



# **Social Network Analysis of Central Bank Communication**

*(Group D)*

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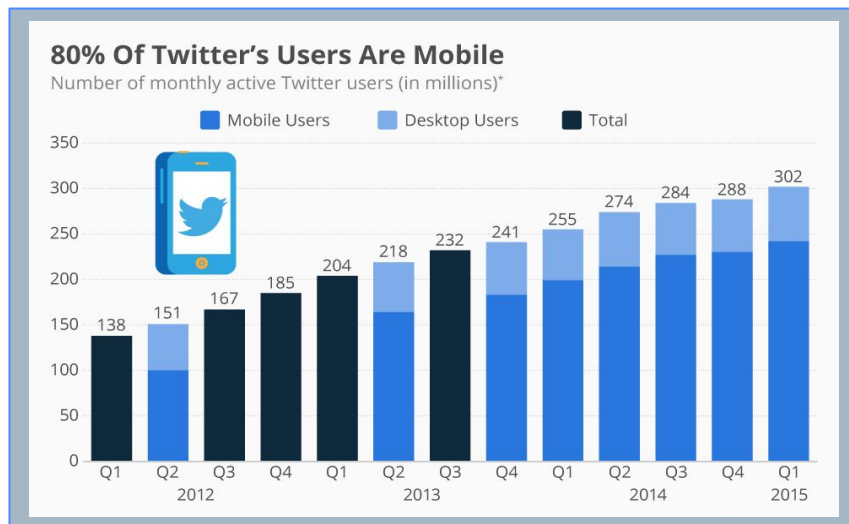
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# Central banks in many countries have taken the initiative to set up new channels of communication, including Twitter.

- As people increasingly connect through social media, Many countries' central banks have opened new avenues for public communication to keep updating with all citizens.
- Twitter is one of the most popular social media platforms used by most central banks as a new avenue of communication that allows real-time two-way contact and spreads virally.
- This analysis aims to investigate the methodologies to improve the communication of central banks via Twitter.
- Our group then selected four central banks for this observational study based on two levels of development: developed and developing countries.



# Number of Twitter users & Number of central bank's followers



Source : <https://www.statista.com/chart/1520/number-of-monthly-active-twitter-users/>

## HOW THE GLOBAL CENTRAL BANKS STACK UP

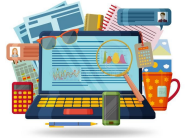
	Twitter followers (In thousands)	US Treasury holding (in \$ bn*)	Forex reserves holding (in \$ bn**)
Reserve Bank of India	1,000+	213.5	572.7
People's Bank of China	NA	1,061.7	3,128.0
Banco de Mexico	774.6	49.2	199.8
Bank Indonesia	757.9	NA	133.6
US Federal Reserve	677.6	NA	139.7 <sup>#</sup>
European Central Bank ***	591.3	NA	NA
Banco Central BR (Brazil)	382.2	265.1	354.5
Bank of England	317.3	428.9	177.7
Bank of Canada	180.4	128	90.8
State Bank of Pakistan	117.0	NA	12.9
Reserve Bank of Australia	49.2	38.3	43.3
Banque de France***	37.1	135.4	221.2
Deutsche Bundesbank ***	30.0	74.8	227.1
Bank of Japan	28.9	1,276.2	1,389.7
Banca d'Italia***	25.4	44	207.8
Banco de España***	15.9	41.3	79.9

\* As of September 2020; \*\* Per availability in September or October ; \*\*\*Forex numbers are not much relevant for Eurozone central banks as they are under ECB; # US Fed prints the reserve currency and can produce an unlimited amount of the dollars  
Source: Twitter, US Treasury, Wikipedia

## The data is obtained from the Twitter account of 4 central banks.

THE LEVEL OF DEVELOPMENT	COUNTRY	CENTRAL BANK	TWITTER
Developed Countries	US 	Federal Reserve 	@federalreserve
	Canada 	Bank of Canada  BANK OF CANADA BANQUE DU CANADA	@bankofcanada
Developing Countries	Thailand 	Bank of Thailand  ธนาคารแห่งประเทศไทย BANK OF THAILAND	@bankofthailand
	Mexico 	Banco de México  BANCO DE MÉXICO	@Banxico

