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THESIS

**DESCRIPTIVE ANALYSIS AND STRATEGIC OPTIONS
TO DEFEAT COMMODITY-BASED THREAT
FINANCING METHODOLOGIES RELATED TO GOLD**

by

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September 2015

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TO GOLD**

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ABSTRACT

This thesis identifies the contributions of gold from mine to market in financing nefarious organizations, sustaining illicit economies, and impacting national economies. After identifying common practices at all levels of operations and the market participants involved, regional cases from Africa, the Middle East, Indian Subcontinent, and South America are discussed, which illuminate the vulnerabilities in this trade. Nongovernmental organization, intergovernmental organization, and state responses are also discussed in their efforts to counter threat financing, formalize operations, and identify problematic sourcing of this highly liquid commodity. Threat financing being transnational in nature, the international policy environment in the context of the Financial Action Task Force is also analyzed to illuminate network structures and identify at-risk states.

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LIST OF ACRONYMS AND ABBREVIATIONS

3TG	cassiterite, columbite and tantalite, wolframite, and gold
AML/CFT	anti-money laundering/combating the financing of terrorism
APG	Asia/Pacific Group on Money Laundering
ASM	artisanal and small-scale mining
AQ	Al Qaeda
CAR	Central African Republic
CFATF	Caribbean Financial Action Task Force
CIA	Central Intelligence Agency
CNT	National Transitional Council (Democratic Republic of the Congo)
CTF	counter threat finance
CTR	currency transaction report
DGCX	Dubai Gold & Commodities Exchange
DGD	Dubai good delivery
DMCC	Dubai Multi Commodities Centre
DNFBP	designated non-financial bodies and professions
DOD	Department of Defense
DoS	Department of State
DPRK	Democratic People's Republic of Korea
DRC	Democratic Republic of the Congo
EAG	Eurasian Group on Combating Money Laundering and Financing of Terrorism
ESAAMLG	Eastern and Southern Africa Anti-Money Laundering Group
EY	Ernst & Young
FATF	Financial Action Task Force
FinCEN	Financial Crimes Enforcement Network
FIU	Financial intelligence unit
FSRB	FATF-style regional body
GAFISUD	Financial Action Task Force on Money Laundering in South America
GAFILAT	Financial Action Task Force of Latin America

GAO	General Accounting Office (pre-2004), Government Accountability Office (2004-present)
GDP	gross domestic product
GEDRC	Group of Experts on the Democratic Republic of the Congo
GIABA	Inter-Governmental Action Group against Money Laundering in West Africa
GW	Global Witness
IGO	intergovernmental organization
IMF	International Monetary Fund
IVTS	informal value transfer systems
KYC	know your customer
LBMA	London Bullion Market Association
LRA	Lord's Resistance Army
LSM	medium and large scale mining
MENAFATF	Middle East and North Africa Financial Action Task Force
MINUSCA	United Nations Multidimensional Integrated Stabilization Mission in the Central African Republic
MONEYVAL	Committee of Experts on the Evaluation of Anti-Money Laundering Measures and the Financing of Terrorism
MONUSCO	United Nations Organization Stabilization Mission in the Democratic Republic of the Congo
NGO	non-governmental organization
OECD	Organisation for Economic Co-operation and Development
OHCHR	Office of the High Commissioner for Human Rights
OTC	over the counter
PECAR	Panel of Experts on the Central African Republic
PwC	PricewaterhouseCoopers
RBA	risk based assessment
RGG	London Bullion Market Association responsible gold guidance
RUF	Revolutionary United Front
SAR	suspicious activity report
SBS	Superintendent of Banking, Insurance, and Private Pension Funds
SNA	social network analysis

TBML	trade based money laundering
TCO	transnational criminal organizations
TTU	trade transparency unit
U.A.E.	United Arab Emirates
U.K.	United Kingdom
U.N.	United Nations
UNEP	United Nations Environment Program
USA PATRIOT Act	Uniting and Strengthening America by Providing Appropriate Tools Required to Intercept and Obstruct Terrorism Act
VEO	violent extremist organizations
WGC	World Gold Council

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I. INTRODUCTION

The financing of operations and the networks in which they exist are key components to the business model of transnational criminal (TCO) and violent extremist organizations (VEO). Complicating the financial operations of these networks, a complex policy environment exists that regulates money service businesses, allows government visibility on the transfer of value in the formal sector, and aims to promote the lawful integrity of the global financial system. As a result of the increased risk for potential discovery of operations by law enforcement and the intelligence community, transactions have been driven toward informal value transfer systems (IVTS), fiat currency alternatives, and a vast laundering network to disguise the source and destination of funds.

