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**Quantitative Analysis of Adaptive Behavior in Money Laundering
Patterns to Avoid Detection**

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ABSTRACT

Financial institutions employ multiple resources to combat financial crimes such as money laundering and terrorism financing. Automated systems use combinations of rules or scenarios, value thresholds, peer group activity, rolling analysis of actual activity to historical activity, tolerances based on customer risk ratings, and often, artificial intelligence to identify atypical activity. Human intervention involves investigating, determining and documenting the rationales for closing an investigation without further escalation or reporting banks' customers' potentially suspicious behavior and transactional activity.

Criminals, money launderers and those who aid the formers' activities are well aware of financial institutions' efforts to identify suspicious activity. Their awareness may derive from reading typologies of financial crimes frequently published by multinational organizations and financial intelligence units (FIUs), receiving questions on transactions from their banks or via requests for information from their bank's correspondents. The types of questions posed can focus on specific transactions, ownership or counterparties to transactions. These questions may offer insights into their bank's current focus on financial crime prevention activities.

As a result of financial institutions' efforts to detect atypical transactions and comply with regulatory requirements to report suspicious activity in a timely manner, criminals and money launderers may identify a need to modify their behavior, transactional activity patterns or types of formation vehicles ("companies") used to transfer value.

Research findings show that money launderers do change their behavior to avoid detection more rapidly than financial institutions may anticipate, particularly in company formations and purported industries of such companies. During a multiple month review conducted for several financial institutions, the transactional analysis disclosed material changes while continuing patterns of atypical inbound and outbound wires.

Results included identification of company formation changes from offshore / economic zone located entities to onshore registered entities where the requirement to include a local national as majority shareholder further masked the actual ownership of the onshore entity. While entity formation types changed, typologies of atypical transactional activity – high velocity of outgoing round dollar wires, lack of incoming wires in some instances (potential funnel activity), similar country corridors, and micro-activity bursts – continued.

Research results suggest that financial institutions cannot only rely on their automated rules, list of high-risk industry types, customer risk ratings and periodic reviews to prevent each institution from criminal misused. Further, these results underscore the need for financial institutions to adapt their processes more expeditiously as criminals change their behaviors.

EXECUTIVE SUMMARY

Overview

This research sought to identify whether changes in transactional behavior including shifts in counterparty geographies could provide useful insights for financial crime detection and prevention efforts by financial institutions, how quickly transactional changes occurred and other mechanisms to identify shifts in corporate formations.

From December 2016 to December 2019, we assessed SWIFT wires in seven 6-month intervals in Bank A located in country A¹. Customer types included free zone entities, onshore companies, trading and non-trading companies.

After data cleansing, normalization and removal of bank-to-bank wires and third party wires valued at less than \$5,000 each, the final dataset contained 5,955 wires (\$991,994,462). Average value of in- and outbound wires was \$166,582.

Results

1. *Numbers of Onshore and Free Zone companies* significantly increased from December 2016 to December 2019.
2. *Number of FZ companies sending out wires increased* from 0 (December 2016) to 99 (December 2019). *Numbers of FZ companies receiving inbound wires* remained stable at 115 FZ companies between December 2016 and December 2019.
3. *Number of Onshore companies* materially increased 52% from 298 entities (December 2016) to 452 entities (December 2019).
4. *Onshore companies' outbound wire value* increased by 1707% (\$176,749,571) from \$10,357,678 (December 2016) to \$187,117,249 (December 2019)².
5. In December 2016, *Onshore trading companies' outgoing wire value* (\$10,233,983) accounted for 99% of all wire value and *Non-Trading Companies' (NTCs) outgoing wire value* (\$123,695) accounted for less than 1% of all wire value (\$10,357,678). By December 2019, *Onshore trading companies' outgoing wire value* (\$25,720,375) accounted for 12% of all wire value and *NTCs wire value* (\$161,396,874) *comprised 73% of all wire value* (\$221,361,304). *NTC's outgoing wire value increased by an exponential 130380%*.
6. This significant change – higher value transacted by NTCs in Onshore locations – began in June 2017. The behavioral shift from Onshore trading companies to Onshore NTCs suggests that onshore trading companies may have begun to change their business registration to

¹ All data was cleansed and normalized to mask the identity of the financial institutions or the countries involved. No names of underlying customers have been used. The data serves to illustrate or support conclusions reached.

² Onshore companies inbound wire value decreased by 54% (\$31,678,173) from \$58,303,828 (December 2016) to \$26,625,655 (December 2019).

NTCs, possibly in response to heightened awareness generated via FATF's 2018 Professional Money Launderer publication. By December 2019, *onshore trading* companies received significantly lower value (53% less) of total Onshore incoming and outgoing wire value.

7. *Free Zone Non-Trading Companies (NTCs)* began transacting at higher values than Free Zone Trading companies in December 2017. *Overall wire value by FZ NTCs* increased from \$15,784,184 (December 2016) to \$30,253,825 (December 2019), a 240% value increase.
8. During the review period, *overall wire value by FZ Trading Companies* increased from \$10,130,629 (December 2016) to \$23,406,393 (December 2019), a 131% increase in value.
9. More FZ NTCs received wires than FZ Trading companies after June 2017.
10. As Originators of outbound wires, FZ Trading and FZ NTCs showed that more FZ NTCs sent wires than FZ Trading companies beginning in December 2017.
11. Bank A's customers' significant increase in outbound wire value driven primarily by Onshore NTCs.
12. Analysis of counterparty geographies showed that starting slowly in June 2017, new counterparty countries sent funds to Bank A's customers or its customers sent funds to new counterparty countries. This trend grew more evident in outbound wires sent in June 2018 through December 2018.

Conclusion:

1. *Both onshore trading companies, onshore and FZ NTCs* wires increased, mainly in outbound wire value, while simultaneously decreasing receipt of inbound wire value. This observation supports a shift in behavior.
2. The numbers of Onshore companies and FZ NTCs transacting increased significantly across the review periods, possibly reflective of a shift by trading companies out of Free zones towards onshore operations, and by the formation of non-trading companies in free zones.
3. The sharp increases in wire value transacted by Onshore and FZ NTCs indicate a shift in Bank A's customers' usage of its account, to send wires and reduce the amount of wires received.
4. The observation of new beneficiary counterparty geographies potentially indicates another shift by Bank A's existing customers to new suppliers in these countries or Bank A's onboarding of new customers with distinct country preferences.
5. The observation of intermittent and/or non-recurring high value wires sent to new counterparty geographies appears to be another shift and indicator of possibly activity bursts.
6. With the exception of the December 2016 month, changes in geographies, inbound or outbound wire value or numbers of customer types transacting were observed in each 6-month interval. This finding suggests that customers' transactional or behavioral changes occur with greater frequency than expected and might not be detected early enough with periodic transaction reviews such as annual reviews or even via automated alerts, should the volume and value remain in a narrow range.

OVERVIEW

Objective:

When criminals and money launderers identify a need to modify their behavior, transactional activity patterns or types of formation vehicles used to transfer value (“companies”):

1. What forms could reflect the modification?
2. How can behavioral changes by money launderers be identified and measured?
3. How quickly do behavioral modifications manifest?
4. How can financial institutions identify significant changes in their customers’ transactional activity? Are transaction alerts sufficient?

METHODOLOGY

The approach consisted of two primary work streams: transactional analysis and counterparty geographical analysis in one financial institution (“Bank A”) in one country (“country A”).

The objective of this analysis was to identify the types of patterns used by potential money launderers to avoid and / or evade detection by financial institutions.

Transactions

In total, we assessed seven monthly data periods in six-month intervals from December 2016 through December 2019³. The seven monthly periods returned an initial dataset of 8,726 incoming and outgoing, third party commercial payments valued at \$997,293,536.

- After developing the initial dataset, we excluded all Bank-to-Bank wires since the analysis focused on third party commercial, payments sent and received. Bank to bank wires contained SWIFT codes CHI31, certain CHO10s, FWI10, FWO10, SWI202 and SWI202 where banks were found in the originator name and beneficiary name fields.
- Third party wires valued below \$5,000 per transaction were removed from the initial dataset (2,771 wires - \$5,299,074). These transactions reflected very low value incoming and outgoing wires mainly by individuals.

Average value of wires under the \$5,000 threshold was \$1,900 compared to the \$166,582 average value in the final dataset. Removing low value wires had no material impact on research results. Low value wires accounted for 0.5% of total in- and outbound wire value.

- Following removal of Bank to Bank and third party wires below \$5,000, dataset contained 5,955 wires (\$991,994,462). Average value of in- and outbound wires was \$166,582 as shown in the table below.

Month / Year	Debit / Credit	Count	Value	% Value	Average Value
Dec-16	CREDIT	598	\$84,218,642	89%	\$140,834
Dec-16	DEBIT	28	\$10,357,678	11%	\$369,917
Dec-16	Total	626	\$94,576,320		\$151,080
Jun-17	CREDIT	721	\$106,462,901	87%	\$147,660
Jun-17	DEBIT	48	\$15,879,820	13%	\$330,830
Jun-17	Total	769	\$122,342,721		\$159,093
Dec-17	CREDIT	869	\$87,777,689	81%	\$101,010
Dec-17	DEBIT	73	\$20,229,559	19%	\$277,117
Dec-17	Total	942	\$108,007,248		\$114,657
Jun-18	CREDIT	789	\$90,663,646	65%	\$114,910
Jun-18	DEBIT	393	\$48,022,960	35%	\$122,196
Jun-18	Total	1182	\$138,686,606		\$117,332
Dec-18	CREDIT	607	\$116,441,126	95%	\$191,831
Dec-18	DEBIT	55	\$5,786,009	5%	\$105,200

³ The review period covered seven six-month intervals of December 2016, June 2017, December 2017, June 2018, December 2018, June 2019 and December 2019.

Month / Year	Debit / Credit	Count	Value	% Value	Average Value
Dec-18	Total	662	\$122,227,135		\$184,633
Jun-19	CREDIT	529	\$101,602,355	73%	\$192,065
Jun-19	DEBIT	139	\$37,148,955	27%	\$267,259
Jun-19	Total	668	\$138,751,310		\$207,712
Dec-19	CREDIT	481	\$46,041,818	17%	\$95,721
Dec-19	DEBIT	625	\$221,361,304	83%	\$354,178
Dec-19	Total	1106	\$267,403,123		\$241,775
Period	Total	5955	\$991,994,462		\$166,582

- *Incoming* wires (credits) totaled \$633,208,177 in 4,594 wires – average value \$137,834.
- *Outgoing* wires (debits) totaled \$358,786,284 in 1,361 wires – average value \$263,620.

We further considered transactions by four types of Bank A’s customers:

1. **Trading Entities** – companies with the word tradingⁱ in the name⁴
2. **Non-Trading Companies** – companies without “trading” (or a variation) in the name
3. **Free Zone Entities** – companies whose corporate name address referred to a free zone location
4. **Onshore Entities** – companies without a reference in their name or address field to a free zone. Onshore entities include formations such as Limited, Ltd, LLC, Inc., Corporation, or Establishment, among other formation types.

Some overlap occurred between the four customer types in that trading entities may operate in free zones as well as onshore. Similarly, non-trading companies may operate both in a free zone and onshore. However, an onshore company cannot operate in a free zone and, vice versa; a free zone company cannot operate onshore. In addition, free zone companies cannot transact with onshore companies in country A.

Counterparty Geographies

Counterparty geographies include countries to which wires were sent or from which Bank A’s customer received wires.

