U.S. MONETARY POLICY
EMERGING MARKET ECONOMIES

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EXECUTIVE SUMMARY

This report provides an analysis and evaluation of the United States' monetary policy and how emerging market economies, specifically BRIC countries, are heavily influenced by a change in the U.S.'s monetary policy

The first half of the research focuses on how open market operations and discount rates are a big part of the U.S.'s monetary policy and that the federal funds rate is closely related to the inflation rate based on the U.S.'s CPI. A prediction of a tightening in the U.S.'s monetary policy was also given at the end of this section.

The second half of the research focuses on each BRIC's country trading pattern and revealed that each country is heavily trade reliant on the United States. Moreover, it is shown that the United States is the top 5 trading partner for each of the BRIC country with them being top 3 for two of the four countries. It is also highlighted that each of the four BRIC countries are currently experiencing a trade surplus and has been doing so for the recent years.

The report also gave a prediction of how the BRIC countries' trade surplus will be affected by the tightening of the U.S.'s monetary policy. Most of these countries will experience a decrease in their trade surplus, some more than others.

THE U.S. MONETARY POLICY

The Federal Reserve conducts its actions based on the decisions of the Congress; to maximize employment and keep prices/inflation stable. By maintaining these two standards, the Federal Reserve directly affects the short-term interest rate of loans and availability of currency, which then indirectly affects the long-term interest rates, exchange rates and price of equities and assets (also known as the monetary policy).

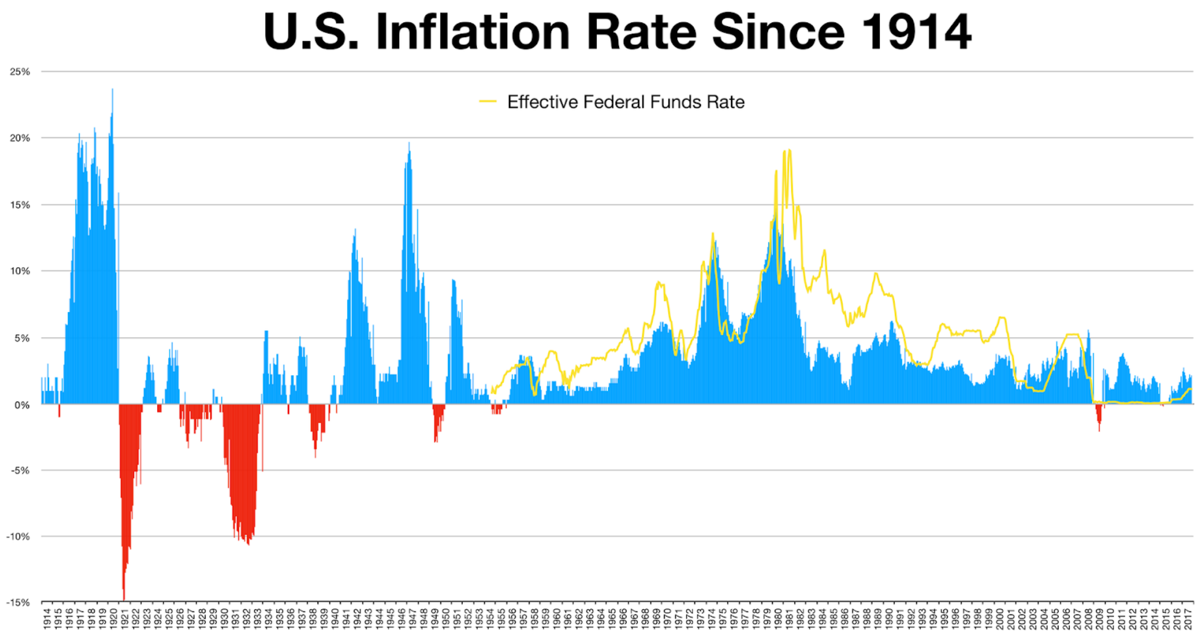
OPEN MARKET OPERATIONS

The federal funds rate is the rate determined by the Federal Open Markets Committee (FOMC) in which depository banks lend out money to other banks on an overnight basis. This is the rate that banks use to loan out money. Essentially, the FOMC will decide whether this rate needs to be increased or decreased based on projections of inflation and employment. If they decide that inflation is too high or will skyrocket, they will want to increase the federal funds rate by decreasing the supply of money in the market; they will sell government bonds, effectively reducing the money supply in the markets, forcing the banks to charge a higher prime rate for any funds they lend out. On the other hand, if the FOMC deduces that the economy needs a boost, they will call for a reduced federal funds rate and therefore buy back government bonds, increasing the money supply in the market and allowing for banks to have a reduced prime rate, allowing for businesses and the average person to borrow money at a lower interest rate, resulting in a positive economic boost.