The worldwide scale of money laundering activities is extraordinarily vast. The United Nations Office on Drugs and Crime (2009, p. 7) conducted an analysis of previously reported data and estimated that the value of laundered funds from TCOs and drug trafficking organizations alone “would have been equivalent to around U.S. \$650 billion per year in the first decade of the new millennium, equivalent to 1.5% of global gross domestic product (GDP).” To put this in perspective, utilizing reported 2014 GDP figures from the World Bank, without even normalizing for inflation, this U.S. \$650 billion represents a position between the GDP of Sweden and Saudi Arabia and would be the 20th largest economy (World Bank, 2015a). It is worth noting that the Financial Action Task Force (FATF) does not attempt an independent estimate because of the difficulty in tracking these illegal funds (“F.A.Q.,” n.d., How much money is laundered per year section, para. 4).

This illicit economy has the power to destabilize governments and economies through the symbiosis of corruption, kleptocracy, illicit trade, and TCOs in areas with a weakened rule of law. The National Security Strategy acknowledges these destabilizing effects, threat financing’s inherently transnational nature, and the need for counter threat finance (CTF) efforts both domestically and internationally (White House, 2015, pp. 15, 21).

CTF has grown alongside the Global War on Terrorism and is viewed as a key component in the fight against TCOs and VEOs. DOD Directive 5205.14 (2012, pp. 11–12) states that

DOD activities and capabilities [are to] deny, disrupt, destroy, or defeat finance systems and networks that negatively affect U.S. interests in compliance with all existing authorities and procedures... DOD CTF counters financing used to engage in terrorist activities and illicit networks that traffic narcotics, WMD, Improvised Explosive Devices, other weapons, persons, precursor chemicals, and related activities that support an adversary's ability to negatively affect U.S. interests.

Understanding the financial systems, methods of IVTS, networks that these organizations utilize, and the documented nexus between TCOs and VEOs is an essential precursor to defeating these organizations.

Increased globalization has allowed threats to permeate across borders and transnational problems have become the norm. Similarly, in threat finance, these transnational networks are raising and transferring value in a sometimes borderless world. Leveraging the qualities of this environment, threat finance methodologies often take on obscure forms and the money trail is convoluted by the intersection of traditional IVTS, trade based money laundering (TBML) schemes, bulk cash and commodity smuggling, and revolutionary cryptocurrencies.

A. BACKGROUND

This thesis examines gold and the illicit exploitation of its operations from mine to market. Its importance to CTF resides in the nature of gold's value density, anonymity, and its problematic propensity to exploitation. Like other threat finance methodologies, its abuse from mine to market does not exist in a vacuum but its illicit economy extends to hawalas, TBML, direct financing of armed groups and human rights abuses, and creates ripple effects that are transnational in scale.

The value density of gold refers to its compact size as a monetary vehicle. Demand for gold is worldwide, and it is bought by individuals, industry, and government as a store of value. To either satisfy the demand of nefarious actors or integrate illicitly sourced gold into the legitimate operational supply, its value density allows it to be

inconspicuously smuggled in comparison to bulk cash, and its demand-driven liquidity allows it to be easily sold.

The anonymity of gold also makes it an attractive value storage and transfer mechanism. Supreme difficulty arises in ascertaining the exact source of raw gold and gold doré, truthful receipts of sourcing and sale can be easily manipulated to obscure transfers, and its elemental properties allow it to be easily recast and recycled to obscure a sometimes suspect vehicle of threat finance.

Gold's potential for exploitation has horrific results on entire regions. Often mined in developing nations that sometimes lack the very basic functions of governance, armed groups can tax subsistence miners or even wrest control of mining operations as a source of fundraising. The absence of armed groups does not even grant immunity from exploitation; miners can work in grossly unsafe conditions, debt servitude can be the standard, sex workers can be trafficked to meet the demand in ad hoc mining encampments, devastating environmental impacts from toxic chemicals are likely, and developing governments are deprived of greatly needed tax revenue that could be used for investment in society and infrastructure.

The transnational legitimate operational chain needs proper regulation and oversight to avoid the pervasive effects of abuse. On a national scale, policy needs to address the precursor environments and methodologies of exploitation. On an international scale, the FATF and FATF-style regional bodies (FSRB), which provide their recommendations on anti-money laundering and combating the financing of terrorism (AML/CFT), need to address these same fundamental vulnerabilities to protect the integrity of financial systems and standardize countermeasures.

B. SCOPE

This thesis discusses gold's operational chain from miner to market and the vulnerabilities at the intersection of illicit activities and the legitimate. While there are definite intersections between the financial misuse of gold and other threat finance methodologies, this thesis only gives casual mention to these other aspects and only

delves further into their symbiosis when necessary to illustrate the full impacts relevant to the CTF analyst.

