

# Online Appendix

## Estimating Global Bank Network Connectedness

Mert Demirer

MIT

Francis X. Diebold

University of Pennsylvania

Laura Liu

University of Pennsylvania

Kamil Yılmaz

Koç University

**Corresponding Author:** Kamil Yılmaz; Koç University, Rumelifeneri Yolu, Sariyer, Istanbul 34450 Turkey; kyilmaz@ku.edu.tr; Tel: +90 212 338 1458; Fax: +90 212 338 1393.

## A Global Bank Detail, by Assets

Here we provide detail on our sample of all 96 publicly-traded banks in the world's top 150 (by assets). In Table A1 we show the banks ordered by assets. We report market capitalizations (as of January 15, 2014) and assets (as of December 31, 2013) in billions of U.S. dollars. In addition, we provide our bank codes (which shows country), along with Reuters tickers. The bank codes are easier to understand than the Reuters tickers, particularly as regards to identifying banks' countries; so we use them in our empirical work.

Table A1: Global Bank Detail (Ordered by Assets)

<b>Bank Name</b>	<b>Country</b>	<b>Mcap</b>	<b>Asset</b>	<b>Bank Code</b>	<b>Reuters Ticker</b>
HSBC Holdings	UK	201.0	2,671	hsba.gb	hsba.ln
Mitsubishi UFJ Financial Group	Japan	82.2	2,504	mtbh.jp	X8306.to
BNP Paribas	France	100.0	2,482	bnp.fr	bnp.fr
JPMorgan Chase & Co	US	218.0	2,416	jpm.us	jpm
Deutsche Bank	Germany	49.8	2,224	dbk.de	dbk.xe
Barclays	UK	68.2	2,174	barc.gb	barc.ln
Credit Agricole	France	36.7	2,119	aca.fr	aca.fr
Bank of America	US	177.0	2,102	bac.us	bac
Citigroup	US	150.0	1,880	c.us	c
Mizuho Financial Group	Japan	49.7	1,706	mzh.jp	8411.to
Societe Generale	France	51.6	1,703	gle.fr	gle.fr
Royal Bank of Scotland Group	UK	35.6	1,703	rbs.gb	rbs.ln
Sumitomo Mitsui Financial Group	Japan	64.3	1,567	smtm.jp	8316.to
Banco Santander	Spain	103.0	1,538	san.es	san.mc
Wells Fargo	US	243.0	1,527	wfc.us	wfc
ING Groep	Netherland	55.7	1,490	inga.nl	inga.ae
Lloyds Banking Group	UK	96.1	1,403	lloy.gb	lloy.ln
Unicredit	Italy	47.7	1,166	ucg.it	ucg.mi
UBS	Switzerland	80.2	1,138	ubsn.ch	ubsn.vx
Credit Suisse Group	Switzerland	50.3	983	csgn.ch	csgn.vx
Goldman Sachs Group	US	74.2	912	gs.us	gs
Nordea Bank	Sweden	55.6	870	nor.se	ndasek.sk
Intesa Sanpaolo	Italy	45.8	864	isp.it	isp.mi
Morgan Stanley	US	57.7	833	ms.us	ms
Toronto-Dominion Bank	Canada	82.7	827	td.ca	td.t
Royal Bank of Canada	Canada	93.5	825	ry.ca	ry.t
Banco Bilbao Vizcaya Argentaria	Spain	70.8	803	bbva.es	bbva.mc
Commerzbank	Germany	20.6	759	cbk.de	cbk.xe
National Australia Bank	Australia	72.4	755	nab.au	nab.au
Bank of Nova Scotia	Canada	69.8	713	bns.ca	bns.t
Commonwealth Bank of Australia	Australia	110.0	688	cba.au	cba.au
Standard Chartered	UK	52.4	674	stan.gb	stan.ln