- For Bank A customers sending outgoing wires (debits), we assessed the wire beneficiaries’ countries of location as provided in the wire data as “**counterparty beneficiary geographies.**”
- For Bank A customers receiving incoming wires (credits), we assessed the wire originators’ countries of location found in the wire data as “**counterparty originator geographies.**”

Across the seven data periods, we evaluated the top 6 counterparty geographies (by wire value) by counterparty originator and counterparty beneficiary geography (abbreviated as “geo”).

⁴ Variations of the word trading were also used, such as Trd, Trade, Trdg, or Tr found in the beneficiary or originator fields and/or in the originator or beneficiary address fields of each wire.

In addition, we considered the distribution of the top six geographies by trading companies; non-trading companies; free zone and onshore companies by the highest wire value per counterparty country in each review period

During the review period, wires took place with more than 140 distinct countries.

- Incoming wires to Bank A's beneficiary customers originated in 134 countries, led by Singapore, Netherlands, UAE, US, Azerbaijan, Bulgaria and Malta.
- Outgoing wires from Bank A's originator customers went to 80 countries, led by the US, China, India, Indonesia, Hong Kong, Singapore, and Canada.

MATERIALS

1. Primary resources used in this analysis comprised inbound and outbound wires obtained via an interface system from SWIFT.
2. A secondary source included several FinCEN advisories - specifically FIN-2018-A006⁵ and FinCEN-2019-A001⁶ - which address Iran's use of trading companies and risks of conducting business with entities associated with Iran, including front and shell companies..."
3. The Financial Action Task Force's July 2018 "Professional Money Laundering"⁷ report proved useful in highlighting vulnerabilities exploited by money launderers in business types and complex laundering schemes, particularly those used by the Altaf Khanani MLO involving wires to and from general trading companies.
4. Internet searches were used to establish a two-digit ISO code for countries where the wires included a partial address; no country code; a city name only; a partial or corrupted country name or incorrect country ISO code⁸.
5. Finally, data cleansing and normalization techniques were deployed to apply consistency across the dataset. For example, wires might be received for ABC Company Limited; however, the company's name in several wires might be spelled ABC Co Limited, ABC Co Ltd, A B C Company Ltd or any one of a number of variations. Based on country A's corporate types and / or an open source search to validate the corporate name, a common spelling of the company name (particularly the corporate extension type) was used.

⁵ FinCEN October 11, 2018, "Advisory on the Iranian Regime's Illicit and Malign Activities and Attempts to Exploit the Financial System" <https://www.fincen.gov/sites/default/files/advisory/2018-10-11/Iran%20Advisory%20FINAL%20508.pdf>

⁶ FinCEN March 8, 2019, "Advisory on the FATF Identified Jurisdictions" pg. 7, https://www.fincen.gov/sites/default/files/advisory/2019-03-08/FAFT_Advisory_March_final_508.pdf

⁷ FATF July 2018, "Professional Money Laundering" <http://www.fatf-gafi.org/media/fatf/documents/Professional-Money-Laundering.pdf>

⁸ Two digit ISO code

RESULTS – TRANSACTIONAL ANALYSIS

All Incoming and Outgoing Wire Analysis

From December 2016 through December 2019, *inbound* wires (*credits*) declined by 45% from \$84,218,642 to \$46,041,818, a decrease in incoming value of \$38,176,823.

The decrease in inbound wire value cannot entirely be explained by the increase in outbound wire value, known as balancing transaction allocation. The outbound value increase exceeded the inbound value decrease by \$173 million, nearly 5 times more than the incoming wires' decrease in value.

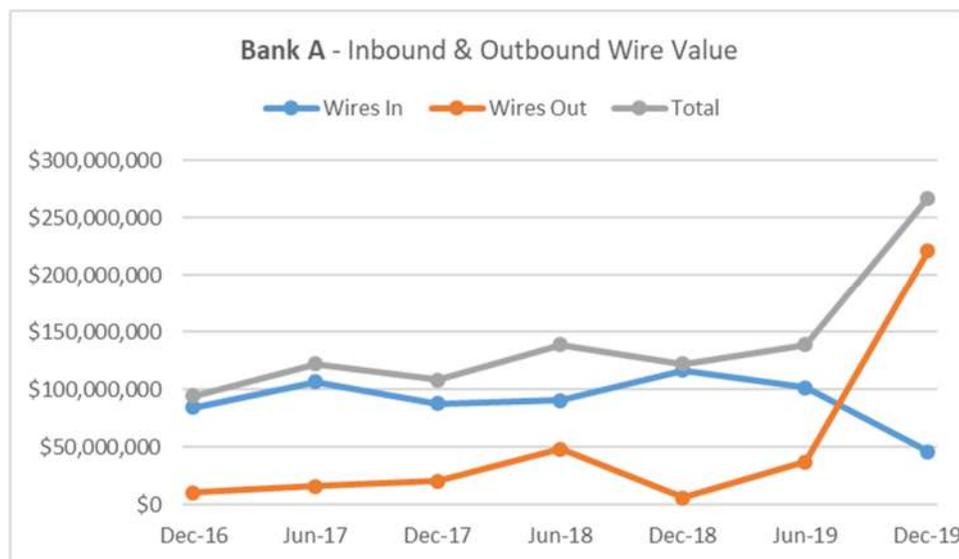
Incoming Wires

- Average inbound wire = \$137,833
 - Highest average monthly value = June 2019 - \$192,065
 - Lowest average monthly value = December 2019 - \$95,721
- Lowest monthly value = December 2019 - \$46,051,818
- Highest monthly value = December 2018 - \$116,441,126

During the same period of December 2016 through December 2019, *outbound* wires (*debits*) increased significantly from \$10,357,678 to \$221,361,304, a 2087% increase in outbound wire value.

Outgoing Wires

- Average outbound wire was \$263,619
 - Highest average monthly value = December 2016 - \$369,917
 - Lowest average monthly value = December 2018 - \$105,200
- Lowest monthly value = December 2016 - \$10,357,678
- Highest monthly value = December 2019 - \$221,361,304



Trading and Non-Trading Entities Analysis

During the review period from December 2016 through December 2019⁹, analysis of Bank A's trading and non-trading companies' customers transacting¹⁰ resulted in several observations:

TRADING COMPANIES - OBSERVATIONS

1. *Numbers of trading companies* transacting increased by 67%, most notably by 116% between June 2019 (69 companies) and December 2019 (149 companies).
2. *Trading companies' Incoming wire value* decreased by 71% from \$46,697,250 to \$13,505,814.
3. *Trading companies* received 42% fewer *inbound wires* (149 in December 2016 vs 86 in December 2019) at increasingly lower values.
4. *Trading companies outbound wire value* increased by 307% from \$10,233,983 (99% of all December 2016 wire value out) to \$41,669,972 (16% of all December 2019 wire value out); however, trading company wires as a component of all incoming and outgoing wires decreased markedly due to the rapid growth of Non Trading Company (NTCs) wires.
5. *Trading companies outbound wire volume* increased by 669% from 26 wires (4% of all December 2016 wire volume) to 200 wires (18% of all December 2019 wire volume).
6. *Trading companies' wires* did not exhibit a seasonality pattern across the three-year review.

NON-TRADING COMPANIES - OBSERVATIONS

7. *Numbers of Non Trading Companies (NTCs)* transacting increased 63% from 317 NTCs (December 2016) to 515 NTCs (December 2019).
8. *NTCs wire value* increased significantly by 152%, from \$84,218,642 (December 2016) to \$212,227,337 (December 2019). Outbound value increase began in June 2019.
9. *Inbound wire value to NTCs* declined by 13% from \$37,521,392 to \$32,536,005.
10. *NTCs inbound wire volume decreased* by 12% from 449 wires (December 2016) to 395 wires (December 2019)
11. *Outbound wires (debits) from NTCs* increased by 145170% from \$123,695 (December 2016) to \$179,691,332 (December 2019)

Conclusion:

- *Trading company* wire activity increased significantly in outbound wire value, while simultaneously decreasing by inbound wire value.

⁹ The seven six-month review periods included transactions in the months of December 2016, June 2017, December 2017, June 2018, December 2018, June 2019 and December 2019.

¹⁰ Transacting means sending and receiving wires, in other words total transactions. Throughout the report, if referring to incoming wires, the report will state receiving or sending wires when assessing an aspect of Bank A's position in the wire date.

- *Non Trading Companies (NTCs) outbound wire value* increased in an extreme manner from December 2016 to December 2019, particularly from June 2017, despite a slight decrease in December 2018. During the same period, *NTCs inbound wire value also increased* from December 2016 through June 2019, while inbound wire volume decreased. However, from June 2019 to December 2019, inbound wire value to NTCs fell more than 50%.

Trading vs Non Trading Companies – Transactional Highlights

From December 2016 through December 2019, *inbound wires (credits) to Trading Companies* declined from \$46,470,389 to \$13,505,814 (December 2019), a 71% decrease in incoming value of \$32,964,575.

In the same period, *inbound wires (credits) to Non Trading Companies* declined 14% from \$37,748,253 to \$32,536,005, a decrease in incoming value of \$5,212,248.

Incoming Wires - Trading and Non-Trading Companies

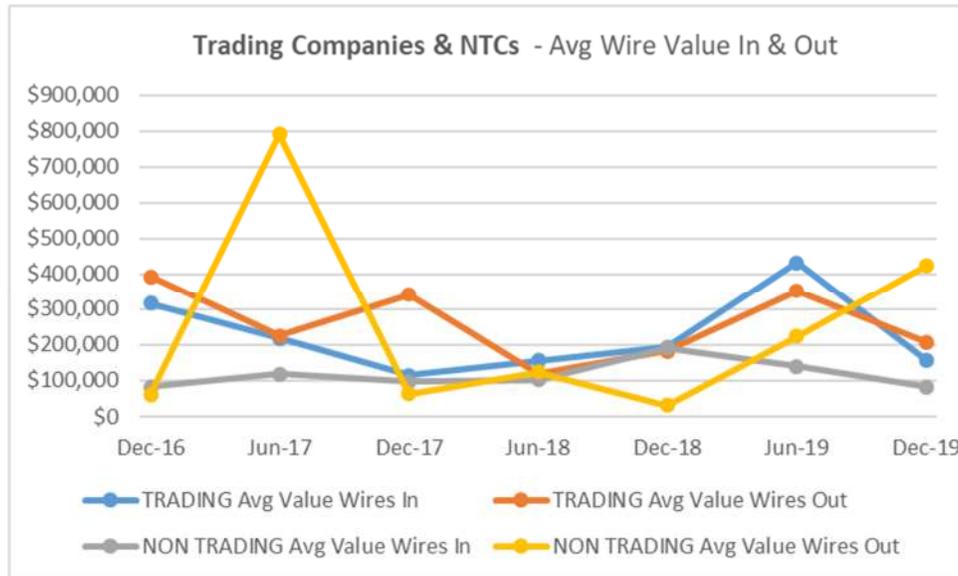
- Average inbound wire was \$211,917 (Trading Companies)
- Average inbound wire was \$116,584 (Non Trading Companies)
- *Highest* average monthly value =
 - \$432,854 in June 2019 (Trading Companies)
 - \$191,596 in December 2018 (Non Trading Companies)
- *Lowest* average monthly value =
 - \$114,361 in December 2017 (Trading Companies)
 - \$82,370 in December 2019 (Non Trading Companies)

Outbound wires (debits) from Trading Companies increased 307% from \$10,233, 983 (December 2016) to \$41,669,972 (December 2019), an increase in outbound value of \$31,435,989.

Outbound wires (debits) from Non Trading Companies increased 145170% from \$123,695 (December 2016) to \$179,691,332 (December 2019), an increase in outbound value of \$179,567,637.