Illicit operations are not merely limited to VEOs, TCOs, and other armed groups for the purposes of this thesis. The greater economic impacts of illicit gold economies require an examination of illegal mining activity and black markets that are not necessarily directly tied to violent organizations or criminal enterprises. As an example, high demand and tariffs in Region A could lead to purchasing gold smuggled from Region B, which in turn could be gold that was sourced from Region C at a mine operated by informal subsistence miners. The illicit economy in Region C could then lead to human trafficking from Region D. In other words, declaring that the buyer in Region A is outside of the scope as they are not part of a nefarious organization would then overlook the contribution of demand in Region A to the ongoing issue of human trafficking in Region D.

This thesis also focuses on proactive operational and policy choices for countering the illicit operational chain. The FATF and FSRBs are intergovernmental organizations (IGOs) comprised of member states or jurisdictions creating formal networks to address and make recommendations on AML/CFT best practices. While these networks play an important role, the actual benefits reside within the ties produced between actors within these networks. Scalable ties between members based on network co-membership can be used to better understand the placement and effectiveness of actors within the FATF/FSRB aggregate network through social network analysis (SNA). Many IGOs and entities like the United Nations (U.N.), the World Bank, and the International Monetary Fund (IMF) are excluded from this analysis because of AML/CFT being an ancillary function and their almost universal membership that does not always accurately reflect the nuances of regional, religious, ethnically, historically, or culturally shared experiences that can add resiliency and strength to ties. The Egmont Group is also excluded because of its similarly large membership and because it is based off of financial intelligence unit (FIU) cooperation that is generally more operationally focused towards reaction instead of proactive policy. A more explicit discussion of the network boundaries is detailed in Chapter V.

C. CTF LITERATURE REVIEW

A large collection of literature exists on the CTF subject published by governments, IGOs, academics, authors outside of academia, and open source reports. As interest in the operational utility of CTF and the awareness of its necessity in providing stability has grown, knowledge acquired in this field is continuously disseminated. The literature is in large part divided into the categories of individual mechanisms by which money is laundered and methodologies for value transfer between individuals or groups, best practices for identifying and restricting the ability for these transfers, and government and state responses in the CTF realm. This literature review serves as an introduction to material published in the general field of CTF on commodity based money laundering, TBML, and state responses.

1. U.S. Government CTF Publications

The 9/11 Commission Report, published in 2004 by the National Commission on Terrorist Attacks upon the United States, serves as an excellent primer to the raw need for threat finance intelligence and CTF. This bipartisan report provides a narrative for the events preceding 9/11, the terrorist attacks themselves, and responses to the attacks prior to offering recommendations for future reorganization to combat the terrorist threat. While this report does not focus on the pantheon of terrorist financing, it does offer insight into the funding mechanisms of bin Laden and Al-Qaeda (AQ). The most relevant portions come from the diversity of funding sources, transfer mechanisms, and potential governmental complicity. AQ used zakat—a pillar of Islam with the requirement for charitable giving- to draw a large quantity of funds for the organization, a network of hawalas to transfer money, and safe havens in Sudan and Afghanistan to operate. Additionally, the report touches on the allegations of AQ dealing in blood diamonds as a store of value but states that there is no “persuasive evidence” (Kean & Hamilton, 2004, pp. 169–171).

The Office of Terrorism and Financial Intelligence under the U.S. Department of the Treasury leads the U.S. delegation to the FATF (“Financial Action Task Force,” n.d.). While the U.S. is the most central state actor in the FATF, the Department of the

Treasury also issues reports on findings and best practices in regard to AML/CFT. The Treasury's latest National Terrorist Financing Risk Assessment from June 12, 2015 gives an overview of the myriad threats posed by terrorist financing and general exploitation of the U.S. financial sector (Department of the Treasury, 2015). In this report, mostly traditional sources of illicit financing are highlighted in addition to interagency and international CTF efforts, but a brief description of successful prosecution against a gold-backed virtual currency exchange, Liberty Reserve, is given (Department of the Treasury, 2015, p. 58). This virtual currency case shows the intersection between fiat, commodity, and virtual currencies and the international nature of illicit financing.

