



BANK OF ENGLAND

The Bank of England as Lender of Last Resort

Using archives to help answer policy questions

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Views expressed are our own and not attributable to the Bank

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Business Archives Council Conference

The Bank's research agenda and use of archive

- **The Bank of England Archive contains a wealth of historic data that can provide insights into current policy questions**
 - Financial crises especially !
 - How “unconventional” was our response to the 2007/8 crisis ?
- **Some of this has been digitised and researchers can access documents via the Bank's website**
- **However many of the Bank's discount and customer ledgers which are useful for studying financial crises have not been available online**



The Bank's research agenda recognised this

- **One Bank Research Agenda included the aim of disseminating and using more data from the Archive**
- **We should go beyond digitisation/publication and provide datasets (eg in spreadsheets) drawing on the sources**
- **The Bank has now undertaken a project to make some of this data available for researchers**



A manageable project

- ‘Big Data’ problem !



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Project

- **Targeted transcription of key archival material for financial crises**
 - Daily discount and customer ledgers
 - Focused on the crises of 1847, 1857, 1866
 - Provided in machine-readable format/Excel
- **What insights are there for current policy ?**
 - How did the Bank deal with crises in the C19th ?
 - What worked, didn't work ?
 - How similar are the methods to those we have today ?



into this....

[illegible]

Monetary value of bills brought for discount	Rate percent	Loan value	For whom discounted or to whom advanced	Drawing Office Account	Number of bills	Monetary value of bills rejected	No of bills rejected	Monetary value of advance
	10		Agra & Mastermans Bank Limited					50000
4043	10	3639	Alex Bell & Sons		8			
213889	10	192500	Alexander Cunliffes & Co		143			
	10		Alliance Bank Limited					250000
23660	10	21294	A Gibbs & Sons		7			
	10		B S & J Phillips & Co					8000
9809	10	8828	B S & J Phillips & Co		8			
	10		Bank of London Limited					310000
211598	10	190438	Barclay & Co		180			
	10		Barnett & Co					84000
10905	10	9815	Bennison & Lennard		17			
13650	10	12285	Bieber & Co		20			
9808	10	8827	Boutcher Mortimore & Co		10			
22333			Brightwen Gillet & Co		20	22333	20	
32196	10	28976	Brightwen Gillet & Co		25			
24123	10	21711	Brightwen Gillet & Co		28			
10912			Consolidated Discount Co Limited		46	10912	46	
10410	10	9369	Cox Heisch & Co		23			
1111	10	1000	D & T J Warren		2			
	10		Discount Corporation Limited					70000
93799	10	84419	Drake, Kleinwort & Cohen		85			
1900	10	1710	E. Lloyd & Cp		6			
32903			East London Bank Limited		81	32903	81	
157576	10	141818	Frederick Huth & Co		172			
	10		Frederick Youle					17000
4745	10	4271	Frederick Youle		6			
	12		Frith Sands & Co					140000
108338	10	97504	Fruhling & Goschen		112			
39652	10	35687	Frullen Baubury & Co		6			
	10		Gellatly Haukey Howell					8000
4763	12	4191	George Smeed		5			
10930	10	8937	Haarbleichen Schumaum		15	1000	1	
			Harwood Knight & Allen					0
			Harwood Knight & Allen					0
	10		Harwood Knight & Allen					70000
2000	11	1780	Hawes & Co		1			
4705	10	3857	Heilbut, Symons & Co		6	420	1	
880	10	792	Heitz & Deveze		4			
1600	10	1440	Henry Kendall & Sons		2			
2199	12	1935	Hocking Hitchcock & Co		20			
19136	10	17222	Horstman & Co		24			
	10		J & R Morley					15000



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Transcription options – Labour or capital/technology

- **The Bank of England has access to ‘free’ labour**
 - summer interns/students
 - transcription is ‘boring’ and still requires manual checking for mistakes
- **External transcription services are expensive**
 - requires double copy for checking
- **Crowdsourcing possibilities an option**
 - We are trying Zooniverse



Technology

- **Machine learning techniques offer a way of automating transcription**
 - Training a computer to recognise handwritten text and numbers
- **Proof of concept project targeted at our own ledgers**
 - use in-house expertise on machine learning
- **Certain things in our favour make it feasible**
 - Discount office staff turnover low so limits set of handwriting
 - Printed lists of names of key counterparties
- **All sounds eminently “doable” but how far have we got.....**