DISCOUNT RATE

The FOMC also determines the discount rate. This is a rate at which banks can borrow money from the Federal Reserve. This is typically set above the federal funds rate and acts as a backup for the federal funds rate. Banks are able to borrow at this rate, but generally do not unless circumstances deem otherwise. The discount rate can be used when open market operations become disrupted, as was during the financial crisis.

TRENDS



As can be seen in the above graph, the federal funds rate closely follows the inflation rate which is denoted in the percentage difference between the current CPI and the previously measured CPI, whether that be monthly, quarterly, semi-annually, or annually. The CPI has ranged over the years based on what consumers spent their income on. Currently, more than 75% of the current CPI market basket is mixed between housing, food and beverage, and transportation. This indicates that price increases or decreases in these sectors have the greatest effect on CPI, resulting in an increased or decreased rate of inflation. The FOMC uses inflation to determine the federal fund rate, as can be seen in the chart above. When inflation tends to get out of hand, the FOMC raises the federal funds rate in attempts to keep inflation under control. This can be seen in years 1973 and 1980, when the FOMC raised the federal funds rate above the rate of inflation to effectively bring the economy to a more stabilized and controlled growth. Also recognizable in the chart is the mode of action the FOMC takes when there is stagnation; the FOMC drops the federal funds rate in hopes to stimulate growth in the economy. This can be clearly recognized following the financial crisis in 2008 where deflation caused the FOMC to drop the federal funds rate down to next-to-nothing.

PREDICTIONS

With Trump’s election into the White House, concerns arise regarding the future of the U.S. economy. Trump has proposed some radical changes that will affect the American economy and any economic bodies that interact with the U.S.

IMPOSED IMMIGRATION BARRIERS

Trump is looking to cut the number of immigrants in the U.S. economy. This is highly problematic for the U.S. economy as a majority of internally generated income comes from immigrant workers. These workers tend to consume locally produced goods using generated income; food, transportation, etc. As these workers spend their income, businesses have more money to play with and can then hire more workers. For every immigrant worker, 1.2 jobs are created for Americans, typically taken up by Native workers. By setting up policies that will deport between 5 and 6.5 million immigrant workers, the U.S. economy will be severely effected, and the US's reputation may be affected, leading to negative results on the U.S. economy and trade relationships with other countries, respectively. The result of deportation of workers will drive the wage up, causing businesses to tighten their belts, resulting in an even larger decrease in demand for workers, as businesses must face higher wages and reduced revenues. The result will be less jobs for Americans and expensive goods, particularly in the agriculture and foods industry as this is where the majority of immigrants work, due to the increased wage rates and decreased revenues of businesses. This will most likely result in a stagnating economy and will have certain implications for the FOMC and the U.S.

TAX REFORMS

Trump has suggested major tax cuts to ensure that the U.S. economy continues to grow despite the negative effects of a contractionary effort on behalf of immigration laws on wage rates. He has proposed tax cuts across the board, mainly for large businesses, yet some middle-class individuals will have higher tax rates. Because this would have put America in severe deficit, Trump suggested that government spending be cut as well. The effects of this decision would result in contractionary impacts on the markets and the U.S. economy. If there was an increase to the U.S. deficit, creditors would demand higher interest rates on U.S. government bonds. Currently, 44% of U.S. treasury bonds are held by foreign investors. A demand for higher interest rates from more than ⅖ of the holders of U.S. treasury bonds will potentially, yet not exclusive, to two possibilities; FOMC will have to raise the federal funds rate and/or the price of U.S. treasury bonds will fall.

TRADE TARIFFS AND IMPOSITIONS

Trump is aggressively imposing that China pay tariffs on exports to the U.S. as well as bow down to the U.S.'s demands; for China to give up possession of intellectual property as well as ending currency pegging. These demands cause tension between China and the U.S. and create potential to barriers which will indefinitely increase the price of imports from China to the U.S. Along with these tensions, the U.S. is trying to impose tariffs on all imports. This will have a result in two fashions; one, which will be definite, is that the price of goods being sold in the U.S. will be more expensive for consumers; two, which may or may not happen, is the creation of jobs for

U.S. workers. The reason workers may not get work is because imports plus tariffs may prove to be cheaper than goods produced within the US.