U.S. Immigration and Customs Enforcement (ICE) under the Department of Homeland Security has periodically been publishing "The Cornerstone Report" since 2003. Sharing its title with the ICE financial investigation program of the same name, Cornerstone provides case overviews and highlights vulnerabilities to the U.S. financial sector. Volume I, Number 3 from July, 2004 addresses "Operation Meltdown," in which a black market peso exchange scheme was importing gold bullion to the United States, purchasing the bullion with drug profits, melting it down at U.S. jewelers into innocuous items like nuts and bolts, and exporting the gold to Columbia for resale at its gold value (Immigration and Customs Enforcement, 2004). Not only does this further explain the crossover of TBML, international threat finance, and commodity exploitation, but it also illustrates the importance of U.S. government literature to the interagency as it provides readily available source material to educate the CTF community and provide red flag indicators.

2. IGO and Non-governmental Organizations

The FATF publishes typology reports, shared case information, best practices papers, and trend reports in addition to their recommendations (Financial Action Task Force [FATF], 2012). The Report on Money Laundering Typologies 2002–2003 details the exploitation of the gold and diamond commodities sectors to enable the laundering of illicit funds. It gives anonymized examples of international laundering schemes regarding these commodities, areas prone to exploitation, and rationales for nefarious actors to be

inclined to engage in the gold and diamond markets (FATF, 2003). FATF reporting is essential because of its international forum and ability to disseminate pertinent information for the protection of financial sectors and national economies.

The World Gold Council (WGC) is a market development agency comprised of 18 mining companies operating on all continents except for Antarctica (“Our Members,” n.d.). One of their products is the Conflict-Free Gold Standard, which addresses responsible mining that does not support unlawful armed conflict, protects human rights, encourages economic development, and promotes transparency in dealings with host governments to lessen the effects of corruption (World Gold Council [WGC], 2012). This independent standard of implementation serves to illustrate industry efforts to maintain compliance with international efforts and acknowledge the effects of mining on corruption, kleptocracy, conflict support, and human rights.

3. Academic

Terrorism Financing and State Responses offers a collection of terrorism financing resource literature defining the trade space in which nefarious organizations choose to make financing decisions and the CTF environment that combats this threat. While focusing mainly on religiously motivated terrorist groups but still taking into account the lessons learned from criminal enterprises, the authors offer insight on a range of issues from terrorism financing intelligence, CTF tradecraft, and emergent threats to efficacy of response in a variety of regions and the legislative policy environment used to restrain the threat (Giraldo & Trinkunas, 2007). Anne Clunan discusses international CTF efforts including those of the FATF, the origins of the 40 recommendations in U.S. and British anti-money laundering standards (Clunan, 2007, p. 265), the policy environment that has grown from it, and ultimately that true acceptance of CTF legislative standards comes reactively after a terrorist attack (Clunan, 2007, p. 263).

Martin Meredith’s tome, *The Fate of Africa*, offers a historical political narrative to the African continent since the era of decolonization in the 1960s. While never suggested to be a monograph on threat finance, the effects of exploitation and chronic corruption are made explicitly clear. The role of conflict resources and corruption are

examined through the 1970s kleptocratic regime of the Central African Republic leader Jean-Bedel Bokassa, detailed by a \$22 million coronation; Liberia and Sierra Leone, conflict diamonds and corrupt leadership fueling persistent instability; Zimbabwe's Robert Mugabe, allegedly sanctioning forced labor in 2008 for diamond extraction; Rwandan activity in the Democratic Republic of the Congo, operation of massive resource exploitation in gold, diamonds, and coltan; and other corrupt and kleptocratic leaders and states (Meredith, 2011, pp. 228, 561–562, 652, 540). Meredith's contribution to CTF lies in the detailed discussion of state level corruption and the compounding effects wrought on regional stability.

Louise Shelley focuses on the interrelations between crime, corruption, and terrorism in her book *Dirty Entanglements*. She uses multiple case studies of terrorist attacks to describe the environments in which terrorism and transnational crime can flourish and the benefits of terrorist diversification into the criminal sector. Discussing the myriad ways of obtaining financing, Shelley describes the adoption of legitimate business techniques by terrorist organizations and their use of geographic competitive advantage in determining financing methodologies and supply routes (Shelley, 2014, p. 201). She points towards South America and Africa as being regions of resource exploitation concern because of these natural advantages and the follow-on role, learned from organized crime, that corruption plays in further movements of these commodities (Shelley, 2014, p. 201).

Cassara and Jorisch discuss the role of gold and diamonds in CTF and financial sector security in their book *On the Trail of Terror Finance*. As a CTF primer for law enforcement and the intelligence community, they propose a series of questions for investigators to use to assess the laundering risk of gold dealers, the role of gold in hawalas, and the myriad of threats that this commodity poses in illicit financing (Cassara & Jorisch, 2010, pp. 91–102). One of the larger contributions made by Cassara is the Trade Transparency Unit (TTU) concept that is now used in the United States by organizations such as ICE. The purpose of TTUs reside in their functions as a countermeasure to illicit trade and financing by analyzing trade data looking for

irregularities in import/export levels that could be indicative of TBML (Cassara & Jorisch, 2010, p. 68).