*Continued on next page*

Table A1 – *Continued from previous page*

<b>Bank Name</b>	<b>Country</b>	<b>Mcap</b>	<b>Asset</b>	<b>Bank Code</b>	<b>Reuters Ticker</b>
China Merchants Bank	China	35.8	664	cmb.cn	600036.sh
Australia and New Zealand Banking Group	Australia	77.6	656	anz.au	anz.au
Westpac Banking	Australia	91.8	650	wbc.au	wbc.au
Shanghai Pudong Development Bank	China	29.5	608	shgp.cn	600000.sh
Danske Bank	Denmark	25.6	597	dan.dk	danske.ko
Sberbank Rossii	Russia	59.4	552	sber.ru	sber.mz
China Minsheng Banking Corp	China	29.7	533	cmb.cn	600016.sh
Bank of Montreal	Canada	41.9	515	bmo.ca	bmo.t
Itau Unibanco Holding	Brazil	33.2	435	itub4.br	itub4.br
Resona Holdings	Japan	12.2	434	rsnh.jp	8308.to
Nomura Holdings	Japan	25.6	422	nmrh.jp	8604.to
Sumitomo Mitsui Trust Holdings	Japan	18.4	406	smtm.jp	8309.to
State Bank of India	India	16.5	400	sbin.in	sbin.in
DNB ASA	Norway	28.9	396	dnb.no	dnb.os
Svenska Handelsbanken	Sweden	30.9	388	shba.se	shba.sk
Skandinaviska Enskilda Banken	Sweden	29.1	387	seba.se	seba.sk
Canadian Bank of Commerce	Canada	32.4	382	cm.ca	cm.t
Bank of New York Mellon	US	36.3	374	bk.us	bk.us
U.S. Bancorp	US	74.5	364	usb.us	usb
Banco Bradesco	Brazil	23.5	355	bbdc4.br	bbdc4.br
KBC Groupe	Belgium	26.0	333	kbc.be	kbc.bt
PNC Financial Services Group	US	43.5	320	pnc.us	pnc.us
DBS Group Holdings	Singapore	32.0	318	d05.sg	d05.sg
Ping An Bank	China	19.0	313	pab.cn	000001.sz
Woori Finance Holdings	Korea	8.4	309	wrfh.kr	053000.se
Dexia	Belgium	0.1	307	dexb.be	dexb.bt
Capital One Financial	US	41.5	297	cof.us	cof
Shinhan Financial Group	Korea	18.8	295	shf.kr	055550.se
Swedbank	Sweden	30.8	284	swe.se	sweda.sk
Hua Xia Bank	China	12.4	276	hxb.cn	600015.sh
Erste Group Bank	Austria	16.8	276	ebs.at	ebs.vi
Banca Monte dei Paschi di Siena	Italy	2.9	275	bmpe.it	bmpe.mi
State Street Corporation	US	30.0	243	stt.us	stt.us
Banco de Sabadell	Spain	13.1	225	sab.es	sab.mc
United Overseas Bank	Singapore	25.1	225	uob.sg	u11.sg
Banco Popular Espanol	Spain	1.3	204	pop.es	pop.mc
Industrial Bank of Korea	Korea	6.6	193	ibk.kr	024110.se
BB&T Corp	US	26.6	183	bbt.us	bbt
Bank of Ireland	Ireland	14.6	182	bir.ie	bir.db
National Bank of Canada	Canada	13.1	180	na.ca	na.t
SunTrust Banks	US	20.3	175	sti.us	sti.us
Banco Popolare	Italy	3.6	174	bp.it	bp.mi
Malayan Banking Berhad	Malaysia	26.3	171	may.my	maybank.ku
Allied Irish Banks	Ireland	99.9	162	aib.ie	aib.db
Standard Bank Group	South Africa	17.7	161	sbk.za	sbk.jo
American Express	US	94.7	153	axp	axp
National Bank of Greece	Greece	12.1	153	ete.gr	ete.at

*Continued on next page*

Table A1 – *Continued from previous page*

<b>Bank Name</b>	<b>Country</b>	<b>Mcap</b>	<b>Asset</b>	<b>Bank Code</b>	<b>Reuters Ticker</b>
Macquarie Group	Australia	16.0	143	mqq.au	mqq.au
Fukuoka Financial Group	Japan	3.3	137	ffg.jp	8354.to
Bank Of Yokohama	Japan	6.3	134	boy.jp	8332.to
Pohjola Bank	Finland	5.8	132	poh.fi	poh1s.he
Fifth Third Bancorp	US	18.5	130	fitb.us	fitb.us
Regions Financial	US	14.3	117	rf.us	rf.us
Chiba Bank	Japan	5.2	117	cbb.jp	8331.to
Unipol Gruppo Finanziario	Italy	2.8	116	uni.it	uni.mi
Banco Comercial Portugues	Portugal	5.1	113	bcp.pr	bcp.lb
CIMB Group Holdings	Malaysia	16.3	113	cimb.my	cimb.ku
Bank of Baroda	India	3.7	113	bob.in	bankbaroda.in
Turkiye Is Bankasi	Turkey	8.9	112	isctr.tr	isctr.is
Banco Espirito Santo	Portugal	7.1	111	bes.pr	bes.lb
Hokuhoku Financial Group	Japan	2.5	108	hkf.jp	8377.to
Shizuoka Bank	Japan	6.1	104	shzb.jp	8355.to
Mediobanca Banca di Credito Finanziario	Italy	8.5	95	mb.it	mb.mi
Yamaguchi Financial Group	Japan	2.3	93	yfg.jp	8418.to

## B Global Bank Detail, by Country

In Table B1 we show the same banks by country, starting with those countries with the most banks, and proceeding through those countries with fewer banks.