OVERALL EXPECTED EFFECT ON MONETARY POLICY

The U.S. bases its monetary policy off inflation and employment. Inflation is the rise in prices of the CPI, which is a basket of consumer goods. There will be factors that push the price of the goods that consumers purchase up; a price increase in agriculture goods due to the wage increase due to deportation of immigrants; an increase in interest expense due to a higher federal funds rate as a direct effect of demand from foreign investors due to tax reforms; higher priced goods due to import tariffs. The result will be an inflated CPI, driving the inflation rate up. If the FOMC determines that this needs to be controlled, which it most likely will, the FOMC will determine a higher federal funds rate. This will be achieved by contracting the supply of money in the markets. The Federal Bank, in this case, will sell government bonds in order to pull out money from the market, reducing the money supply and driving the interest rate up. This will become problematic as this will increase the deficit that America already has. A reduced money supply will appreciate the dollar, which will have certain implications on foreign emerging market economies.

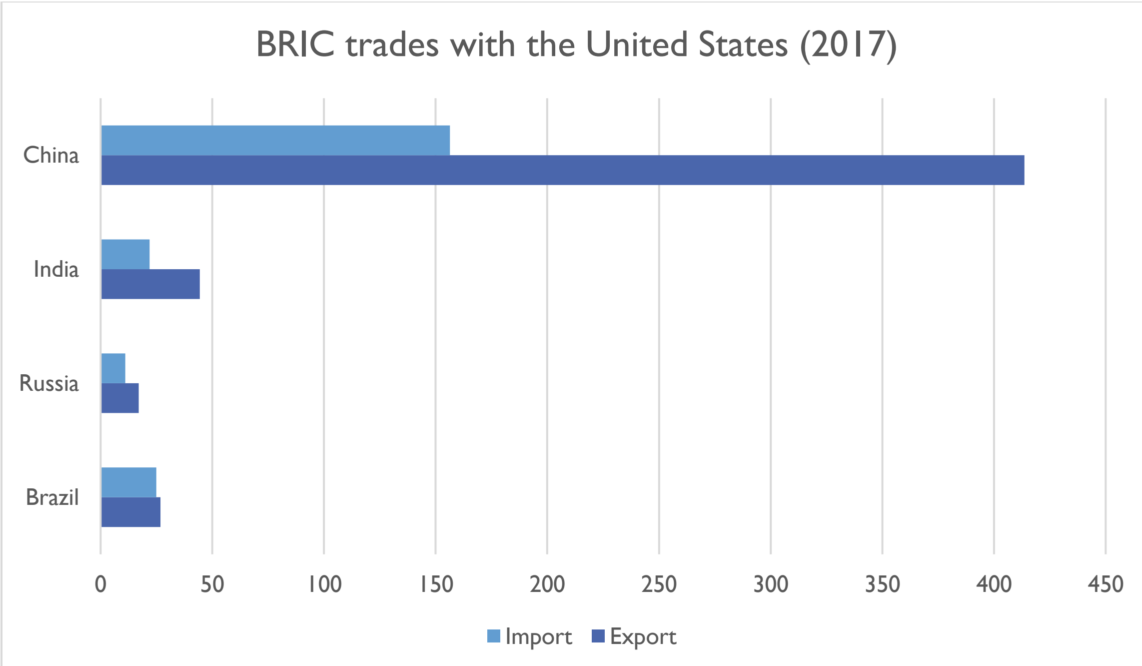
THE EMERGING MARKET ECONOMIES

DEFINITION AND RELATIONS TO THE UNITED STATES

An emerging market economy, according to the MSCI market classification index, is described as an economy that has some traits of a developed economy such as high GDP output but does not meet the standards of a developed economy, typically a high unemployment rate, high inflation rate and other indicators (MSCI Inc.). The most popular emerging market economies are the BRICs; Brazil, Russia, India and China.

Jim O'Neill, an economist from Goldman Sachs, first predicted that these four economies will become a global superpower in the world with India and China controlling manufactured goods and Brazil and Russia controlling natural resources. Together, they produce 40% of the world's GDP (Financial Times). However, as they are currently growing economies, trading and international relations still play a big part of the growth of the BRICs; as mentioned in the gravity theory of trade, large economies are more likely to trade with fellow large economies. This means that these emerging market economies are most likely to trade with today's world superpower: The United States. The diagram and table below summarize the trading patterns of each BRIC country with the US.