4. Independent Reporting and Open Source

Formerly the *Washington Post*'s West Africa bureau chief in the Ivory Coast from 2000–2001, Douglas Farah broke a 2001 story of AQ dealing in blood diamonds within the network of Charles Taylor and the Revolutionary United Front (RUF) (Farah, 2001). The claims of AQ's linkages to the blood diamond trade is disputed in the 9/11 Commission Report (Kean & Hamilton, 2004, p. 171), but despite the veracity of the explicit claims of sources involved, the overarching narrative of the network mechanisms of resource exploitation and masking funds in Sierra Leone and Liberia is unmatched in its level of detail. Farah's experiences in West Africa are further detailed in his 2004 book, *Blood From Stones*, which discusses the route of uncut conflict stones from the RUF controlled diamond fields of Sierra Leone to European markets and the required complicity of government officials (Farah, 2004). Farah also describes in this book the capital flight in gold ingots from Afghanistan to Dubai in 2001, the preference of hawaladars to utilize gold as a cash settlement method, and the entanglement of the Emirati gold markets (souks) and criminal elements across the Indian subcontinent (Farah, 2004, pp. 108–124).

Dubai has also been noted for its centrality in the 9/11 attacks (Kean & Hamilton, 2004), large quantity of hawaladars based out of its gold souks (O'Brien, 2003), generally unregulated informal banking sector (Central Intelligence Agency [CIA], 2015d), importing and refining smuggled Congolese conflict gold (Bariyo, Freeman, & Plevin, 2013), misrepresented gold imports (Fitch, 2014), and potential links to organized crime on the Indian subcontinent (Farah, 2006). Despite significant legislative efforts by the Central Bank of the U.A.E. and the establishment of the DMCC to provide regulation and infrastructure for the Dubai commodities market, Dubai maintains a significant role in terror financing and the processing and transshipment of conflict gold.

D. SNA LITERATURE REVIEW

This section discusses SNA and its application to analyzing the networks created by actor membership in FATF/FSRB organizations. Previous work in the field serves to provide theory, context, and a foundation for future literature in its multiple applications.

Observer status in membership networks creates weak ties between actors that lend to connections between various portions of the aggregate network, and Granovetter (1973) argues that weak ties serve as bridges that enable the diffusion process. Weak ties assist in the speed of information dissemination and can reduce the path distance between actors compared to a network that only has strong ties. This is postulated on the assumption that actors with a weak tie tend to have different actors in their ego networks and thereby the weak ties create bridges in the network.

Burt's (1992) theorem on structural holes builds on the work of Granovetter. He argues that Granovetter's weak ties serve to bridge structural holes in the network and put actors who control the gap spanning ties in a brokerage role (Everton, 2012, p. 254). Burt describes these structural holes as acting like an insulator with non-redundant contacts providing connection in this network (Burt, 1992, p. 65). In building aggregate network resilience, the theory regarding structural holes is important as redundancy of ties is beneficial as no one actor should be in a position of structural brokerage as they can influence network actions.

In the macro policy network environment, strong ties (full membership) reflect national self-determination to associate with others in that network. In his case study of a west coast firm, Krackhardt argues, "Strong ties constitute a base of trust that can reduce resistance and provide comfort in the face of uncertainty (Krackhardt, 1992, p. 218)." While not discounting the role that Granovetter's weak ties play, Krackhardt shows on a micro level the structural strength and tendencies afforded by the strong ties in times of crisis. Krackhardt concludes by saying that "philos" (friend) relations are foundational during times of major change because "change is the product of strong, affective, and time-honored relationships (Krackhardt, 1992, p. 238)."

Underlying network structures in the aggregate exist beyond simple FATF/FSRB membership. Klerks, an academic with the Dutch National Police Academy, wrote about the value of network analysis in understanding criminal organizations (Klerks, 2001). His work centers on the understanding of criminal organizations as organic networks rather than strict hierarchical structures that are often popular in law enforcement. An enduring element to his argument for network analysis in understanding criminal organizations can likewise be applied to the analysis of bright networks; “Social network analysis not only draws attention to established contacts, but also to relationships to appear not to exist and are oddly missing (Klerks, 2001, p. 62).”