Machine learning transcription tool



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How far have we got

- **Even for a highly-targeted effort the Holy Grail of automated transcription is still some way off**
 - 80% success rate on numbers
 - Handwriting much more difficult
- **‘Old school’ manual transcription is still important part of the process**
 - Providing an adequate training database
- **Manual intervention at the scanning stage still necessary**
- **Requires significant investment to improve**

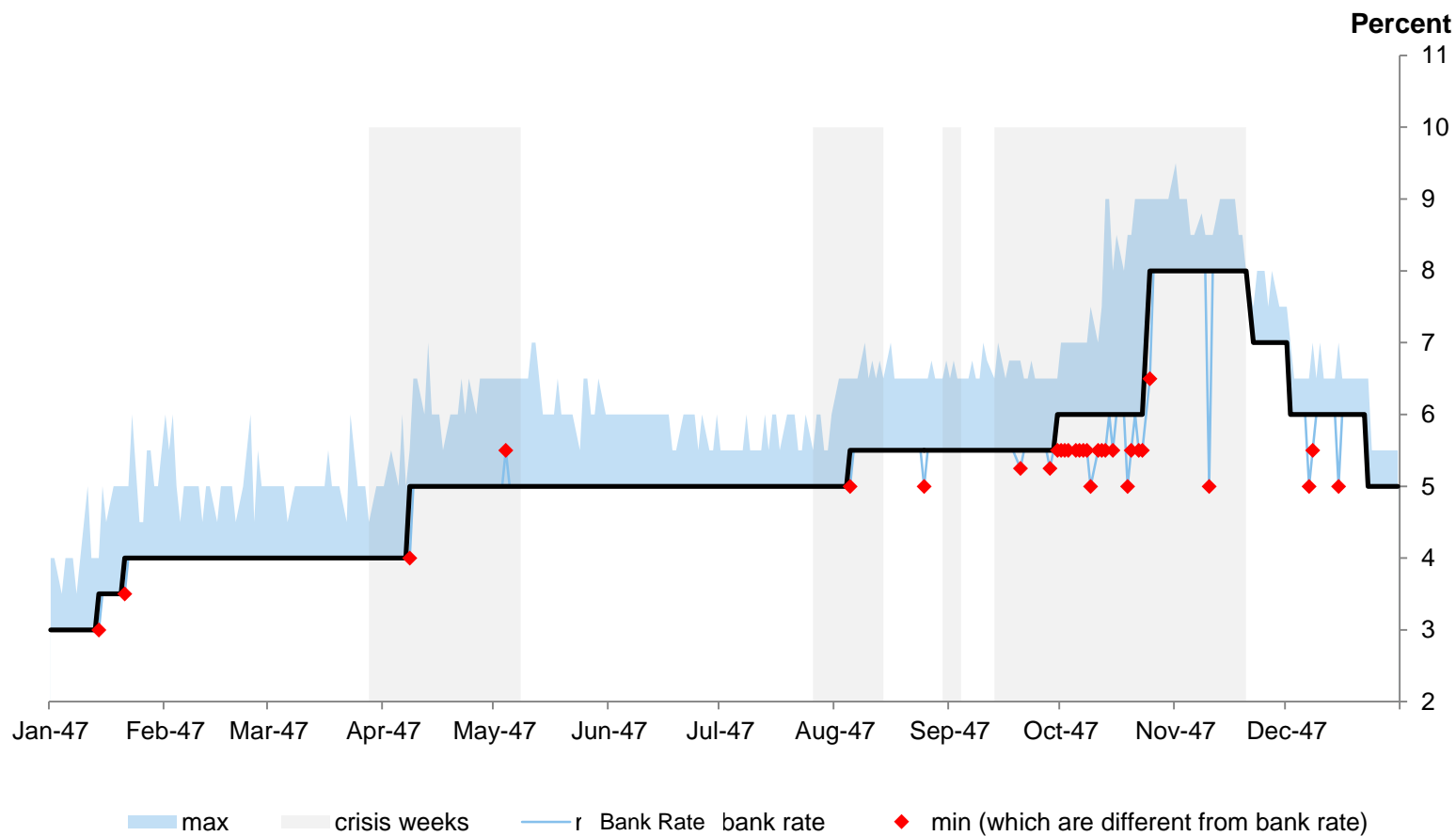


Advantages of ledger data for financial crises

- **High frequency**
 - Daily transactional data is available
- **Rich counterparty information**
 - Discounters, acceptors, and drawers of bills of exchange
- **Price and non-price information**
 - Rates of interest on discounts and advances
 - Information on Bills rejected
 - Maturity



The Bank lends at a range of rates.....