	Brazil	Russia	India	China
Export Value to the US	$26.8B	$17.0B	$44.4B	$413.6B
Percentage of total exports	12.3%	3.2%	16.1%	18.3%
US's rank as the country's top export partner	3	6	2	1
Import Value from the US	$24.9B	$11.1B	$21.9B	$156.4B
Percentage of total imports	16.5%	6.1%	5.7%	8.5%
US's rank as the country's top import partner	3	3	3	5



*each data is taken from the WTO database and is accurate as of 2017

As seen above, the United States is still a significant trade partner with most of the BRIC countries. For Brazil and India, the U.S. is the top 3 country for both their import and export partners. China exports most of their products to the US. This shows that each country is reliant on the U.S. and a change in the U.S. monetary policy will impact each of the BRICs' trading patterns. The next two sections of the report outlines the pattern of trade of each country with the United States and how a change in the U.S.'s monetary policy will impact these patterns of trade.

TRADING PATTERNS OF THE BRICS[1]

BRAZIL

As of the year 2016, Brazil was ranked as the 21st largest exporter in the world's economy. Since the year 2001, Brazil has consistently held a positive trade balance. Prior to 2001, it held consistently held a trade deficit as its imports exceeded exports. Relative to other countries, the

[1] All data are gathered from the observatory of economic complexity (OEC) website by Alexander Simoes at the Michigan Institute of Technology website (https://atlas.media.mit.edu/en/)

economic complexity of Brazil is less complex than countries such as the U.S., yet more elaborate than countries such as Zambia. Top exports include vegetable products (16%), mineral products (15%), food materials (13%), and transportation (11%). Top imports include machines (27%), chemical products (21%), and mineral products (12%). As noted, Brazil's export portfolio is diversified. Imports, however, are slightly concentrated. In regards to Brazilian market growth, the market accelerated from the years 2002 to 2008. From 2008-2009 there was a significant drop in exports and imports most likely due to the financial crisis. For the next 3 years there was steady increase followed by a steady decline. The positive trade balance in 2016 is currently the highest it has ever been for the country.

RUSSIA

Russia consistently runs on a trade balance surplus due to their export-heavy economy. In January of 2018, Russia recorded a US$17 billion trade surplus which is the greatest surplus they have recorded since 2015 (Ferreira). They export mainly oil and natural gas making up a total of 62.8% of their export, of which they mostly trade with the European Union. As a matter of fact, two of their top three trading partners in 2015 reside within the European Union with Germany coming a close 4^{th} (World Bank). Regarding imports, 19.3% of Russia's total imports from China. This consists mainly of machinery and vehicles. Overall, Russia's trade surplus is growing due to their main export of oil to the European Union and it does not seem to be slowing down anytime soon.

INDIA

As of 2016, India was ranked as the 18th largest exporter in the world's economy. Since the year 1998, India has consistently held a positive trade balance. Prior to 1998, it held consistently held a roughly equal import to export values. Relative to other countries, much like

Brazil, India's economic complexity is less complex than the likes of U.S. yet more elaborate than countries like Zambia. Top exports include precious metals (16%), textiles (14%), chemical products (13%), and mineral products (11%). Top imports are mineral products (28%), machines (20%), and Precious metals (14%). As a result, India's exports are diversified, yet, imports are concentrated. In terms of India's market growth, much like Brazil, India's market accelerated from the years 2002 to 2008 with a sharp drop in 2008-2009 due to the financial crisis. For the next 3 years there was steady increase, followed by a steady decline. The positive trade balance in 2016 is currently the highest it has ever been for the country.

CHINA

China's economy is currently moving away from an investment-led model to a consumption-led and services-based model(HSBC). This is due to an oversupply in housing which has resulted in a slowed growth for the building investment sector. China's import structure is expected to progressively change as the country's economy continues to rebalance. A large portion of Chinese imports will still be occupied by commodities, however, consumer goods, particularly food and agricultural products, are on the rise and will likely represent an increasing share of total imports. In addition, greater opportunities are likely to surface in its service sectors, as China continues to transition structurally.

OVERALL TREND OF BRIC'S TRADING PATTERNS

All four of these countries have a positive trade balance in the recent years due to the same reason; consistently having high imports. However, it can be concluded that most of these countries' trades have declined over the years. This is most likely to be caused by the recent financial crisis leading to each country consuming less.