Network diameter and closeness between actors is also important for the effects related to the spread of influence and the effects of the network on the actor. Christakis’s and Fowler’s (2009) discussion on network rules include concepts of how actors seek out others that are alike, how position in the network shapes the actor, the role of adjacent actors in shaping the subject actor, how actors are influenced by those separated as far away as three degrees (“friends’ friends’ friends”), and how network properties affect the individual (Christakis & Fowler, 2009, pp. 17–26). Their addendum to Stanley Milgram’s (1967) six degrees of separation, that every actor is linked to another actor through six degrees, says that all actors are influenced by those up to three degrees away after which influence dies out similar to the energy dissipation of a spreading wave (Christakis & Fowler, 2009, p. 28).

E. METHODOLOGY AND DATA SOURCES

The methodology of this thesis is broken into four main parts: gold’s operational chain from miner to market, AML/CFT policy, SNA of the FATF/FSRB aggregate network, and proactive operational strategies and policies that can be applied. Out of these four segments, SNA is unique in its intensive application of the social sciences, the description of the operational chain and policy are both qualitative and quantitative in their research intensive approaches, and the strategy and policy recommendations serve as the findings based off of the previous work conducted.

1. Operational Chain and AML/CFT Policy Methodology and Data Sources

The first requirement to describe the applications of gold to threat financing is to describe the parallel illicit and legitimate operational chains. This gives insight into the fundamental operations and allows for a discussion of the generic vulnerabilities encountered at all levels. This section draws heavily on publications from the Organisation for Economic Co-operation and Development (OECD), major markets like the Dubai Multi Commodities Center (DMCC) and the London Bullion Market Association (LBMA), and industry groups like the World Gold Council (WGC).

After a general presentation of the operational chain, a narrative of specific regional examples is given to illustrate the impacts of illicit economies and the transnational threats they create. This second part focuses on the environments whether political, social, or economic, the threat financing methods used, the actors who employ these methods, and the markets that can be infiltrated by illicit commodities. This section is diverse in its information sources and draws on publications from three of the “Big Four” auditing firms, U.N. expert panels, IGOs, non-governmental organizations (NGO), and independent reporting. Immense value is contributed from independent reporting as it often gives a hyper-focused view of individual issues and an on-the-ground perspective that is sometimes not available to larger and more formal organizations. Sometimes inaccuracy is a risk in independent reporting and therefore multiple sources are often cross-referenced to ascertain competing claims to the greatest extent possible.

Policy is the third section with a heavy research methodology. This section offers a sample of national level policies aimed at maintaining the integrity of the financial sector as it pertains to gold and of IGO recommendations. This section is research focused and includes legislation and central bank regulations. This bridges the divide between specific operations and state responses to a transnational issue.

2. SNA Methodology and Data Sources

The purpose of Chapter V is to use SNA to better inform strategies of enhancing network resilience and policy targeting within the aggregate FATF/FSRB network. Sean Everton (2012, p. 5) describes SNA as, “a collection of theories and methods that assumes that the behavior of actors (whether individuals, groups, or organizations) is profoundly affected by their ties to others and the networks in which they are embedded.”

An examination of the macro (state/jurisdiction) level network created by the FATF/FSRBs leads to an illumination of the underlying structures and identifies interactions that can be leveraged to direct the introduction and efficient targeting of policy. Identification of the underlying structures can also be utilized to identify problematic actors in the network and issues that affect network resilience. A more in-depth discussion of SNA methodology is included in Chapter V to give more granularity and collocate the analysis’s processes with the results.

The dataset compiled for this chapter is a membership network of 212 states and jurisdictions and is presented with sources and an in-depth explanation in the Appendix. The term “membership network” means that the compiled network reflects 212 states’ or jurisdictions’ individual participation in one of the nine FATF/FSRB networks. When this dataset is “folded,” thereby turning actor-by-organization networks into an aggregated actor-by-actor network, ties are now established between states or jurisdictions. This reflects the understanding that membership in a single network creates ties between all actors within the network because voluntary membership is a conscious decision reflecting an underlying reason to be a network member (Everton, 2012, p. 86).

The primary source of data is the FATF website’s list of country membership in the FATF or FSRBs (“Countries,” n.d., data included in table). This provides three statuses of affiliation: “member,” “observer,” or “other.” Occasionally, this list is not current so individual FSRB websites are consulted for an accurate list of membership. However extensive this list seems, it is not all inclusive of the international community. As an example, the Islamic Republic of Iran is included in the FATF’s regional body matrix despite no status in any organization; but other nations such as Chad, Cameroon,

the Central African Republic, Republic of the Congo, and the Democratic Republic of the Congo are excluded. These nations are at high risk for the movement of illicit funds due to poor governance and are equally important to include in the aggregate network.

The World Bank is another intergovernmental organization with responsibilities to the security of the international financial sector and its resilience. The World Bank periodically publishes a ranking of nation-states' and certain sub-state entities' gross domestic products (GDP). Data from the document on April 14, 2015 was also included to expand the network of actors (World Bank, 2015b). This dataset also contributes valuable attribute data to enable the visualization of network membership combined with economic data.