Outgoing Wires - Trading and Non-Trading Companies

- Average outbound wire = \$210,571 (Trading Companies)
- Average outbound wire = \$304,949 (Non Trading Companies)
- *Highest* average monthly value =
 - \$393,615 in December 2016 (Trading Companies)
 - \$790,887 in June 2017 (Non Trading Companies)
- *Lowest* average monthly value =
 - \$120,592 in June 2018 (Trading Companies)
 - \$31,086 in December 2018 (Non Trading Companies)



TRADING COMPANIES

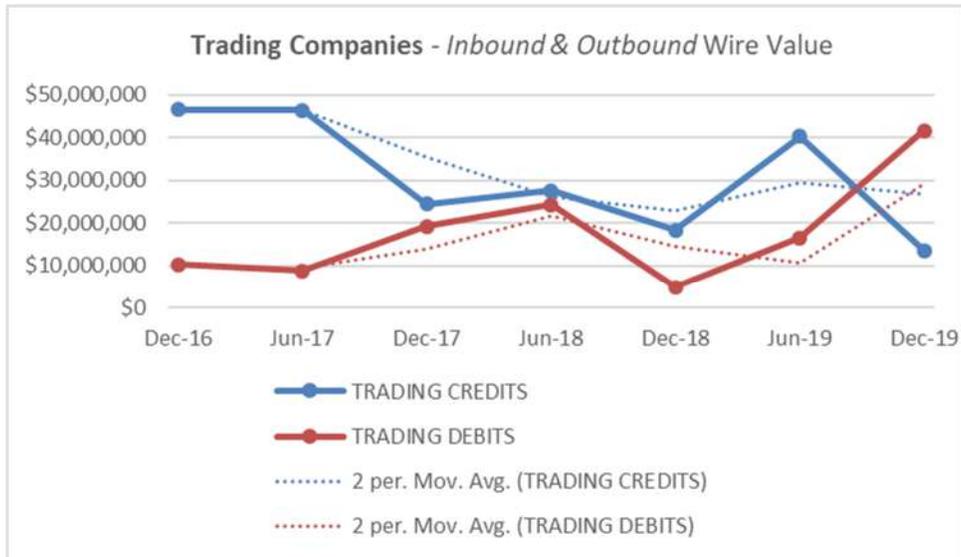
Actual number of trading companies transacting decreased by 21% from 189 companies (December 2016) to 149 trading companies (December 2019).

In terms of value, trading companies' wire value only decreased by 3%, from \$56,704,372 (December 2016) to \$55,175,786 (December 2019), indicating that fewer trading companies transacted at lower values and higher volumes.

- This observation was confirmed as trading companies' average wire value fell from \$327,771 (December 2016) to an average wire value of \$192,922 (December 2019).
- Trading companies' monthly wire volume rose from 173 wires (December 2016) to 286 wires (December 2019), a 65% volume increase.

Assessing changes in overall wire values offered some insights into trading companies' activity; however, considering inbound (debits) and outbound wires (credits) separately provided additional information into the transactional activity of Trading Companies during the review period.

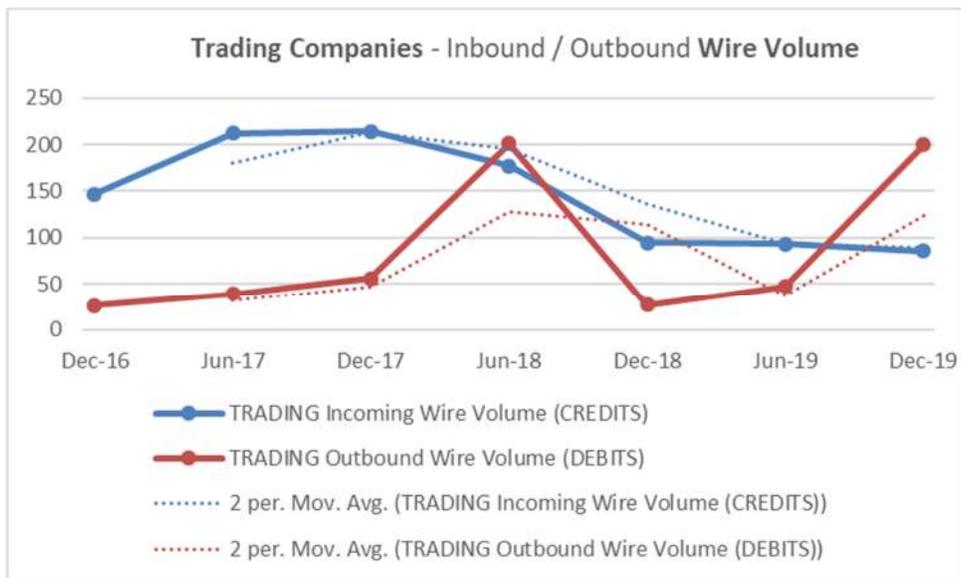
The chart below shows a much stronger downward trend in incoming wire value to beneficiary Trading Companies - \$46,470,389 (49% of all December 2016 incoming wire value) to \$13,505,814 (5% of all December 2019 inbound wire value), a material decrease of 71% by value.



The metrics in the subsequent charts reinforce that, in general, Trading Companies receiving incoming wires through Bank A’s account reduced the number of active beneficiary Trading Companies.

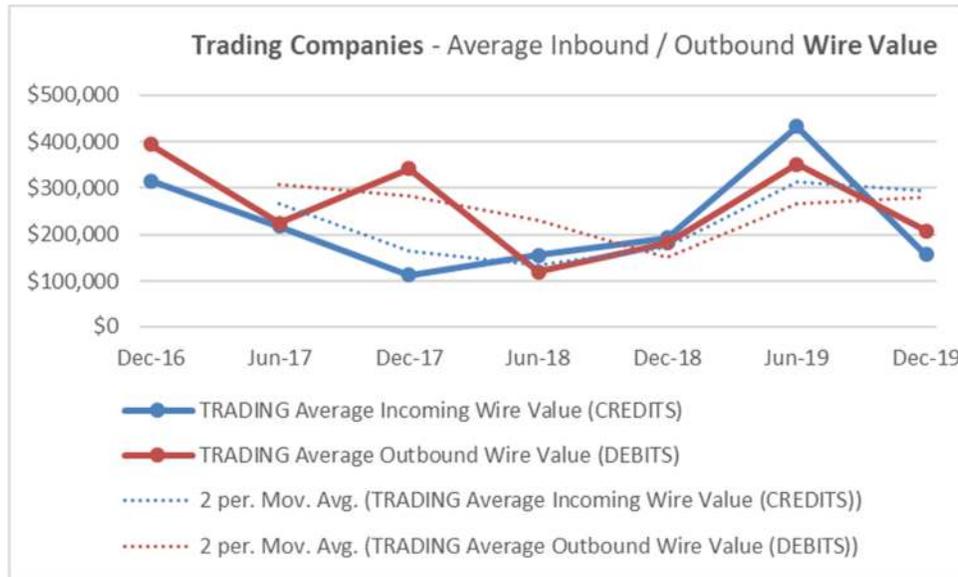
- During review period, Trading Companies began receiving 71% fewer inbound wires (147 in December 2016 vs 86 in December 2019) at increasingly lower values.

The chart below shows that Trading Companies’ *outbound wire value* exceeded Trading Companies’ *inbound wire value* in June 2018 and June 2019. Trading Companies’ *outbound wire value* increased by 307% from \$10,233,983 (99% of all December 2016 wire value out) to \$41,669,972 (16% of all December 2019 wire value out)



The chart below shows that Trading Companies’ average inbound and outbound wire value started declining after December 2017.

The chart also reflects that Trading companies' wires do not exhibit a seasonality pattern across the three-year review period. Value spikes observed in December 2016 and 2017; however, the only value spike observed since 2017 occurred in June 2019.

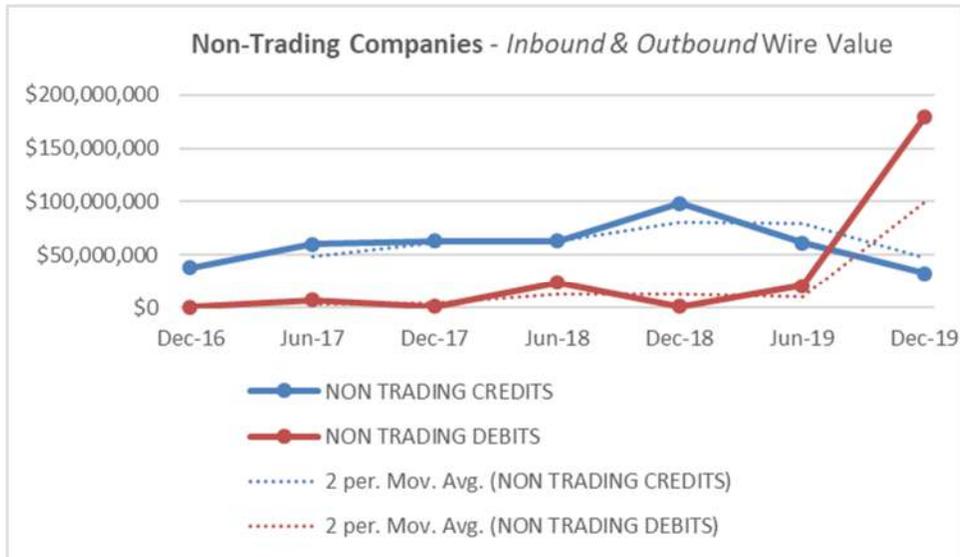


NON-TRADING COMPANIES

Actual number of Non Trading Companies (NTCs) transacting increased 63% from 317 NTCs (December 2016) to 516 NTCs (December 2019).

In terms of value, NTCs incoming wire value decreased by 14% from \$37,748,253 (December 2016) to \$32,536,005 (December 2019).

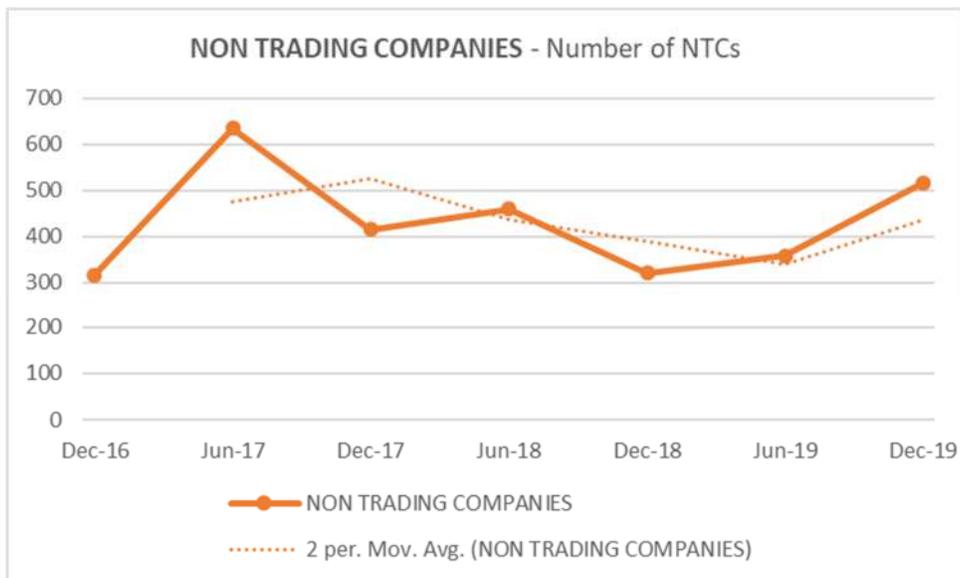
NTCs outbound wire value increased significantly by 145170% from \$123,695 (December 2016) to \$179,691,332 (December 2019). NTCs outbound value's sharp increase began in June 2019 as shown in the chart below.