Table B1: Global Bank Detail (Ordered by Country)

<b>Bank Name</b>	<b>Country</b>	<b>Mcap</b>	<b>Asset</b>	<b>Bank Code</b>	<b>Reuters Ticker</b>
JPMorgan Chase & Co	US	218.0	2,416	jpm.us	jpm
Bank of America	US	177.0	2,102	bac.us	bac
Citigroup	US	150.0	1,880	c.us	c
Wells Fargo	US	243.0	1,527	wfc.us	wfc
Goldman Sachs Group	US	74.2	912	gs.us	gs
Morgan Stanley	US	57.7	833	ms.us	ms
Bank of New York Mellon	US	36.3	374	bk.us	bk.us
U.S. Bancorp	US	74.5	364	usb.us	usb
PNC Financial Services Group	US	43.5	320	pnc.us	pnc.us
Capital One Financial	US	41.5	297	cof.us	cof
State Street Corporation	US	30.0	243	stt.us	stt.us
BB&T Corp	US	26.6	183	bbt.us	BBT
SunTrust Banks	US	20.3	175	sti.us	sti.us
American Express	US	94.7	153	axp	axp
Fifth Third Bancorp	US	18.5	130	fitb.us	fitb.us
Regions Financial	US	14.3	117	rf.us	rf.us
Mitsubishi UFJ Financial Group	Japan	82.2	2,504	mtbh.jp	X8306.to
Mizuho Financial Group	Japan	49.7	1,706	mzh.jp	8411.to
Sumitomo Mitsui Financial Group	Japan	64.3	1,567	smtm.jp	8316.to
Resona Holdings	Japan	12.2	434	rsnh.jp	8308.to
Nomura Holdings	Japan	25.6	422	nmrh.jp	8604.to
Sumitomo Mitsui Trust Holdings	Japan	18.4	406	smtm.jp	8309.to
Fukuoka Financial Group	Japan	3.3	137	ffg.jp	8354.to
Bank Of Yokohama	Japan	6.3	134	boy.jp	8332.to
Chiba Bank	Japan	5.2	117	cbb.jp	8331.to
Hokuhoku Financial Group	Japan	2.5	108	hkf.jp	8377.to
Shizuoka Bank	Japan	6.1	104	shzb.jp	8355.to
Yamaguchi Financial Group	Japan	2.3	93	yfg.jp	8418.to
Toronto-Dominion Bank	Canada	82.7	827	td.ca	td.t
Royal Bank of Canada	Canada	93.5	825	ry.ca	ry.t
Bank of Nova Scotia	Canada	69.8	713	bns.ca	bns.t
Bank of Montreal	Canada	41.9	515	bmo.ca	bmo.t
Canadian Bank of Commerce	Canada	32.4	382	cm.ca	cm.t
National Bank of Canada	Canada	13.1	180	na.ca	na.t
Unicredit	Italy	47.7	1,166	ucg.it	ucg.mi
Intesa Sanpaolo	Italy	45.8	864	isp.it	isp.mi
Banca Monte dei Paschi di Siena	Italy	2.9	275	bmpe.it	bmpe.mi
Banco Popolare	Italy	3.6	174	bp.it	bp.mi
Unipol Gruppo Finanziario	Italy	2.8	116	uni.it	uni.mi