IMPACT OF A CHANGE IN THE U.S. MONETARY POLICY

As mentioned in the previously, it is expected for the U.S. to tighten their monetary policy by decreasing money supply, resulting in an increase to the interest rate. A tightened monetary policy is most likely to result in decreased domestic spending as well as decreased imports. Additionally, producers are also inclined to slow production as the cost of borrowing increases costs across the board and demand from consumer decreases. This section of the report will highlight how this change affects the trading patterns of the four emerging market economies that has been selected.

IMPACT ON BRAZIL

Brazil trades significantly with the United States. This means that a change in the U.S. monetary policy will very likely affect the Brazilian trade balance and how Brazil will trade with the rest of the world.

A decrease in the U.S. demand for Brazilian imports will have a negative effect on Brazil's export market. However, the top two exports to the U.S. are spacecrafts/planes and turbine engines[2]. One of the biggest consumer of planes and turbine engines in the United States is the government, who spend a significant amount of their budget for national defense and the army. Although the U.S. is one of the largest demander of spacecraft, there are 6 other large importing countries who import spacecraft at the same, or even greater, quantities than does the U.S. This implies that the demand for spacecraft is elastic and that Brazil can export to other countries without taking a huge hit because of the U.S.'s retraction efforts. Although, one thing to note is that Brazil will now be exporting with additional costs, as detailed in the gravity theory of trade; Brazil will need to incur more costs in order to export to other countries. A decrease in demand on

[2] Refer to Appendix A Section 4

U.S.'s part and more costly exports to other countries will cause the aircraft industry in Brazil to shrink.

Brazil mainly imports refined petroleum from the United States. To analyze the effect of a decrease in supply of U.S. exports, it must be analyzed on whether refined petroleum is price elastic. The U.S. is the biggest exporter of refined petroleum with Russia being second, Singapore being close third and Netherlands coming close after[3]. The biggest refined petroleum exporter in South America is Colombia with 0.48% of the world's total refined petroleum export. Because the U.S. is the largest producer of refined petroleum in the world, the price of refined petroleum fluctuates based on what happens in the U.S. With these facts, it can be concluded that Brazil will be faced with importing petroleum at a higher price due to the laws of demand and supply. As reduced supply from the U.S. drives the price of refined petroleum up, Brazil will be forced to pay more for the same amount of imports as the good is inelastic; the net effect on imports would be an increase on imports.

Therefore, it can be concluded that a tightening U.S. monetary policy will cause Brazil's imports to become more expensive and will cause the export industry to shrink. This will have an ambiguous affect on Brazil's trade balance as the effect would be a net of the decrease in imports and decrease in exports.

IMPACT ON RUSSIA

Russia's trade with the U.S. is not significant relative to the other three countries discussed. This can be seen through political trade sanctions between Russia and the U.S., as well as the limited trade between the two countries(Dewan). This shows that most of Russia's exports have

[3] Full visualization available in Appendix C

been banned or restricted to the United States for recent memory and their recent increase in trade surplus most likely has nothing to do with any United States influence.

In the situation where the United States tighten their monetary policy, there might be some, but not relatively significant, effects on Russia's trading patterns. Less spending in the United States will result in less Russian imports being consumed in the United States. However, as stated before, Russia does not export a lot of their products to the United States therefore this will not heavily impact their total export volume.

Russia imports little from the U.S. as well; only 6.1% of total imports. Because they import little from the U.S., any price hikes due to the contractionary monetary policy will not severely affect Russia's import portfolio.

IMPACT ON INDIA

The U.S. is India's top export destination and second largest import origin. Because of this dependency on trade, we can deduce that there will be several effects of the contractionary monetary policy on India's economy.

India mainly exports diamonds to the United States. The U.S. is the main importer of diamonds in the world yet is closely followed by four other countries. Because the U.S. is the largest importer of diamonds, a reduce in demand because of a contractionary monetary supply will force the price of diamonds up worldwide and reduce the worldwide demand for diamonds just slightly. This will be beneficial to India since diamonds are fairly inelastic; they can be replaced by other precious stones yet the consumer demand behind diamonds specifically is huge. Adding to this, India can diversify their diamond export to other countries as demand for diamonds is elastic; many countries demand large volumes of diamonds. Therefore, a price increase in diamonds due to a reduced demand will be beneficial to India's export industry as the reduced quantity demanded will be outweighed by the price increase for diamonds.

India mainly imports gold from the U.S. Gold is an inelastic commodity that is produced by a multitude of countries. Because of this factor, India will be mainly unaffected by the U.S. contractionary monetary policy. India will be able to import gold from other gold-producing countries at the same quantity with relative no impact on price. That being said, gold only makes up 6.9% of imports from the U.S., suggesting that there are other goods that are imported from the U.S.; goods that may be affected by the contractionary money supply. Therefore, the affect seems ambiguous, yet it can be speculated that India's imports will be more expensive, potentially resulting in a negative effect on the Indian import economy.