This observation was confirmed as NTCs’ average wire value rose by 210% from \$83,603 (December 2016) to an average wire value of \$258,814 (December 2019). NTCs wire volume rose by 81% from 453 wires (December 2016) to 820 wires (December 2019)

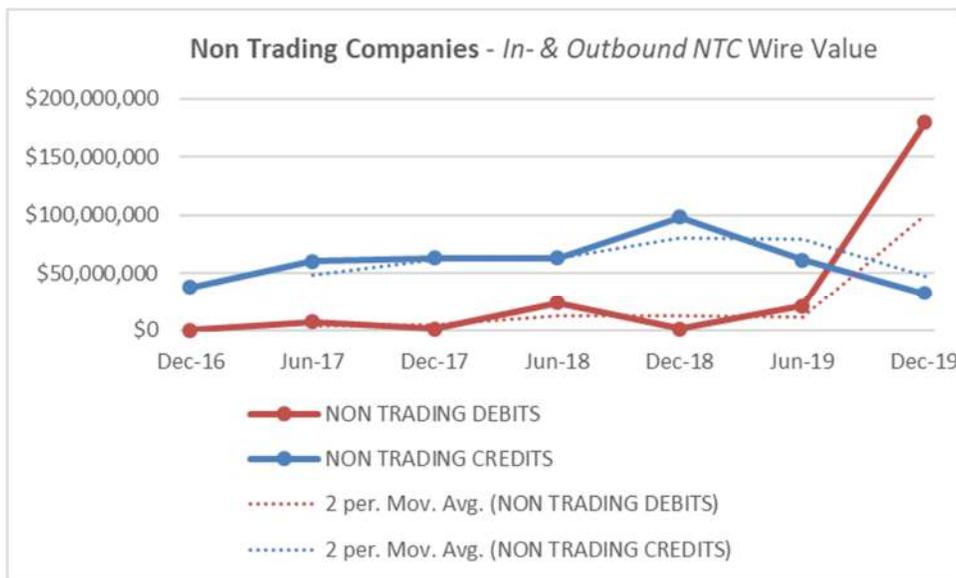
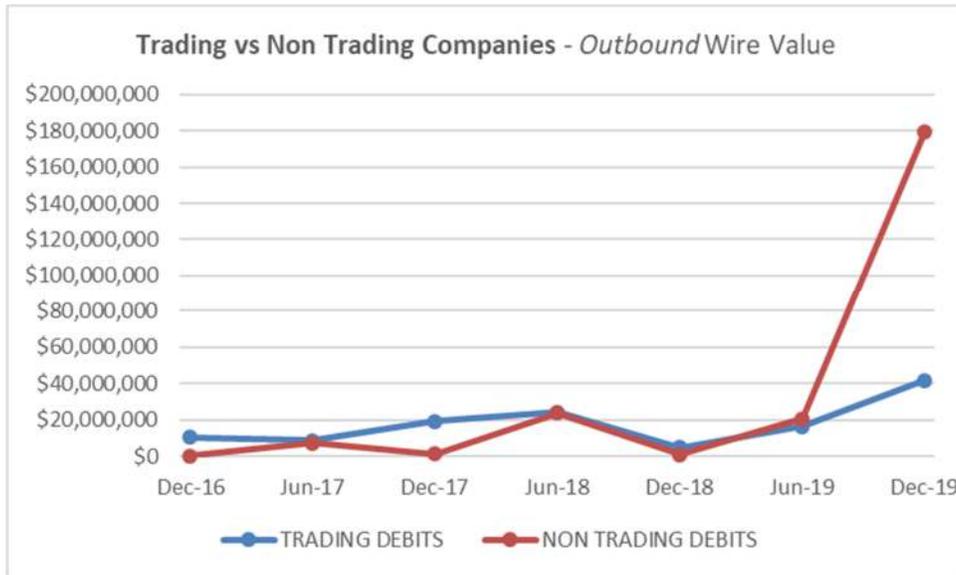
Assessing changes in NTCs’ overall wire values offered some clear insights into NTCs value and volume increases and the periods in which the value and volume changes occurred. However, the initial overall results highlighted the need for a deeper review of NTCs’ inbound (debits) and outbound wires (credits) to provide additional information into NTCs’ transactional activity.

NTCs increased in both the number of companies transacting and value transacted. Number of NTCs increased by 63% from 317 NTCs (December 2016) to 516 NTCs (December 2019).



NTCs incoming wire value (credits) decreased by 14% (\$5,212,248) from \$37,748,253 (40% of December 2016 incoming wire value) to \$32,536,005 (12% of December 2019 incoming wire value). Refer to the graph below.

NTCs outbound wire value increased by 145170% (\$179,567,637) from \$123,695 (December 2016) to \$179,691,332 (December 2019). The chart below indicates that the major increase in NTCs' outbound wire value started in December 2018 and continued through December 2019 in the same manner as the increase in the number of trading companies reflected.



COMPARING TRADING COMPANIES and NON-TRADING COMPANIES (NTCs)

The chart below compares the *number of trading companies and NTCs transacting* from December 2016 through December 2019. It shows the reduction and apparent stabilization in

the number of trading companies transacting during the review period, while highlighting the increase in NTC numbers during the same period.

Chart also shows a consistent increase in NTC numbers since December 2018, via the trend line.



Free Zone (FZ) and Onshore Entities Analysis

Several key features characterize Free Zone companies:

- They must be located in a free or economic zone;
- They must be owned by foreign nationals;
- Generally, they can only do business with other free zone companies or overseas entities.

Onshore Companies cannot be located in a free zone; must be majority-owned by a local person¹¹; and may comprise trading companies and non-trading companies.

FREE ZONE and TRADING COMPANIES - OBSERVATIONS

Analysis of Bank A's Free Zone and Onshore customers transacting reflected several features:

1. *Inbound wire value* received by FZ companies (credits) *decreased* by 25% from \$25,887,606 (December 2016) to \$19,416,163 (December 2019). The decrease began in June 2018.
2. From June 2017 to December 2019, *outbound wire value* sent by FZ companies increased by 121264% from \$28,216 (June 2017) to \$34,244,055 (December 2019). *Outgoing wire value* started to increase in December 2017.
3. *Inbound wire value* received by FZ Companies declined by 25% (\$6,498,651) from \$25,914,813 (December 2016) to \$19,416,163 (December 2019)

¹¹ Onshore Companies can also have minority ownership by one or more foreign nationals.

4. *Actual number of all FZ companies* transacting increased by 89% from 115 FZ companies (December 2016) to 214 FZ companies (December 2019).
5. *Numbers of Onshore and Free Zone companies* significantly increased from December 2016 to December 2019. .. Noting, *numbers of FZ companies receiving inbound wires* remained stable at 115 FZ companies between December 2016 and December 2019, reaching a high of 163 beneficiary FZ companies in December 2017.
6. *Number of originator FZ companies sending wires* increased from 0 (December 2016) to 99 (December 2019).
7. *Number of Onshore companies* materially increased by 52% from 298 entities (December 2016) to 452 entities (December 2019).
8. *Onshore companies inbound wire value* decreased by 54% (\$31,678,173) from \$58,303,828 (December 2016) to \$26,625,655 (December 2019)
9. *Onshore companies outbound wire value* increased in an extreme manner by 1707% (\$176,749,571 from \$10,357,678 (December 2016) to \$187,117,249 (December 2019).

Conclusion:

- *Both onshore companies and free zone (FZ) companies* wire activity increased. Most significantly in outbound wire value, while simultaneously decreasing receipt of inbound wire value.
- The numbers of Onshore and FZ companies transacting also increased significantly across the review periods.
- The increases in wire value transacted by Onshore and FZ companies by themselves are indicative in a shift in Bank A’s customers’ usage of its account. However, only by examining the activity of trading companies and non-trading companies in both free zones and onshore, can we determine whether in fact a significant change in behavioral activity has taken place.

FREE ZONE COMPANIES – Transactional Value

In terms of value, FZ companies’ overall wire value¹² increased by 107%, from \$25,887,606 (December 2016) to \$53,660,218 (December 2019).

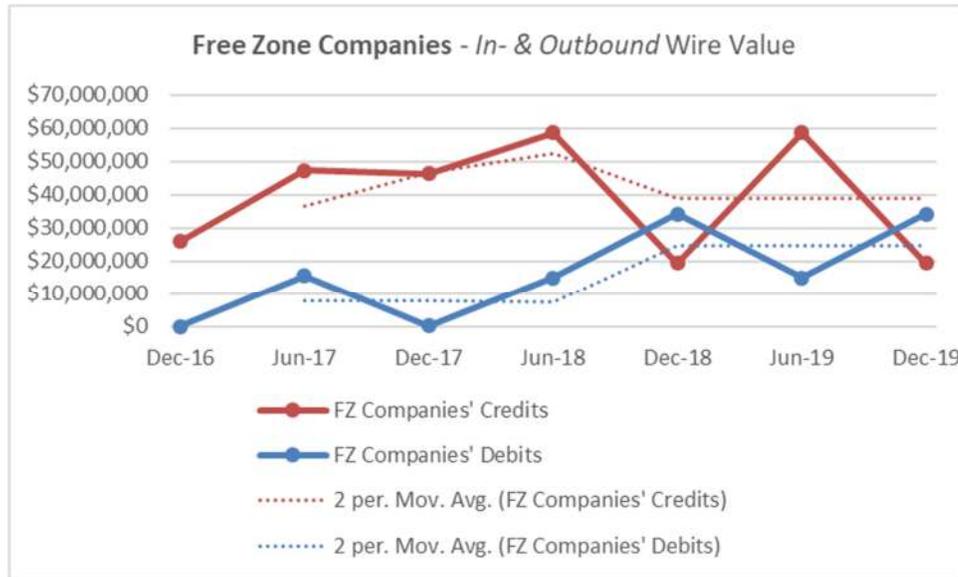
The chart below shows FZ companies’ inbound and outbound wires value separately by debits and credits over the seven periods reviewed.

Inbound wire value received by FZ companies (credits) *decreased* by 25% from \$25,887,606 (December 2016) to \$19,416,163 (December 2019). The 2-period moving average indicated the

¹² Both outgoing debits and incoming credits.

decrease began in June 2018 and stabilized in December 2018, despite wide fluctuations in value since December 2017.

Outbound wire value sent by FZ companies (debits) *increased* dramatically from \$0 (December 2016) to \$34,244,055 (December 2019). From June 2017 to December 2019, *outbound wire value* increased by 121264% from \$28,216 (June 2017) to \$34,244,055 (December 2019). Similar to incoming wires, the 2-period moving average indicated that *outgoing wire value* started to increase in December 2017 and the trend stabilized by December 2018.



FREE ZONE COMPANIES – Number of FZ Companies

We considered whether the number of FZ companies transacting through Bank A's account reflected a trend similar to that of the wire values. That is, whether an increase or decrease occurred in the number FZ companies after the initial December 2016 period.