Despite the volume of data included in the World Bank's report, GDP data was not covered for all FATF/FSRB jurisdictions and some nations did not report data. For the 19 nations/jurisdictions that did not have data reported to the World Bank, the most recent information was instead pulled from the CIA's *The World Factbook*. It should be noted that the Holy See (Vatican City) does not have a GDP listed in the data set ultimately compiled because of exclusion from both World Bank and CIA resources and taking data from a third source for a single actor would also be unnecessary because of the small economic size.

II. THE OPERATIONAL CHAIN

In 2003, the U.S. General Accounting Office (GAO) published a report on threat financing and the use of alternative remittance systems in which they identified gold as being a method for moving and storing value, but not earning value (GAO, 2003, p. 10). While gold may often be used to settle account balances among hawaladars, transfer value outside government oversight of the formal financial sector, and obscure the money trail (Cassara & Jorisch, 2010, pp. 98–101), it must not be overlooked that the sourcing of gold can represent a means to earn value for nefarious groups or individuals.

This chapter explores the supply chain of gold from mining operations through placement on the large international markets or sale to the purchaser. Throughout the supply chain, opportunities exist for illicitly sourced gold to be integrated into the legitimate supply, directly earn value for groups utilizing substandard or forced labor practices, or indirectly fund groups through illicit taxation and corruption.

A. UPSTREAM OPERATIONS

The origin of commodities in threat financing is the initial point at which value can be gained. The OECD cites three sources for gold: mining, recycling, and grandfathered stocks (OECD, 2013, pp. 67–68). All three sources hold a degree of significance to the CTF analyst but mining and recycling are the two primary methods of generating value. Grandfathered stocks primarily are a concern to larger bullion markets and their efforts to ensure a conflict-free origin of the marketed commodity. This section focuses on the upstream operations –processes from mining to refining– of both legitimate and illicit gold production (OECD, 2013, p. 70).

1. Legitimate Upstream Operations

There is a vacuity of a universal definition of a legitimate mining operation; for the purposes of this thesis it should be assumed that a legitimate operation is one that complies with international human rights legislation, maintains oversight on the processes throughout its supply chain, is not assisting in the prolonging of illegal armed

conflict, and is not intentionally evading state regulations (OECD, 2013, pp. 20–24; WGC, 2012, p. 10). This subsection focuses on legitimate mining and refining operations while identifying select points where corruption and illegal practices affect its integrity.

a. Legitimate Mining

PricewaterhouseCoopers (2013a, p. 1) estimated that in 2012 around 66% of the 4,477 metric tons of gold produced came from mined sources while the other approximately 33% came from recycled gold. From this, the total gross value added from production by the top 15 gold producing countries alone was estimated around U.S. \$78.4 billion (PricewaterhouseCoopers [PwC], 2013a, p. 1). This total represents the production of mainly medium and large scale mines (LSM) and, to a far lesser extent, some artisanal and small-scale mines (ASM).

The OECD defines ASM by their small scale and often labor intensive extraction processes. Alluvial deposits (surface deposits embedded in sand or gravel) are often exploited in streams, rivers, and areas abandoned by LSM where remnants of former deposits are now more accessible (OECD, 2013, p. 67). LSM by the OECD definition refers to any mining operation that is not considered to be ASM and uses far more sophisticated extraction processes enabling a larger output (OECD, 2013, pp. 65, 67).

Focusing on the contributions of LSM to the total output of legitimate and regulated mining operations, open-pit and underground mines are the two primary mechanisms used. Open-pit mining utilizes a series of steps blasted into rock from which gold-bearing ore and waste are segregated and then hauled away for initial processing. Underground mining utilizes a series of shafts and tunnels to exploit deposits deeper underground before ore and waste can be segregated before processing (“Mining,” n.d., Underground mines section). After mining, ore is processed and gold is extracted most often through the practices of cyanidation or floatation. The output of these initial processes is gold doré (85%-90% purity), which is then sent to a refinery for further processing (“Mining,” n.d., Cyanidation section; OECD, 2013, p. 67).