# Step-by-step process by using three analytical methodologies



- **Twitter** → to observe and elicit data from **four central banks**

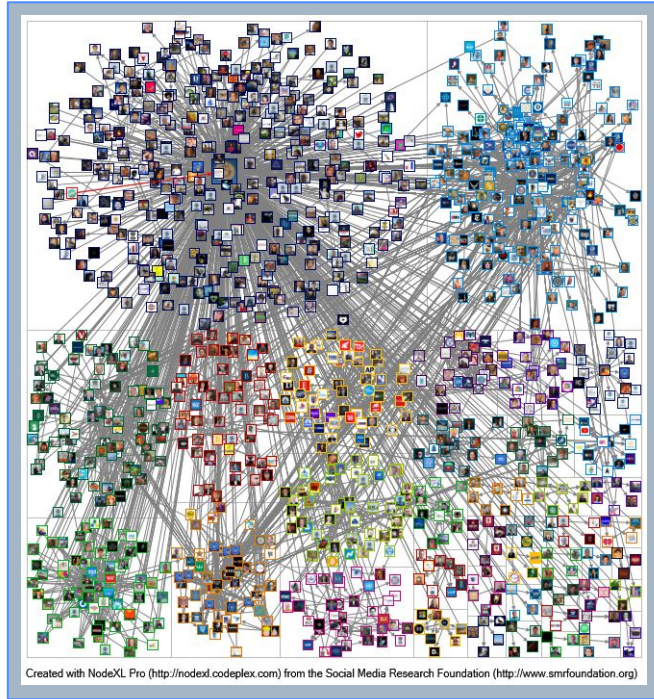


- **NodeXL** → to create and analyze the network charts, a table of indicators, and a table of network statistics