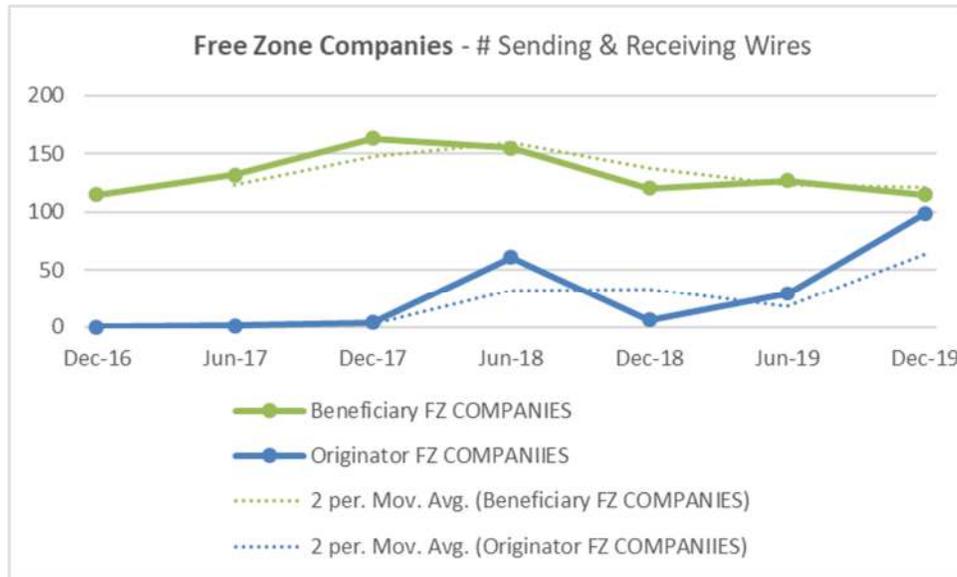
The actual number of FZ companies transacting increased by 89% from 115 FZ companies (December 2016) to 214 FZ companies (December 2019). However, combining incoming and outgoing FZ companies transacting could conceal an observable trend in either the number of FZ originators and/or FZ beneficiaries.

The "Free Zone Companies - # Sending & Receiving Wires" chart below reflects FZ companies' incoming and outgoing wires separately.

Chart shows that the number of beneficiary FZ companies *receiving* wires (credits) remained relatively stable from 115 (December 2016) to 115 (December 2019) with a spike to 163 FZ companies receiving incoming wires in December 2017.

- As indicated in the FZ Companies Transaction section, wire value received by beneficiary FZ companies decreased by 25% from December 2016 to December 2019, while the numbers of FZ companies receiving wires remained relatively stable.

The number of originator FZ companies sending wires (debits) increased from 0 (December 2016) to 99 in (December 2019) with a 100% spike between December 2017 (6 FZ companies) and June 2018 (61 FZ companies).



- As indicated in the FZ Companies Transaction section, the wire value sent by FZ originator companies increased by 107% from December 2016 to December 2019 while the number of originator FZ companies sending wires increased by 100%.

FREE ZONE COMPANIES – Intersection of Trading and Non-Trading Companies

Free Zone (FZ) companies also comprise trading companies and non-trading companies (NTCs).

Wire Summary – FZ Trading and FZ Non Trading Companies

- Average wire value =
 - \$57,460 (FZ Trading Companies)
 - \$53,897 (FZ Non Trading Companies)
- Highest* average monthly value =
 - \$90,154 in June 2019 (FZ Trading Companies)
 - \$185,888 in June 2019 (FZ Non Trading Companies)
- Lowest* average monthly value =
 - \$9,459 in December 2017 (FZ Trading Companies)
 - \$26,395 in December 2016 (FZ Non Trading Companies)

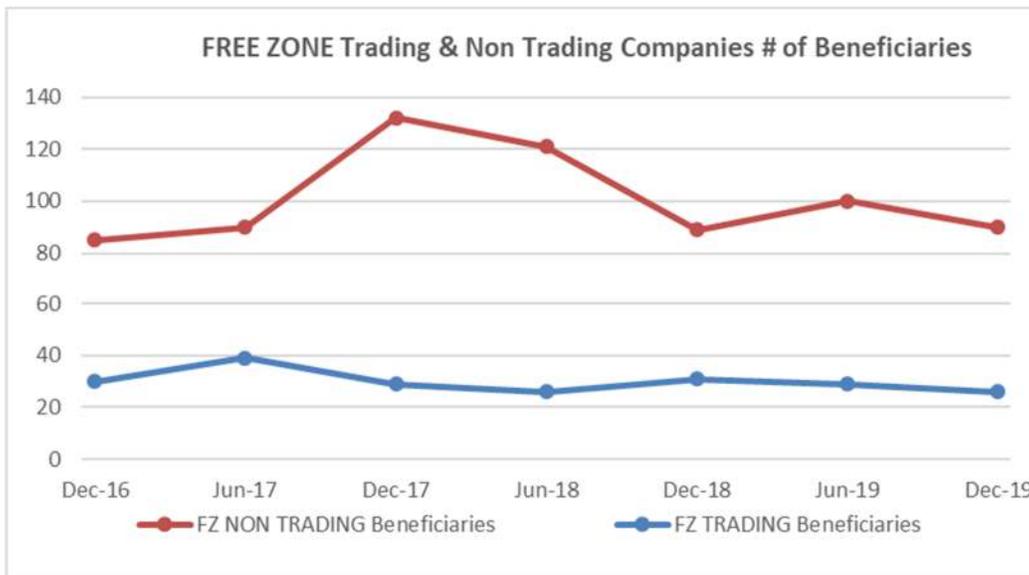
During the review period, *overall wire value* by FZ Trading Companies increased from \$10,130,629 (December 2016) to \$23,406,393 (December 2019), a 131% increase in value.

Overall wire value by FZ Non Trading Companies increased from \$15,784,184 (December 2016) to \$30,253,825 (December 2019), a 240% increase in value.

Chart below shows that *Free Zone NTCs* began transacting at much higher values than Free Zone Trading companies, beginning in December 2017.



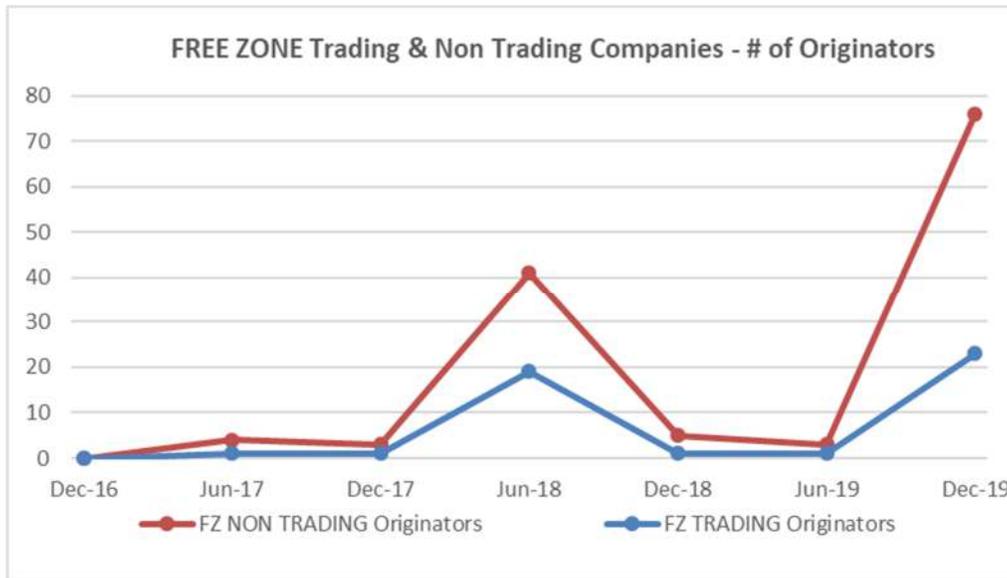
Free Zone Trading and Non Trading companies as Beneficiaries of incoming wire value. More NTCs in Free Zones received wires than FZ Trading companies. Greater numbers of FZ NTCs began receiving incoming wires starting after June 2017; however, this trend reverted to a narrow range of FZ beneficiaries (particularly FZ NTCs) in December 2018.



Free Zone Trading and Non Trading companies as Originators of outgoing wire value showed that more NTCs in Free Zones sent out wires than FZ Trading companies. Unlike the incoming

wires, more FZ NTCs began sending wires through Bank A's account beginning in December 2017, shown in the chart below.

This chart also reflects that the significant increase in outbound wire value across Bank A's customers was driven primarily by Onshore Non Trading Companies (NTCs)



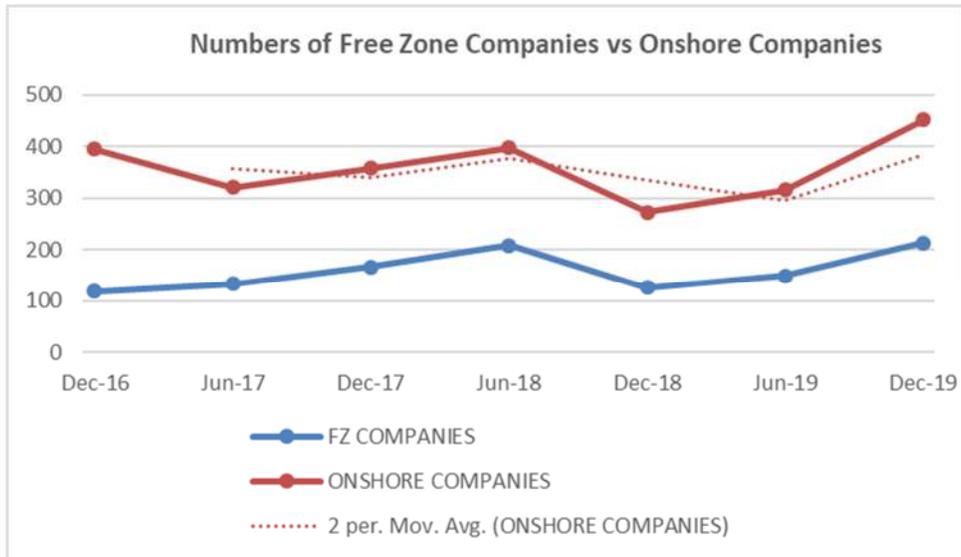
ONSHORE COMPANIES – Transactional Value

ONSHORE COMPANIES – Number of Onshore Companies

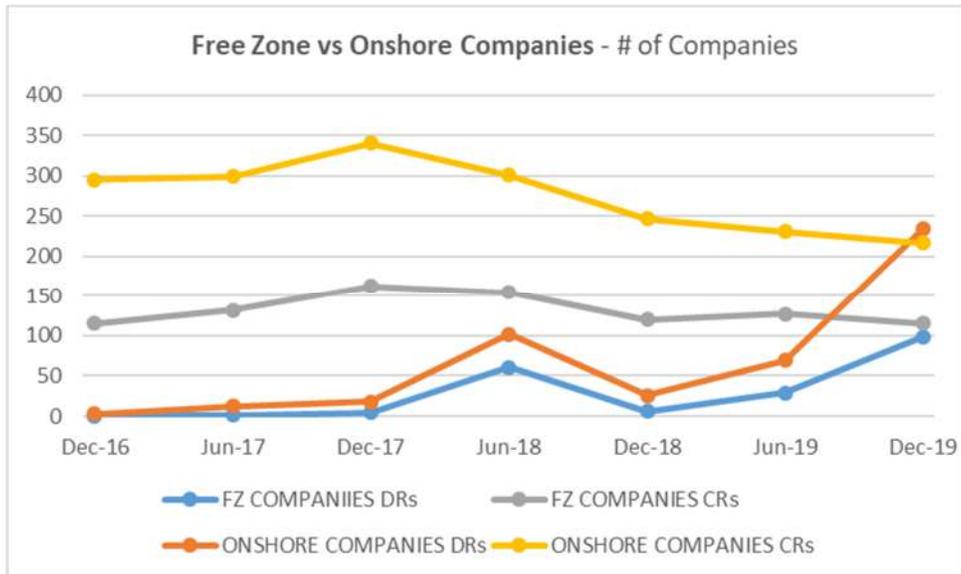
We considered whether the number of Onshore companies transacting through Bank A's account reflected a trend similar to that of the wire values. That is, whether an increase or decrease occurred in the number of Onshore companies after the initial December 2016 period.

