(0.005)	(0.005)	(0.006)	(0.016)	(0.016)	(0.016)
Lagged implied volatility	0.964	0.936	0.946	0.695	0.533	0.482
(s.e.)	(0.006)	(0.009)	(0.008)	(0.018)	(0.020)	(0.020)
$\bar{R}^2$	98.8%	98.8%	99.2%	84.8%	86.0%	92.1%

# Hypothesis 5 and 6

**Table 4**

Correlation matrix for implied volatility changes.

Panel A displays the correlation matrix for weekly log changes in ATM implied volatility during the 1873–1875 sample. Panel B displays the correlation matrix for weekly log changes in ATM implied volatility during the 2001–2004 sample.

	NYC&H	LS	C&RI	ERIE	PM	WU	O&M	UNP	WAB	CC&IC
<i>Panel A: Historical sample</i>										
LS	0.55									
C&RI	0.43	0.55								
ERIE	0.15	0.29	0.15							
PM	0.12	0.30	0.01	0.60						
WU	0.47	0.63	0.59	0.21	0.36					
O&M	0.23	0.40	0.53	0.24	0.29	0.51				
UNP	0.13	0.31	0.15	0.55	0.63	0.36	0.34			
WAB	0.09	0.41	0.36	0.44	0.48	0.40	0.56	0.55		
CC&IC	0.01	0.26	0.30	0.07	0.23	0.37	0.48	0.29	0.54	
SP	0.35	0.54	0.56	0.27	0.37	0.70	0.62	0.44	0.55	0.51
	MSFT	CSCO	TWX	GE	INTC	IBM	C	ORCL	TYC	DELL
<i>Panel B: Modern sample</i>										
CSCO	0.49									
TWX	0.51	0.40								
GE	0.37	0.30	0.40							
INTC	0.63	0.41	0.50	0.42						
IBM	0.63	0.35	0.44	0.47	0.62					
C	0.54	0.46	0.51	0.53	0.55	0.54				
ORCL	0.41	0.23	0.35	0.29	0.46	0.40	0.31			
TYC	0.34	0.29	0.46	0.31	0.36	0.35	0.43	0.23		
DELL	0.55	0.50	0.41	0.40	0.58	0.54	0.56	0.45	0.30	
QCOM	0.53	0.39	0.55	0.28	0.56	0.42	0.48	0.36	0.36	0.56
EMC	0.55	0.37	0.36	0.24	0.53	0.55	0.47	0.32	0.34	0.42
HPQ	0.37	0.39	0.44	0.30	0.40	0.35	0.33	0.28	0.31	0.42
NOK	0.48	0.22	0.37	0.29	0.55	0.47	0.45	0.37	0.39	0.44
TXN	0.52	0.34	0.49	0.34	0.60	0.51	0.49	0.49	0.27	0.57
JPM	0.44	0.39	0.47	0.42	0.37	0.50	0.71	0.34	0.44	0.48
WMT	0.49	0.40	0.48	0.50	0.47	0.46	0.50	0.26	0.36	0.44
PFE	0.37	0.21	0.37	0.36	0.29	0.39	0.44	0.19	0.39	0.27
YHOO	0.45	0.23	0.45	0.27	0.43	0.47	0.39	0.33	0.34	0.36

# Conclusion et nouveautés

- Les marchés options des 20<sup>ème</sup> et 19<sup>ème</sup> siècle semblent être à première vue similaire.
- Options were vilified.
- Even sophisticated concepts such as delta hedging of options were intuitively understood by traders more than a century ago. Equity option markets displayed precisely the same empirical regularities in the nineteenth century as they do in the twenty-first century.