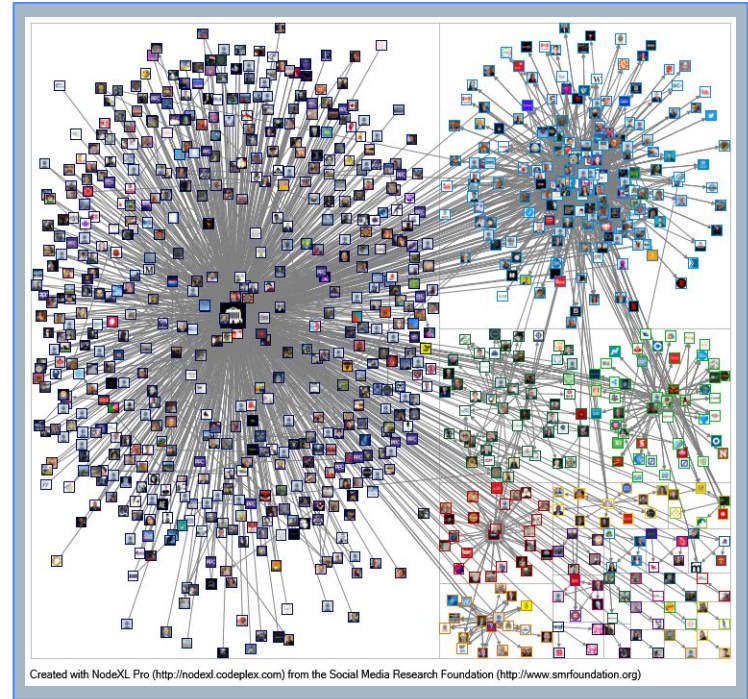


- **Microsoft Excel** → to conduct tables and graphs illustrating the results

# The network chart of each central bank in the developed countries

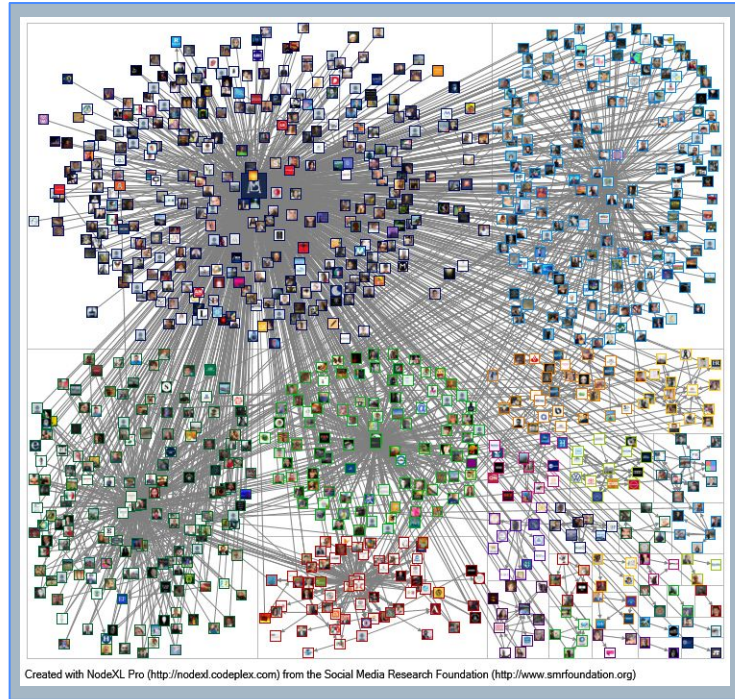


**Federal Reserve (FED)**

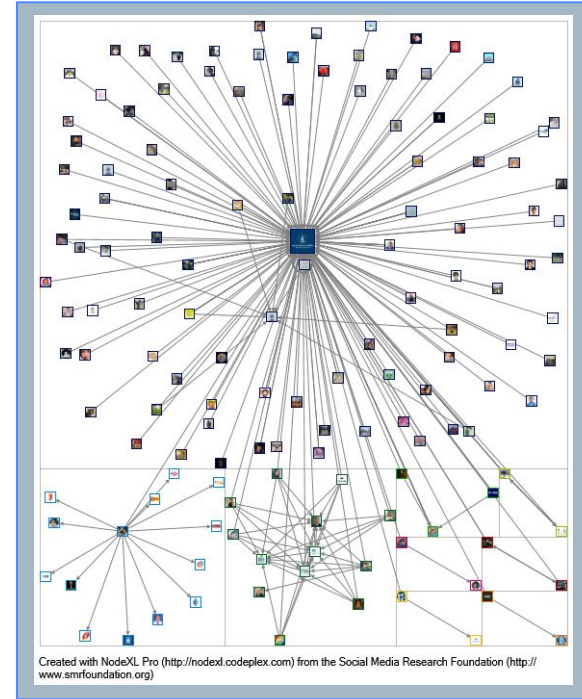


**Bank Of Canada (BOC)**

# The network chart of each central bank in the developing countries



**Bank Of Mexico (BOM)**



**Bank Of Thailand (BOT)**

## Developed countries have the number of main messaging activities among four Twitter networks higher than developing countries.



The Number of Main Messaging Activities among 4 Twitter Networks	Developed Countries				Developing Countries			
	US		Canada		Thailand		Mexico	
The Number of Tweets	9	0.12%	8	0.18%	29	10.36%	24	0.79%
The Number of Retweets	286	3.74%	565	12.43%	158	56.43%	731	24.07%
The Number of Replies to	609	7.97%	333	7.33%	16	5.71%	197	6.49%
The Number of MentionsInRetweet	755	9.88%	2231	49.10%	40	14.29%	1205	39.68%
The Number of Mentions	5979	78.28%	1407	30.96%	37	13.21%	880	28.98%
Total	7638	100.00%	4544	100.00%	280	100.00%	3037	100.00%

*The table of indicators*

- The **FED** has the highest total number of main messaging activities, while that of the **BOT** is the lowest.
- According to the **FED, BOC, and BOM**, the number of Mentions and Mentions in Retweet are significantly high in terms of percentage while more than half of the number of activities in the **BOT** is the number of retweets.



# Comparison of the overall metrics between four central banks

Overall Metrics	Developed Countries		Developing Countries	
	US	Canada	Thailand	Mexico
Graph Metric	Value	Value	Value	Value
Graph Type	Directed	Directed	Directed	Directed
Vertices	1207	938	141	996
Unique Edges	1882	2163	169	2158
Total Edges	7638	4544	280	3037
Maximum Geodesic Distance (Diameter)	4	4	4	4
Average Geodesic Distance	2.916818	2.475757	2.212464	2.326469
Graph Density	0.001738065	0.002958223	0.009675785	0.002507518
Modularity	0.253852	0.401892	0.387765	0.4753

*The table of network statistics*

- The **FED, BOC, and BOM have strong edges**, creating clusters of highly connected groups, whereas the **BOT has weak edges** that are less likely to follow such tendency and often connect different clusters.
- The **BOM** has the highest modularity with low density where a group of individuals are loosely connected; this is highly modular networks.
- The **BOT** has the highest graph density network, where users are highly interlinked, with low modularity; this is a single dense group, a unified community.