The result on India's economy will be ambiguous as the affect of the contractionary monetary policy's effect on imports is ambiguous. As per exports, the change in the U.S.'s monetary policy is beneficial to India's export industry. The net result will be a net of the changes in India's trade industry.

IMPACT ON CHINA

The U.S. is China's biggest export partner. The U.S. is China's third largest import partner. Because of the integrated trade relationship between China and the U.S., China will most definitely be affected by the changes in the monetary policy in the U.S.

China mostly exports manufactured goods; electronics, to the United States with computers being 11% of their total export[4]. A contractionary monetary policy in the United States will cause the demand for Chinese imports to shrink in quantity yet hike the price of Chinese goods. Trade

[4] See Appendix A Section 1

revenue will be jeopardized because the goods that China exports to the U.S. are dominated by the manufacturing industry, an industry dominated by elastic goods. The price hike will not make up for the lost revenue due to a reduction in quantity demanded, eventually hurting China's export industry.

China mainly imports soybeans and vehicles, such as planes and cars, from the United States. China, however, can import these goods from a multitude of locations. Soybeans are mainly produced by the U.S. and Brazil. The contractionary monetary policy along with the immigration laws being put into effect by Trump and administration will result in a huge impact on the U.S.'s soybean industry. As supply reduces, there will be a price increase in soybeans. It can be deduced that the supply of the soybean is inelastic as there are only two main producers of the soybean. Because of this fact, China will be forced to pay a higher price for the same soybean. The soybean is elastic, and China can choose not to import the soybean if they so wished to. Planes and cars are elastic as well, yet they are not a fully homogenous product, and therefore, there may arise issues if China wished to import from other sources. With the price rises of American imports, China will be faced with the decision to purchase the semi-homogenous cars and planes at a higher price or to import from other sources, as there are many exporters of both good.

The resultant effect on China's trade balance will be a net of the effects of the export and import industry. The export industry will be hurt as the U.S. imports a large amount of China's goods. The import industry, however, may shrink but can stay the same as well as there are alternative countries to purchase cars and airplanes from. The U.S.'s contractionary monetary policy is, most likely, going to negatively affect China's trade balance.

APPENDIX A: TRADING PATTERNS OF EACH BRIC

CHINA (SECTION 1)

CHINA AND THE U.S.

Total $386B - China's top exports to the U.S. are computers (11% - $42.46B), broadcasting equipment (6.8% - $26.25B) and telephones (3.0% - $11.58B).

Total $135B - China's top imports from the U.S. are soybeans (10% - $13.5B), planes, helicopters, and spacecraft (9.3% - $12.55B) and cars (8.8% - $11.88B).

CHINA AND RUSSIA

Total $32.3B - China's top imports from Russia are crude petroleum (52% - $16.79B), sawn wood (7.2% - $2.33B) and raw nickel (6.6% - $2.13B).

Total $37.3B - China's top exports to Russia are furskin apparel (6.9% - $2.57B), broadcasting equipment (4.5% - $1.68B) and computers (3.7% - $1.38B).

CHINA AND INDIA

Total $11.8B - China's top imports from India are diamonds (21% - $2.48B), non-retail pure cotton yarn (8.9% - $1.05B), refined copper (8.4% - $0.99B) and iron ore (7.2% - $0.85B).

Total $58.4B - China's top exports to India are telephones (7.1% - $4.15B), semiconductor devices (4.7% - $2.74B), computers (4.5% - $2.63B) and broadcasting equipment (4% - $2.33B).

CHINA AND BRAZIL

Total $45.9B - China's top imports from Brazil are soybeans (34% - $15.6B), iron ore (28% - $12.85B) and crude petroleum (13% - $5.97B).

Total $22B - China's top exports to Brazil are telephones (4.3% - $0.95B), lcds (3% - $0.66B), broadcasting equipment (2% - $0.44B), synthetic filament yarn woven fabric (1.7% - $0.37B) and electric heaters (1.7% - $0.37B).

INDIA (SECTION 2)

INDIA AND THE U.S.

Total $20.4B – India's top imports from the U.S. are aircraft parts (6.9% - $1.41B), gold (6.5% - $1.33B) and valves (6% - $1.224B).