The chart below compares the numbers of FZ versus Onshore companies over the seven periods reviewed. The chart indicates clearly that the numbers of Onshore companies increased more significantly than FZ companies.

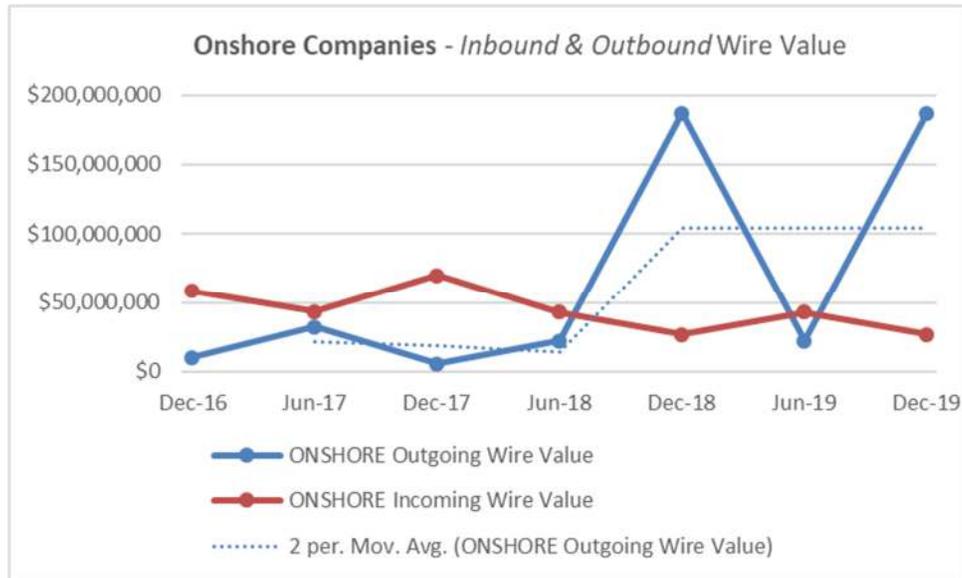
- The numbers of *Onshore companies receiving wires* (credits) declined by 26% from 295 (December 2016) to 217 (December 2019).
- The numbers of *Onshore companies sending wires* (debits) increased by 7733% from 3 onshore companies (December 2016) to 235 onshore companies (December 2019)



In this chart, we observe that the numbers of beneficiary FZ companies and beneficiary Onshore companies receiving incoming wires continued to decrease from December 2016 to December 2019. However, FZ and Onshore companies' outbound activity significantly increased starting in June 2018.



As the chart below indicates, Onshore companies demonstrated wide value fluctuations in outgoing wires beginning in June 2018 and continuing across the subsequent periods reviewed.



ONSHORE TRADING and NON-TRADING COMPANIES – Transactional Value

Onshore activity comprised Trading and Non Trading companies. Analysis of Bank A’s Onshore customer types by the number of trading and non-trading entities transacting reflected several key facts:

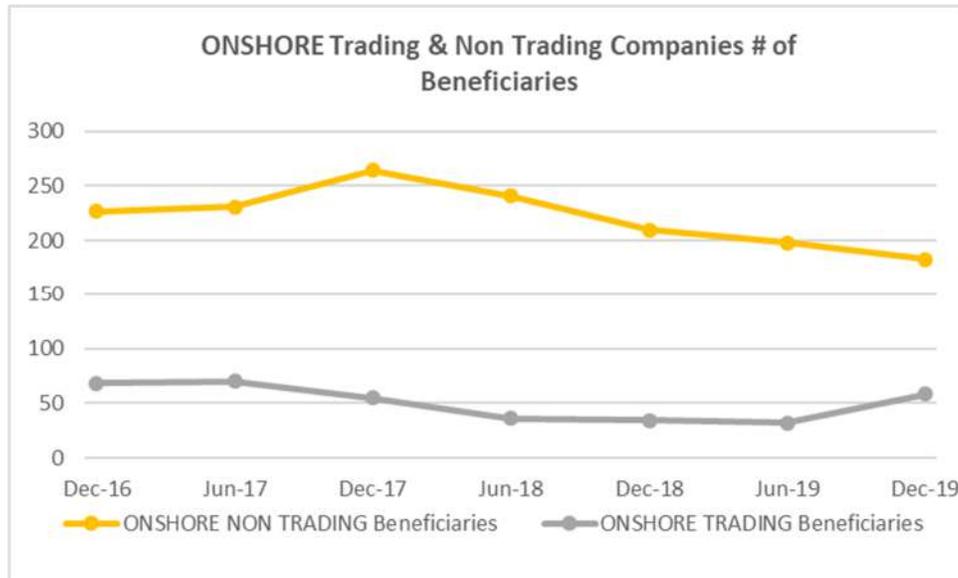
1. The number of Onshore and Free Zone companies transacting significantly increased from December 2016 to December 2019.
2. The *number of Onshore companies* transacting materially increased, as did the wire value transacted, mainly in outbound wires (debits).

Onshore Companies - the numbers of these companies and their incoming and outgoing wire values were assessed to determine if commonalities in transactional activity or patterns could be established.

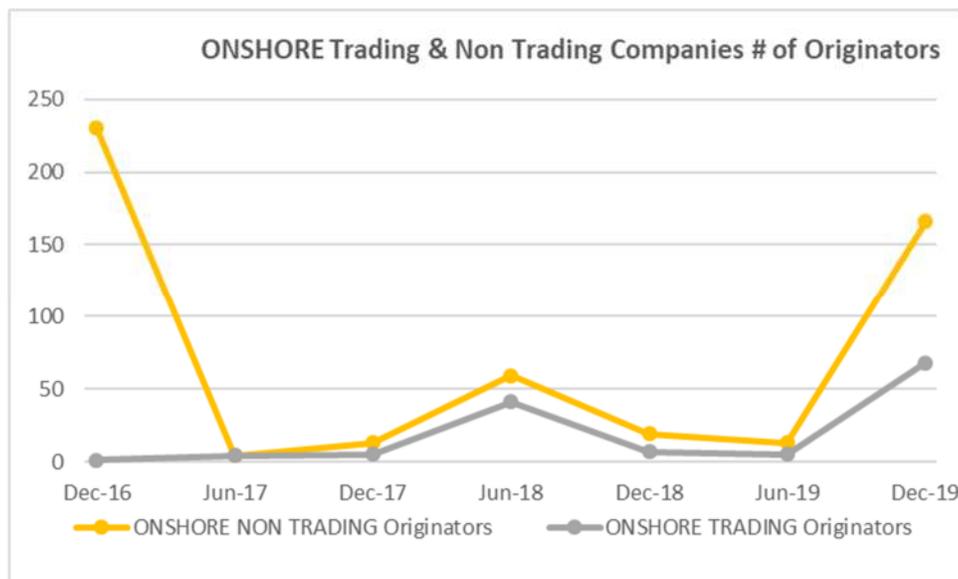
Wire Summary – Onshore Trading and Onshore Non Trading Companies

- Average wire value = \$125,694
 - \$206,210 (Onshore Trading Companies)
 - \$158,314 (Onshore Non Trading Companies)
- *Highest* average monthly value =
 - \$396,808 in June 2019 (Onshore Trading Companies)
 - \$348,608 in December 2019 (Onshore Non Trading Companies)
- *Lowest* average monthly value =
 - \$131,059 in June 2018 (Onshore Trading Companies)
 - \$71,481 in December 2016 (Onshore Non Trading Companies)

We identified both Onshore trading companies and NTCs in the dataset. The graph below reflects that the number of beneficiary Onshore Trading companies and NTCs declined since June 2019, with a slight uptick in Onshore Trading Companies in December 2019.



However, originator Onshore trading and NTCs reflected wide fluctuations in their number in each period, particularly the Onshore NTCs. Onshore NTCs numbers decreased sharply from December 2016 to June 2017. Notwithstanding the decrease in Onshore NTCs, their wire value sent out increased from \$21,737,207 (December 2016) to \$36,104,485 (June 2017), an increase in value of \$14,367,278 or 66% between the 2 periods.



Onshore Trading and Non-Trading Companies (NTCs) – Transactional Details

SUMMARY

In December 2016, *Onshore trading companies' outgoing wire value* (\$10,233,983) accounted for 99% of all wire value and NTC's outgoing wire value (\$123,695) accounted for less than 1% of all wire value (\$10,357,678).

- By December 2019, *Onshore trading companies' outgoing wire value* (\$25,720,375) accounted for 12% of all wire value and NTCs wire value (\$161,396,874) comprised 73% of all wire value (\$221,361,304)
- *Onshore trading companies outgoing wire value* increased by 151%
- NTC's outgoing wire value increased by an exponential 130380%

This significant change – higher value transacted by NTCs in Onshore locations – began in June 2017. The behavioral shift from Onshore trading companies to Onshore NTCs suggests that onshore trading companies may have begun to change their business registration to NTCs, possibly in response to heightened awareness generated via FATF's 2018 Professional Money Launderer publication. By December 2019, *onshore trading* companies received significantly lower value (53% less) of the total Onshore incoming and outgoing wire value, as reflected in the chart below.



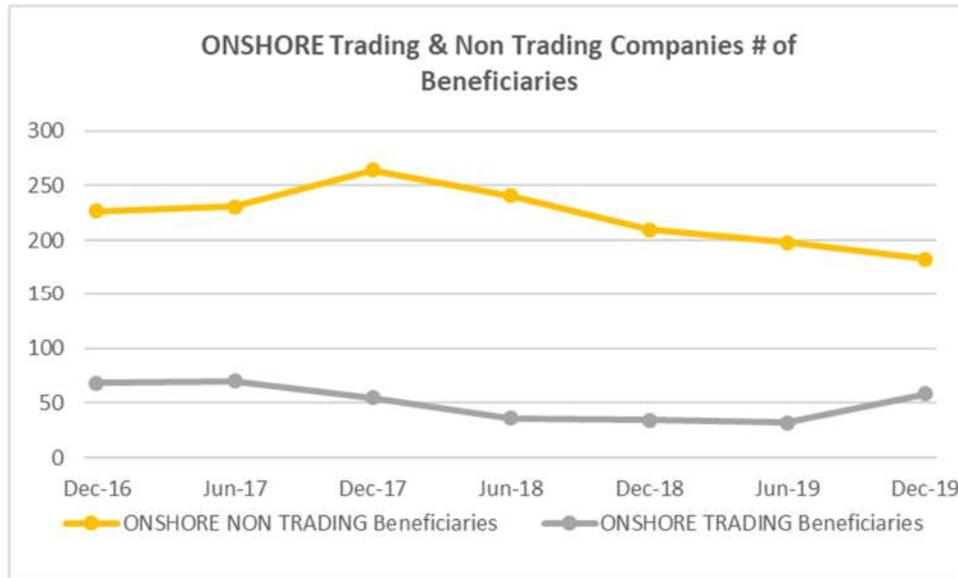
- In December 2016, Onshore companies' incoming wires in December 2016 comprised 43% trading companies (\$46,566,621) and 26% non-trading companies (\$21,737,207) by value
- In December 2019, Onshore companies' incoming wires comprised 13% trading companies (\$5,857,749) and 45% non-trading companies (\$20,567,942) by value.