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Customer ledgers - Rothschilds

2245

N. M. Rothschild & Sons

Location of Drawer	Name of Drawer	Date	Amount	Name of Acceptor	Due Date	Amount
Paris	Aguarrevengrat	8/10 1333	with	J. Autho	Dec 25	
	"	227	with	Bischoffshausen & Co	Nov 7	690
	"	"	with	"	"	40
	"	"	with	"	Dec 25	150
	"	1333	with	J. Autho	Nov 25	330
	J. Schmitt	4/10 169	with	J. Autho	Nov 25	330
Bordeaux	Cutler & Co	12/10 2979	on	Willis & Co	Nov 1	740
Neples	G. Rubinaur	1239	on	Heath & Co	1	20
N York	Buck & Co	191	on	J. G. Behrendo	1	20
Riga	Jacobs & Co	479	on	Geo Fenn	1	588
Amstel	J. Meier & Co	1121	on	Manse & Co	2	40
St. Petersburg	W. Brandt & Co	160	on	Brandt & Co	3	500
St. Petersburg	Clason & Co	1702	on	Perkins & Co	2	500
St. Etienne	Balay & Co	1900	on	Parsons & Co	3	1500
	"	"	on	"	3	270
N York	W. H. Mayno & Co	2000	on	Isx & Hinde & Co	3	250
Amstel	B. R. of Mont	1001	on	Glynn & Co	3	220
Palermo	Roma & Co	1211	on	Tennants & Co	3	200
Amstel	Berckemeyer & Co	497	on	Abt & Co	3	300
Riga	Schroder & Co	5009	on	Schroder & Co	3	400
"	"	147	on	"	3	300
Amstel	J. P. & Co	1711	on	Mc Calmont & Co	4	212
Amstel	Schon & Co	1292	on	Wilkins & Co	4	274
"	Mont & Co	195	on	Bell & Co	4	200
Amstel	Dallipin & Co	1159	on	Hambro & Co	4	300
Amstel	Lapote & Co	889	on	Levaux & Co	5	300
Amstel	Zarippi & Co	20171	on	Zigina & Co	5	300
Amstel	Muska & Co	2005	on	L. Phillips & Co	5	300
Amstel	Communing & Co	803	on	Denison & Co	5	300

Favourite counterparties – Magniac Jardine and Co

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16

How much use was the Bank making of all this info

- ‘Big Data’ problem !



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Baring Brothers & Co.

Whence Drawn	DRAWER.	Date of Discount.	Folio.	DISCOUNTER.	Due	DISCOUNTS		ADVANCE
						WITH	UPON	WITH
Paris Sarrana Bordeaux	L. S. Lovenoy S. L. Lovenoy Leclerc & Co	1850 Nov 21		Port from Feb 79			235.738 4 9	119.000 25
				Krautter & Co	Jan 21		200	
				Wells & Co	Jan 21		33 49	
				Morgan & Co	21		500	
			463	Long & Co	4600 Dec 5			
			462	Cumtiff & Co	5			
				do	5			
							236 466 9 6	
							9517129	
							226 948 16 9	119.000 15
Lafayette Sarrana Malaga Havana	S. Brown A. Spalding J. Clements S. Brown	23		Mousson & Co	Dec 20		100	
				Horstmann & Co	Jan 16		3000	
				A. Bell & Co	Jan 6		1000	
				B. & L. Phillips & Co	Dec 14		300	
			466	W. J. W. Alexander & Co	Dec 7			
							231.348 16 9	
							300	
							231 048 16 9	
Boston	W. M. Goddard	24		McCalmer & Co	Jan 19			
			468	Smith & Sons & Co	Dec 8			
			472	R. Lawes & Co	Dec 4			
							675	
							235 373 16 9	
N. Orleans San Manilla Baton Rouge	M. H. H. H. H. H. D. T. S. H. H. H. H. H. H. H. H. H.	25		O. H. H. H. H. H.	Feb 13		500	
				D. Taylor & Sons	25		500	
				H. H. H. H. H.	March 4		500	
				do	4		500	
				Pinto & Co	Feb 17		656 77	
			473	Conrad & Co	17		400	
							200	

Exposure
to Barings

Conclusion

- **Archival project useful to show that the Bank in the C19th was doing many of the things that appear “unconventional” from a C21st perspective**
- **To what extent should they become conventional parts of the armoury today ?**
- **Digitisation and dataset provision useful to preserve institutional memory**