# BOM has the highest proportion of Twitter followers to all social media users, implying that Mexicans use Twitter relatively more than other countries.



- The **BOM** has the highest number of followers (835.8K) compared to others, followed by the **FED, BOC, and BOT** respectively.
- **The proportion of Twitter followers to all social media users** determines how many citizens get access to Twitter, compared to other social media platforms.

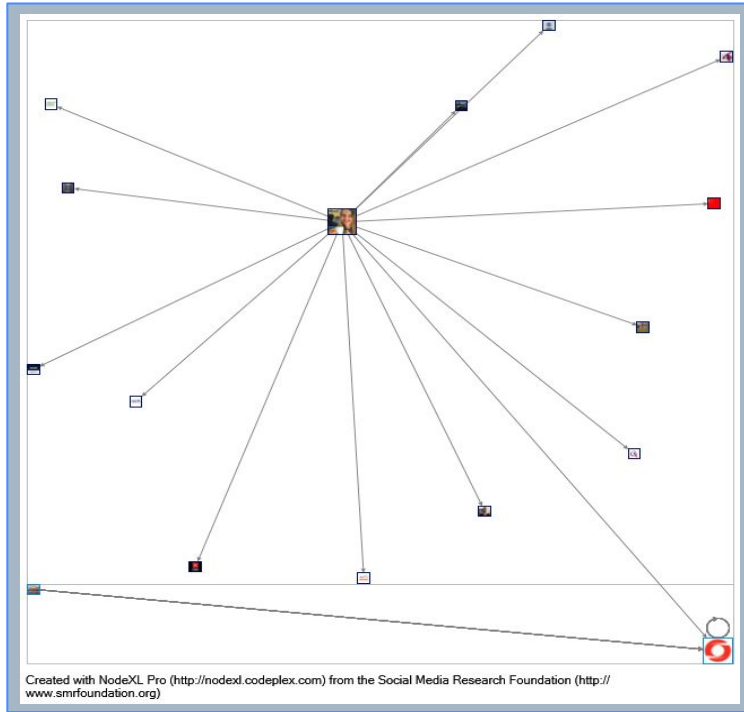
- BOM => 1.09%

- BOC => 0.60%

- FED => 0.35%

- BOT => 0.09%

# The limitation of Twitter Platform



- The performance of Twitter platform can not fully measure the productivity of the financial institution.
- Although the Twitter platform in Singapore is not popular, Bank of Singapore still have a high performance.

**Bank Of Singapore**

## Key Findings



1. **The number of followers** is one of the crucial factors that influence the reach on central bank's twitter.
2. **Central Banks with loyal followers can have a large impact on conversation.**
  - FED, BOM, and BOC have a highly significant number of vertices. These central banks have high number of people or things in the network, and allow for the effective management of data distribution to the general public.
  - On the other hand, BOT has a very low number of vertices. Therefore, it needs further improvement on its distribution of data.
3. **According to BOT, the proportion of retweets to tweets is equal to 5 on average, which is considered as the lowest one among other three central banks.**
4. **The higher number of tweets does not mean the higher interaction.**
  - Many people may think that the number of accounts owner's tweets is the most important, but they are not. For example, BOT has the highest number of tweets, but its followers do not tend to respond much to what BOT tweeted.
5. **No matter a particular country is developed or developing countries, the level of information distribution can be varied.**
  - The central bank from developed countries like BOM has a high performance.

# Policy Recommendations



- Governments should **encourage people to use Twitter** as one of the main communication channels.
- Governments should **support and promote the central bank's Twitter accounts** to increase the interaction, responses and other activities.
- **BOT should pay more attention to the contents on its Twitter account** because the number of tweets is higher, contrasting with the lower number of retweets compared to other countries.
- Governments should **concentrate on expanding and improving general internet access.**

# Thank you Q&A?

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