Total $42B – India's top exports to the U.S. are diamonds (18% - $7.56B), packaged medicaments (5.3% - $2.23B).

INDIA AND CHINA

Total $60.5B - India's top imports from China are telephones (11% - $6.65B), broadcasting equipment (6.4% - $3.87B) and computers (5.6% - $3.38B).

Total $8.92B - India's top 3 exports to China are iron ore (11% - $0.98B), non-retail pure cotton yarn (11% - $0.98B) and refined petroleum (7.8% - $0.69B).

INDIA AND RUSSIA

Total $4.78B - India's top imports from Russia are diamonds (39% - $1.86B), coal briquettes (6% - $0.29B) and newsprint (4.4% - $0.21B).

Total $1.81B - India's top exports to Russia are packaged medicaments (18% - $0.32B), spark-ignition engines (6% - $0.11B) and tea (5.7% - $0.10B).

INDIA AND BRAZIL

Total $3.61B - India's top imports from Brazil are crude petroleum (27% - $0.97B), raw sugar (25% - $0.90B) and soybean oil (13% - $0.47B).

Total $2.3B - India's top exports to Brazil are pesticides (15% - $0.34B), non-retail synthetic filament yarn (7.9% - $0.18B), packaged medicaments (6.8% -$0.15B) and vehicle parts (6.5% - $0.15B)

RUSSIA (SECTION 3)

RUSSIA AND THE U.S.

Total $11.1B - Russia's top imports from the U.S. are unspecified (27% - $2.99B), cars (6.2% - $0.69B) and packaged medicaments (3.8% - $0.42B).

Total $9.4 B - Russia's top exports to the U.S. are refined petroleum (34% - $3.19B), raw aluminum (17% - $1.59B) and unspecified (14% - $1.32B).

RUSSIA AND CHINA

Total $38.1B - Russia's top imports from China are other heating machinery (10% - $3.81B), broadcasting equipment (8.2% - $3.12B) and computers (6.7% - 1.41B).

Total $28B - Russia's top exports to China are crude petroleum (53% - $14.84B), refined petroleum (7.1% - $1.99B) and sawn wood (5.4% - $1.51B).

RUSSIA AND INDIA

Total $5.31B - Russia's top exports to India are unspecified (24% - $1.27B), diamonds (15% - $0.79B) and silver (3.2% - $0.17B).

Total $2.4B - Russia's top imports from India are packaged medicaments (18% - $0.96B), tea (6% - $0.32B) and raw tobacco (4.8% - $0.25B).

RUSSIA AND BRAZIL

Total $2.52B - Russia's top imports from Brazil are a variety of meats, most predominantly pig meat (23% - $0.58B) and frozen bovine meat (16% - $0.36B), soybeans (16% - $0.36B) and raw tobacco (8.4% - $0.21B).

Total $1.79B - Russia top exports to Brazil are nitrogenoUS fertilizers (33% - $0.59B), mixed mineral or chemical fertilizers (21% - $0.38B) and refined petroleum (17% - $0.30B).

BRAZIL (SECTION 4)

BRAZIL AND THE U.S.

Total $24.1B - Brazil's top imports from the U.S. are refined petroleum (13% - $3.13B), gas turbines (10% - $2.41B) and packaged medicaments (3% - $0.72B).

Total $23.3B - Brazil's top exports to the U.S. are planes, helicopters and spacecrafts (13% - $3.03B), gas turbines (8.7% - $2.03B) and crude petroleum (4.8% - $1.12B).

BRAZIL AND CHINA

Total $23.4B - Brazil's top imports from China are telephones (6.5% - $1.15B), broadcasting accessories (3.2% - $0.75B), integrated circuits (2.6% - $0.61B) and office machine parts (2.6% - $0.61B)

Total $35.1B - Brazil's top exports to China are soybeans (41% - $14.39B), iron ore (21% - $7.37B) and crude petroleum (11% - $3.86B).

BRAZIL AND RUSSIA

Total $2.02B - Brazil's top imports from Russia are mixed mineral or chemical fertilizers (17% - $0.34B), potassic fertilizers (16% - $0.32B), raw aluminum (14% - $0.28B) and refined petroleum (12% $0.24).