*Continued on next page*

Table B1 – *Continued from previous page*

<b>Bank Name</b>	<b>Country</b>	<b>Mcap</b>	<b>Asset</b>	<b>Bank Code</b>	<b>Reuters Ticker</b>
Mediobanca Banca di Credito Finanziario	Italy	8.5	95	mb.it	mb.mi
National Australia Bank	Australia	72.4	755	nab.au	nab.au
Commonwealth Bank of Australia	Australia	110.0	688	cba.au	cba.au
Australia and New Zealand Banking Group	Australia	77.6	656	anz.au	anz.au
Westpac Banking	Australia	91.8	650	wbc.au	wbc.au
Macquarie Group	Australia	16.0	143	mqg.au	mqg.au
China Merchants Bank	China	35.8	664	cmb.cn	600036.sh
Shanghai Pudong Development Bank	China	29.5	608	shgp.cn	600000.sh
China Minsheng Banking Corp	China	29.7	533	cmb.cn	600016.sh
Ping An Bank	China	19.0	313	pab.cn	000001.sz
Hua Xia Bank	China	12.4	276	hxb.cn	600015.sh
HSBC Holdings	UK	201.0	2,671	hsba.gb	hsba.ln
Barclays	UK	68.2	2,174	barc.gb	barc.ln
Royal Bank of Scotland Group	UK	35.6	1,703	rbs.gb	rbs.ln
Lloyds Banking Group	UK	96.1	1,403	lloy.gb	lloy.ln
Standard Chartered	UK	52.4	674	stan.gb	stan.ln
Banco Santander	Spain	103.0	1,538	san.es	san.mc
Banco Bilbao Vizcaya Argentaria	Spain	70.8	803	bbva.es	bbva.mc
Banco de Sabadell	Spain	13.1	225	sab.es	sab.mc
Banco Popular Espanol	Spain	1.3	204	pop.es	pop.mc
Nordea Bank	Sweden	55.6	870	nor.se	ndasek.sk
Svenska Handelsbanken	Sweden	30.9	388	shba.se	shba.sk
Skandinaviska Enskilda Banken	Sweden	29.1	387	seba.se	seba.sk
Swedbank	Sweden	30.8	284	swe.se	sweda.sk
BNP Paribas	France	100.0	2,482	bnp.fr	bnp.fr
Credit Agricole	France	36.7	2,119	aca.fr	aca.fr
Societe Generale	France	51.6	1,703	gle.fr	gle.fr
Woori Finance Holdings	Korea	8.4	309	wrfh.kr	053000.se
Shinhan Financial Group	Korea	18.8	295	shf.kr	055550.se
Industrial Bank of Korea	Korea	6.6	193	ibk.kr	024110.se
UBS	Switzerland	80.2	1,138	ubsn.ch	ubsn.vx
Credit Suisse Group	Switzerland	50.3	983	csgn.ch	csgn.vx
KBC Groupe	Belgium	26.0	333	kbc.be	kbc.bt
Dexia	Belgium	0.1	307	dexb.be	dexb.bt
Itau Unibanco Holding	Brazil	33.2	435	itub4.br	itub4.br
Banco Bradesco	Brazil	23.5	355	bbdc4.br	bbdc4.br
Deutsche Bank	Germany	49.8	2,224	dbk.de	dbk.xe
Commerzbank	Germany	20.6	759	cbk.de	cbk.xe
Bank of Ireland	Ireland	14.6	182	bir.ie	bir.db
Allied Irish Banks	Ireland	99.9	162	aib.ie	aib.db
State Bank of India	India	16.5	400	sbin.in	sbin.in
Bank of Baroda	India	3.7	113	bob.in	bankbaroda.in
Malayan Banking Berhad	Malaysia	26.3	171	may.my	maybank.ku
CIMB Group Holdings	Malaysia	16.3	113	cimb.my	cimb.ku
Banco Comercial Portugues	Portugal	5.1	113	bcp.pr	bcp.lb
Banco Espirito Santo	Portugal	7.1	111	bes.pr	bes.lb
DBS Group Holdings	Singapore	32.0	318	d05.sg	d05.sg

*Continued on next page*

Table B1 – *Continued from previous page*

<b>Bank Name</b>	<b>Country</b>	<b>Mcap</b>	<b>Asset</b>	<b>Bank Code</b>	<b>Reuters Ticker</b>
United Overseas Bank	Singapore	25.1	225	uob.sg	u11.sg
Erste Group Bank	Austria	16.8	276	ebs.at	ebs.vi
Danske Bank	Denmark	25.6	597	dan.dk	danske.ko
Pohjola Bank	Finland	5.8	132	poh.fi	poh1s.he
National Bank of Greece	Greece	12.1	153	ete.gr	ete.at
ING Groep	Netherlands	55.7	1,490	inga.nl	inga.ae
DNB ASA	Norway	28.9	396	dnb.no	dnb.os
Sberbank Rossii	Russia	59.4	552	sber.ru	sber.mz
Turkiye Is Bankasi	Turkey	8.9	112	isctr.tr	isctr.is
Standard Bank Group	South Africa	17.7	161	sbk.za	sbk.jo