This change, which was observed in June 2017, indicates that more non-trading companies with onshore registrations began receiving incoming wires. By December 2019, *onshore trading* companies received significantly lower value (53% less) of the total Onshore incoming and outgoing wire value, as reflected in the table below.



To further isolate the potential trend of Onshore Non Trading Companies changing behavior, the review compared Onshore companies as beneficiaries of incoming wires versus Onshore companies as wire originators.

With incoming wires, beneficiary Onshore NTCs consistently reflected higher numbers than the number of Onshore Trading companies. However, no significant changes were observed since the numbers of both Onshore NTCs and Onshore Trading companies as wire beneficiaries appeared stable within a narrow band.

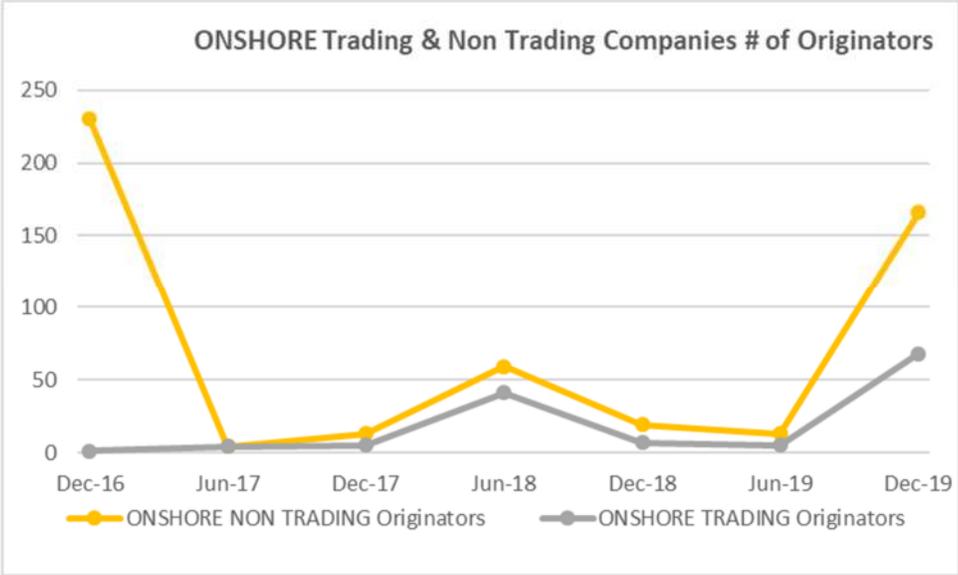


In December 2016, *Onshore companies' outbound wires* comprised 99% onshore trading companies (\$10,233,983) and less than 1% non-trading companies (\$123,695) by value

By December 2019, *Onshore companies' outbound wires* comprised 12% onshore trading companies (\$25,720,375) and 73% non-trading companies (\$161,396,874) by value.

- *Onshore trading companies outgoing wire* value increased by 151%
- NTC's outgoing wire value increased by an exponential 130380%

The chart below compares Onshore NTCs and Trading companies as originators of outbound wires. On two occasions (December 2016 and December 2019), the number of Onshore NTCs sending wires significantly exceeded the number of Onshore Trading companies sending wires. However, the data appears inconclusive since from June 2017 to June 2019, a very low number of Onshore NTCs and Trading companies sent out wires via Bank A's account.



RESULTS – COUNTER PARTY GEOGRAPHY ANALYSIS

In total, we assessed seven monthly data periods in six-month intervals from December 2016 through December 2019. The seven monthly periods returned an initial dataset of 8,726 incoming and outgoing, third party commercial payments valued at \$997,293,536.

- After developing the initial dataset, we excluded all Bank-to-Bank wires¹³ and third party wires valued below \$5,000¹⁴.

Following removal of Bank-to-Bank and third party wires below \$5,000, the final dataset contained 5,955 wires (\$991,994,462).

Counterparty geographies include countries to which wires were sent or from which wires were received by Bank A's customers.

- For Bank A customers sending outgoing wires (debits), we assessed the wire beneficiaries' countries of location as provided in the wire data as "**counterparty beneficiary geographies.**"
- For Bank A customers receiving incoming wires (credits), we assessed the wire originators' countries of location found in the wire data as "**counterparty originator geographies.**"

Across the seven data periods, we evaluated the top 6 counterparty geographies (by wire value) by counterparty originator and counterparty beneficiary geography (abbreviated as "geo").

In addition, we considered the distribution of the top six geographies by trading companies; non-trading companies; free zone and onshore companies by the highest wire value per counterparty country.

During the review period, wires took place with more than 140 distinct countries.

- Incoming wires to Bank A's beneficiary customers originated in 134 countries, led by Singapore, Netherlands, UAE, US, Azerbaijan, Bulgaria and Malta.
- Outgoing wires from Bank A's originator customers went to 80 countries, led by the US, China, India, Indonesia, Hong Kong, Singapore, and Canada.

BENEFICIARY COUNTERPARTY COUNTRIES - DETAILS

The chart below summarizes the top countries (by highest value) to which Bank A's customers sent wires.

Aside from establishing that two counterparty countries received wires in all or nearly all periods (US and UAE), a change in counterparty countries appeared in June 2018 with the addition of India and Trinidad as beneficiary countries and a higher value sent to the US.

Another change appeared in June 2019 with the addition of Turkmenistan, Singapore, UK and Mauritius as beneficiary counterparties, replacing India and Trinidad.

¹³ Bank to bank wires contained SWIFT codes CHI31, certain CHO10s, FWI10, FWO10, SWI202 and SWI202 where banks were found in the originator and beneficiary name fields.

¹⁴ These transactions mainly reflected very low value incoming and outgoing wires by individuals.

This change of beneficiary counterparty countries could indicate a non-repetitive, activity burst occurred in June 2018. Alternatively, Bank A may have on-boarded new customers with suppliers from new countries or that Bank A's existing customers began working with new suppliers.

The fact that neither India nor Trinidad re-entered the top beneficiary geographies list and that high wire value was sent to each country suggests a possible activity burst to move value to these countries.

In a similar vein, replacement of India and Trinidad (\$30MM sent) by four new beneficiary countries in June 2019 (\$17.1MM sent), none of which received high value in subsequent periods, more strongly supports a behavioral change that may not be a random occurrence.

Finally, in December 2019, no high value transactions took place with Turkmenistan, Singapore, UK or Mauritius. In this period, three new beneficiary countries were noted – Jordan, Ukraine and Korea (\$35.8MM sent).

TOP BENEFICIARY COUNTERPARTY COUNTRIES (Countries to which Bank's Customers Sent Wires)									
GEO	2016		2017		2018		2019		Total
	Dec	June	Dec	June	Dec	June	Dec		
AE	\$70,095			\$320,385		\$3,831,219	\$111,984,482	\$116,206,181	
US	\$10,233,983	\$8,585,716	\$10,988,826	\$17,452,744	\$5,398,172	\$7,694,344	\$12,089,396	\$72,443,181	
CH		\$7,000,000					\$25,501,627	\$32,501,627	
IN				\$26,892,700	\$58,241			\$26,950,941	
JO							\$17,355,555	\$17,355,555	
UA							\$10,049,807	\$10,049,807	
KR							\$8,417,853	\$8,417,853	
TM						\$7,500,000		\$7,500,000	
SG					\$62,000	\$4,445,030		\$4,507,030	
GB						\$3,688,431		\$3,688,431	
TT				\$3,146,575				\$3,146,575	
MU						\$1,500,000		\$1,500,000	
CN		\$166,245	\$30,000	\$102,406				\$298,651	
ID			\$38,745	\$98,000	\$79,860			\$216,605	
NL					\$166,475			\$166,475	
HK		\$127,859	\$32,180					\$160,039	
PK			\$95,000					\$95,000	
UY	\$53,600							\$53,600	
SC			\$29,160					\$29,160	
CA					\$8,761			\$8,761	
Total	\$10,357,678	\$15,879,820	\$11,213,911	\$48,012,810	\$5,773,509	\$28,659,024	\$185,398,720	\$305,295,472	

ORIGINATOR COUNTERPARTY COUNTRIES - DETAILS

This next chart reflects originators' counterparty countries sending funds to Bank A's customers. These would represent incoming wires (credits) to the bank's customers.

We observe a relatively consistent pattern of receiving funds from 10 countries (four or more instances of the country placing in the top country list (by value).

Change occurred in June 2019 where Turkey and Kuwait stopped sending wires; Taiwan sent 700% more value than in the December 2017 period, and Bulgaria began sending non-recurring wires.

In December 2019, another counterparty geography shift occurred where high value wires from Hong Kong and Taiwan ceased; wires from Korea increase in value by 352%; and

TOP ORIGINATOR COUNTERPARTY COUNTRIES (Countries from which Bank A's Customers Received Wires)									
GEO	Year / Month		2017		2018		2019		Total
	2016	2017	2017	2018	2019	2019	2019		
	Dec	June	Dec	June	Dec	June	Dec		
AE	\$13,724,579		\$20,272,915	\$16,806,246	\$14,964,096	\$17,185,315	\$3,456,439	\$86,409,590	
US	\$5,962,554	\$8,585,716	\$6,222,911	\$5,932,952	\$32,248,567	\$4,696,689	\$3,911,048	\$67,560,437	
SG	\$28,619,003			\$8,165,062	\$3,855,671	\$13,540,427	\$3,937,352	\$58,117,515	
HK		\$127,859		\$12,897,197	\$9,319,810	\$13,600,465		\$35,945,331	
SA	\$1,991,442		\$9,821,095	\$5,586,805	\$7,874,737	\$2,298,481	\$1,569,538	\$29,142,097	
TW				\$2,149,682	\$3,494,918	\$22,803,810		\$28,448,410	
TR	\$5,544,380		\$7,659,099		\$2,023,745			\$15,227,224	
KW	\$3,561,760		\$2,966,820		\$5,616,149			\$12,144,729	
KR	\$2,144,748				\$1,797,364	\$1,448,172	\$6,540,840	\$11,931,125	
EG				\$2,872,905	\$4,724,538	\$1,290,386	\$2,530,853	\$11,418,683	
CH		\$7,000,000		\$4,059,910				\$11,059,910	
NL					\$6,578,993			\$6,578,993	
WS	\$2,034,814		\$3,170,636					\$5,205,449	
IN			\$2,070,224			\$1,174,135	\$1,544,383	\$4,788,742	
CN	\$4,355,280	\$166,245						\$4,521,525	
SC			\$3,977,839					\$3,977,839	
OM			\$3,125,555					\$3,125,555	
TN				\$2,249,875				\$2,249,875	
BG						\$1,166,151		\$1,166,151	
KG							\$1,136,714	\$1,136,714	
JO							\$1,132,628	\$1,132,628	
Total	\$67,938,560	\$15,879,820	\$59,287,093	\$60,720,632	\$92,498,590	\$79,204,032	\$25,759,795	\$401,288,522	

Jordan and Kyrgyzstan sent wires to Bank A's customers, having not previously sent high value wires.

TRADING COMPANIES - ORIGINATOR COUNTERPARTY COUNTRIES – DETAILS

Trading companies wires reflect different beneficiary and originator counterparty countries from the overall wires shown in the two preceding charts.