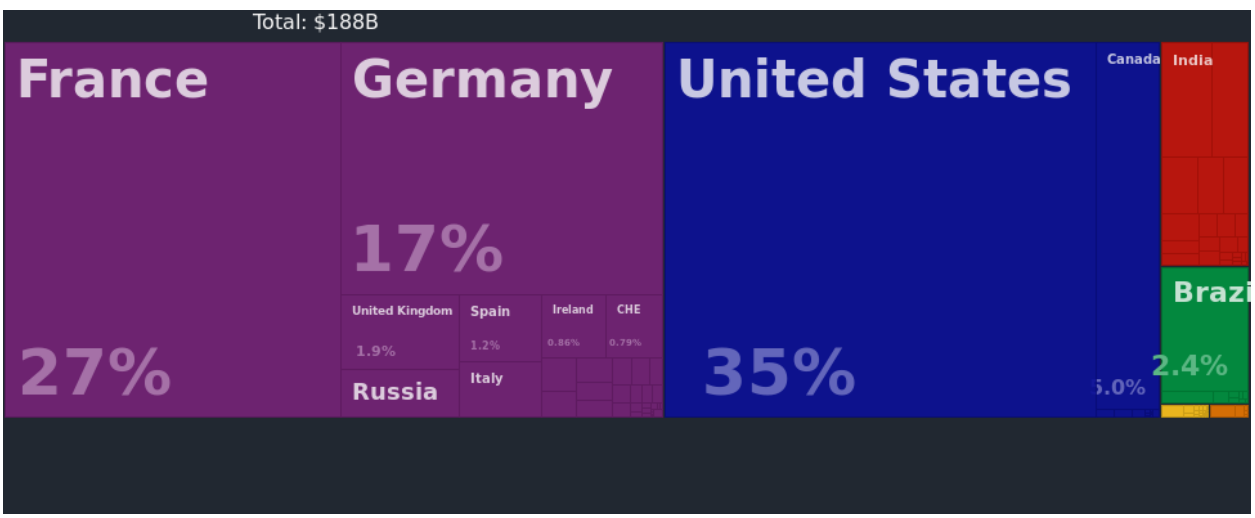
Total $2.3B - Brazil's top exports to Russia are pig meat (22% - $0.51B), soybeans (18% - $0.41B) and raw sugar (12% - $0.27B).

BRAZIL AND INDIA

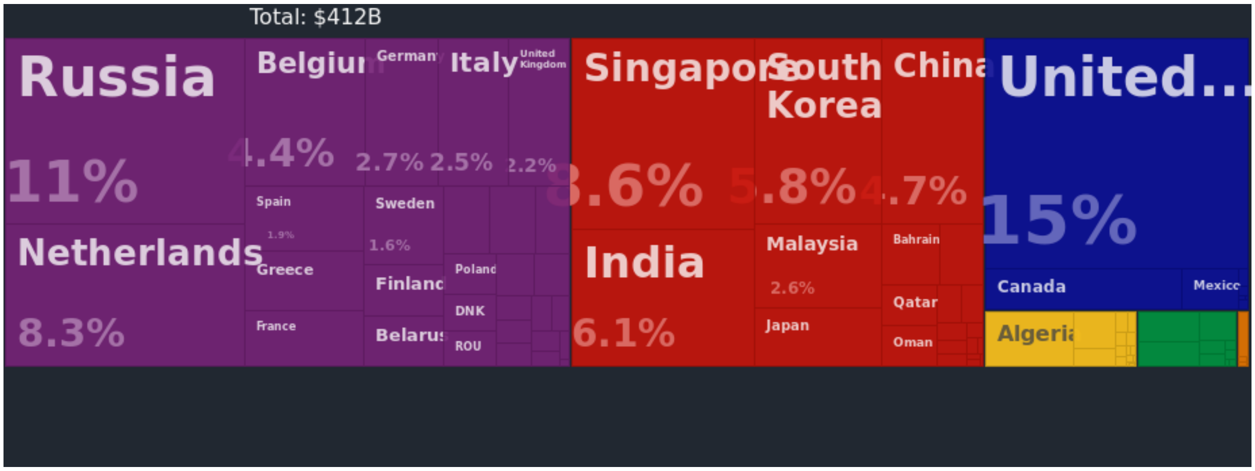
Total $2.48B - Brazil's top imports from India are pesticides (10% - $0.25B), refined petroleum (7.2% - $0.18B) and non-retail synthetic filament yarn (7% - $0.17B).

Total $3.16B - Brazil's top exports to India are raw sugar (28% - $0.88B), crude petroleum (21% - $0.66B) and soybean oil (12% - $0.38B).

APPENDIX B: AIRCRAFT PRODUCERS BY COUNTRY (BY OEC)



APPENDIX C: REFINED PETROLEUM EXPORTERS BY COUNTRY (BY OEC)



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