TRADING COMPANIES – OUTGOING WIRES’ BENEFICIARY COUNTERPARTY COUNTRIES							
GEO	Year / Month		2018		2019		Total
	2017		June	Dec	June	Dec	
	June	Dec					
US	\$3,542,120	\$19,054,250	\$15,690,618	\$4,694,666	\$6,498,103	\$9,012,317	\$58,492,074
AE	\$11,230,362					\$6,545,196	\$17,775,558
IN	\$2,075,684	\$15,647	\$8,435,753	\$46,969	\$228,020		\$10,802,073
UA						\$10,029,807	\$10,029,807
TR	\$8,304,744				\$402,328		\$8,707,072
KR					\$400,000	\$8,196,143	\$8,596,143
TM					\$7,500,000		\$7,500,000
TH	\$6,097,880						\$6,097,880
SG	\$3,187,165						\$3,187,165
CN			\$102,406	\$7,500		\$1,827,037	\$1,936,943
MX						\$785,000	\$785,000
RU					\$590,000		\$590,000
NL				\$166,475			\$166,475
HK		\$32,180					\$32,180
SC		\$29,160					\$29,160
MY			\$10,150				\$10,150
Total	\$34,437,955	\$19,131,237	\$24,238,927	\$4,915,609	\$15,618,451	\$36,395,500	\$134,737,680

FREE ZONE TRADING and NON-TRADING COMPANIES – TOP COUNTERPARTY GEOGRAPHIES

The previous tables reflect top beneficiary and originator counterparty countries across all transactions during the review period. Taken alone, they provide some possible indicia of certain periods when changes in transactional geographies may have occurred.

To determine which of Bank A’s customer types may have changed behavior or caused a change in counterparty countries, we explored potential geographic impacts by the four customer types used during the transactional review: Trading Companies, Non-Trading Companies, Free Zone customers and Onshore customers.

Free Zone (FZ) NON TRADING COMPANIES (NTCs) – Counterparty Geographies

From December 2016 through December 2019, FZ NTCs completely changed the countries from which they *received incoming wires*.

- In period 1 (December 2016), FZ NTCs *received* the bulk of their incoming wires from 4 countries – Kuwait, Singapore, the US and Western Samoa.
- In period 7 (December 2019), FZ NTCs *received* the highest value of their incoming wires from 5 originator counterparty countries – US, Kyrgyzstan, Korea, Sri Lanka and Turkey.

FZ NON TRADING (NTCs) - ORIGINATOR COUNTERPARTY COUNTRIES					
PERIOD 1 (12/16)	GEO	VALUE	PERIOD 7 (12/19)	GEO	VALUE
Dec-16	KW	\$3,561,760	Dec-19	US	\$1,652,599

Dec-16	SG	\$2,385,816	Dec-19	KG	\$1,074,344
Dec-16	US	\$2,600,246	Dec-19	KR	\$1,019,874
Dec-16	WS	\$2,034,814	Dec-19	LK	\$903,327
			Dec-19	TR	\$754,093

From December 2016 through December 2019, *FZ NTCs* completely changed the countries to which they *sent outgoing wires*.

- In period 1 (December 2016), *FZ NTCs sent all outgoing wires* to one country – the US.
- In period 7 (December 2019), *FZ NTCs sent the highest value of their outgoing wires* to 5 beneficiary counterparty countries – the UAE, Turkey, Switzerland, Georgia, and Japan.
- Data reflects that *FZ NTCs* maintained the same counterparties from December 2016 through December 2018. *FZ NTCs* began changing beneficiary counterparty countries in June 2018 to higher risk countries such as Egypt and Jordan.

FZ NON TRADING (NTCs) - BENEFICIARY COUNTERPARTY COUNTRIES					
PERIOD 1 (12/16)	GEO	VALUE	PERIOD 7 (12/19)	GEO	VALUE
Jun-17	US	\$82,563	Dec-19	AE	\$3,920,773
			Dec-19	TR	\$3,391,856
			Dec-19	CH	\$2,282,118
			Dec-19	GE	\$1,324,197
			Dec-19	JP	\$1,283,396

FZ TRADING COMPANIES – Counterparty Geographies

From December 2016 through December 2019, *FZ Trading Companies* significantly changed four of the top five countries from which they *received incoming wires*.

- In period 1 (December 2016), *FZ Trading Companies* received the bulk of their incoming wires from 5 countries – China, Turkey, US, Egypt and the UAE.
- In period 7 (December 2019), *FZ Trading Companies* received the highest value of their incoming wires from 5 originator counterparty countries – Singapore, Saudi Arabia, Jordan, Egypt and Greece.
- Data reflects that *FZ Trading Companies* began changing originator counterparty countries of highest incoming wire value in June 2017 to higher risk countries such as Jordan, Marshall Islands, Djibouti, Indonesia, Mexico and Tunisia.

FZ TRADING COMPANIES - ORIGINATOR COUNTERPARTY COUNTRIES					
PERIOD 1 (12/16)	GEO	VALUE	PERIOD 7 (12/19)	GEO	VALUE
Dec-16	CN	\$4,255,980	Dec-19	SG	\$2,005,708
Dec-16	TR	\$1,681,828	Dec-19	SA	\$1,464,786
Dec-16	US	\$973,324	Dec-19	JO	\$927,878
Dec-16	EG	\$702,776	Dec-19	EG	\$706,802
Dec-16	AE	\$505,964	Dec-19	GR	\$691,875

From December 2016 through December 2019, *FZ Trading Companies* completely changed the countries to which they sent *outgoing wires*.

- In period 1 (December 2016), *FZ Trading Companies* sent all *outgoing wires* to one country – the US.
- In period 7 (December 2019), *FZ Trading Companies* sent the highest value of their *outgoing wires* to 5 beneficiary counterparty countries – Ukraine, UAE, China, Jordan and Luxembourg.
- Data reflects that *FZ Trading Companies* maintained the same counterparties from December 2016 through December 2018. *FZ Trading Companies* began changing the beneficiary counterparty countries in June 2018 to higher risk countries such as Turkmenistan and Jordan.

FZ TRADING COMPANIES - BENEFICIARY COUNTERPARTY COUNTRIES					
PERIOD 1 (12/16)	GEO	VALUE	PERIOD 7 (12/19)	GEO	VALUE
Dec-16	US	\$10,233,983	Dec-19	UA	\$10,029,807
			Dec-19	AE	\$2,305,543
			Dec-19	CN	\$1,008,405
			Dec-19	JO	\$703,760
			Dec-19	LU	\$645,500

ONSHORE TRADING and NON-TRADING COMPANIES – TOP COUNTERPARTY GEOGRAPHIES

ONSHORE TRADING COMPANIES – Counterparty Geographies

From December 2016 through December 2019, *Onshore Trading Companies* only changed two of the top five countries from which they received *incoming wires*.

- In period 1 (December 2016), *Onshore Trading Companies* received the bulk of their incoming wires from 5 countries – Singapore, UAE, Turkey, Korea, and Saudi Arabia.
- In period 7 (December 2019), *Onshore Trading Companies* received the highest value of their incoming wires from 5 originator counterparty countries – UAE, Kazakhstan, Singapore, Korea and US.
- In general, originator counterparty countries sending incoming wires to Bank A's Onshore Trading Company customers did not change much during the seven review periods, apart from one-off, non-recurring wires received from Poland and India.
- One exception was counterparty originator country Taiwan that sent \$12.3 MM in June 2019 that stopped in December 2019.

ONSHORE TRADING COMPANIES - ORIGINATOR COUNTERPARTY COUNTRIES					
PERIOD 1 (12/16)	GEO	VALUE	PERIOD 7 (12/19)	GEO	VALUE
Dec-16	SG	\$25,552,620	Dec-19	AE	\$818,594
Dec-16	AE	\$3,112,543	Dec-19	KZ	\$752,858
Dec-16	TR	\$2,367,212	Dec-19	SG	\$706,076
Dec-16	KR	\$1,351,435	Dec-19	KR	\$600,000

Dec-16	SA	\$978,190	Dec-19	US	\$511,305
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From December 2016 through December 2019, *Onshore Trading Companies* significantly changed 4 of the top five countries to which they *sent outgoing wires*.

- In period 1 (December 2016), *Onshore Trading Companies* sent all low value, outbound wires to two countries – UAE and Uruguay.
- In period 7 (December 2019), *Onshore Trading Companies* sent the highest value of their incoming wires to 5 beneficiary counterparty countries – US, Korea, UAE, China and Mexico.
- In general, beneficiary counterparty countries receiving wires from Bank A’s Onshore Trading Company customers did not change much during the seven review periods, apart from one-off, non-recurring, low value wires *sent to* Malaysia, Netherlands, Seychelles and China.
- One exception was counterparty originator country Taiwan that sent in \$12.3 MM in June 2019 that stopped in December 2019.

ONSHORE TRADING COMPANIES - BENEFICIARY COUNTERPARTY COUNTRIES					
PERIOD 1 (12/16)	GEO	VALUE	PERIOD 7 (12/19)	GEO	VALUE
Dec-16	AE	\$70,095	Dec-19	US	\$8,444,875
Dec-16	UY	\$53,600	Dec-19	KR	\$8,140,943
			Dec-19	AE	\$4,239,654
			Dec-19	CN	\$818,632
			Dec-19	MX	\$785,000

ONSHORE NON-TRADING COMPANIES (NTCs) – Counterparty Geographies

From December 2016 through December 2019, *Onshore NTCs* changed only two of the top five originator counterparty countries from which they *received incoming wires*.

- In period 1 (December 2016), *Onshore NTCs* received the majority of incoming wires from 5 countries – UAE, US, Saudi Arabia, Kazakhstan, and Korea.
- In period 7 (December 2019), *Onshore NTCs* received the highest value of their incoming wires from 5 originator counterparty countries – Korea, UAE, US, Egypt and Singapore.
- In general, originator counterparty countries sending incoming wires to Bank A’s customers did not change much during the seven review periods, apart from one-off, non-recurring wires *received* from the Virgin Islands, Thailand, Chile and Oman.

ONSHORE NTCs - ORIGINATOR COUNTERPARTY COUNTRIES					
PERIOD 1 (12/16)	GEO	VALUE	PERIOD 7 (12/19)	GEO	VALUE
Dec-16	AE	\$10,612,036	Dec-19	KR	\$5,940,840
Dec-16	US	\$2,257,537	Dec-19	AE	\$2,437,880
Dec-16	SA	\$1,013,252	Dec-19	US	\$1,747,144
Dec-16	KZ	\$985,428	Dec-19	EG	\$1,282,612
Dec-16	KR	\$793,313	Dec-19	SG	\$1,136,873

From December 2016 through December 2019, *Onshore NTCs* changed four of five countries to which they *sent outgoing wires*.

- In period 1 (December 2016), *Onshore NTCs* sent all two, low value *outgoing wires* to two countries – the US and Uruguay.
- In period 7 (December 2019), *Onshore NTCs* sent the highest value of *outgoing wires* to 5 beneficiary counterparty countries – the UAE, Switzerland, Jordan, Singapore, and UK.
- Data shows that *Onshore NTCs* maintained the same pattern of sending low value wires to two beneficiary counterparty countries from December 2016 through December 2017. In June 2018, *Onshore NTCs* began changing beneficiary counterparty countries to a wider range of countries such as Pakistan, Indonesia, Trinidad, Canada and Thailand.

ONSHORE NTCs - BENEFICIARY COUNTERPARTY COUNTRIES					
PERIOD 1 (12/16)	GEO	VALUE	PERIOD 7 (12/19)	GEO	VALUE
Dec-16	AE	\$70,095	Dec-19	AE	\$101,518,513
Dec-16	UY	\$53,600	Dec-19	CH	\$22,709,372
			Dec-19	JO	\$16,031,027
			Dec-19	SG	\$4,217,965
			Dec-19	GB	\$3,375,575