In the early phases of mining and initial refinement, financing of illicit activity by legitimate mining operations generally comes in the form of corruption by government

officials or illegal taxation assessed by non-state groups (OECD, 2013, p. 71). Another possible weakness in this phase is when initial processing of gold-bearing ore occurs at a location outside the mines area of control (WGC, 2012, p. 4). In this case, it is not necessarily evident that ore contains gold or other valuable elements and avoidance or evasion of tariffs may occur by the company or individual actors seeking to make financial gain (WGC, 2012, pp. 28–29).

b. Legitimate Refining

Dependent on geography and infrastructure, gold doré may be produced either by the mine on-site or at separate refineries (WGC, 2012, p. 28). Following arrival at the refinery, gold doré is then refined from its initial 85%-90% purity to a purity of 99.5% or higher depending on its planned end state purposes (“Refining,” n.d.). After this point, the refined gold then enters the downstream chain as it moves to the market.

The highly alterable nature of elemental gold causes refining to be one of the intersections where illicitly-sourced gold can be integrated into the legitimately-sourced pipeline. Initiatives such as the Conflict-Free Gold Standard intend to codify due diligence procedures among mining operations to ensure the integrity of the upstream supply chain, but refiners should also ensure that sourced gold doré comes from legitimate mining operations (WGC, 2012, p. 30). Refiners are also susceptible to bribery in order to conceal the origin of gold being refined, invoice manipulation, and general product misrepresentation (Cassara & Jorisch, 2010, pp. 98–99; OECD, 2013, p. 71).

2. Illicit Upstream Operations

Illicit upstream operations may be more easily defined as they contain the inverse characteristics of legitimate operations and generally disregards sanctions, rule of law, human rights, and may serve to fund and enable the continuation of illegal conflict (OECD, 2013, pp. 20–24; WGC, 2012, p. 10). This subsection focuses on illicit ASM, its characteristics, and its impact on the integrity of the supply chain.

a. Illicit Mining

All ASM operations are not illicit but ASM is more likely to be an indicator of illegal activity. PwC summarizes the potential benefits and economic impact of ASM operations “particularly in low income and Highly Indebted Poor Countries” but also acknowledges that “the sector faces some key challenges, including weak controls and regulations, poor social and environmental practices, the use of child labour and smuggling of gold involving criminal networks” (PwC, 2013a, p. 17). Even though ASM operations may be a readily available source of employment in impoverished areas and have a positive economic impact, monitoring for substandard conditions must be maintained and ASM must serve as a risk factor for illicit financing.

As previously discussed, a characteristic of ASM is its low technological methods and small scale (OECD, 2013). The low level of investment required to start an operation leads to choosing areas that are economically viable without the use of heavy machinery and on-site infrastructure like processing facilities for the production of gold doré. Alluvial gold mining, being a cheap and readily accessible source that can be conducted without infrastructure, serves as a high risk indicator for potentially illegally sourced gold (FATF, 2008, p. 24).

A common method of initial extraction of gold from the silt of alluvial mining or milled ore is mercury amalgamation. In this process mercury is mixed with a gold-containing silt or slurry, the amalgam is then strained through a cloth to further remove impurities, and the resultant ball of mercury gold amalgam is approximately 80% mercury by weight and 20% precious metal (Blacksmith Institute, 2010). After the amalgam is obtained it is heated with a blowtorch or in an open flame oven to vaporize the mercury and leave the gold particles behind (“Artisanal Gold Mining,” n.d., Description section, para. 2). Gold cyanidation may be used instead of mercury amalgamation or as an additional method to further extract particles from the waste product. In this process, the silt or slurry is mixed with cyanide forming a water soluble compound and then zinc is added to extract the gold (Blacksmith Institute, 2010; “Mining,” n.d., Cyanidation section).

The adverse effects upon the health of mine workers and the environment are readily apparent. Workers often have no respiratory or skin protection suitable to guard against the effects of mercury vapors and waste products of both processes are commonly released directly into the environment.

ASM is not a substitute term for illicit mining practices but the low investment, readily available sources, and ease of starting an operation without drawing attention to lack of regulations in force loans itself to being easily exploited by nefarious groups. The small quantities processed on site can also easily be integrated into other stocks of legitimately mined gold or smuggled across borders to obscure its origin (OECD, 2013, p. 71).

b. Illicit Refining

Refining of the processed gold from illicitly mined sources does not differ from the processes of legitimate operations. The products of mercury amalgamation or gold cyanidation may have a similar purity to gold doré but the ease of transport of an ASM's product versus the large quantities produced by LSM are the differentiating factor in how easily the product can be integrated into legitimate supply chains.

An ASM with extremely lax regulation sits in the Peruvian Andes in the village of La Rinconada at approximately 16,700 feet above sea level ("La Rinconada, Peru," n.d., Elevation in right margin). In these mines, payment comes in the form of cachorro in which no official wage is paid by the company but instead workers can pocket all the gold-bearing ore they can carry on one day per month (Finnegan, 2015; Verité, 2012). These miners in turn take the gold flake they have to a middleman who pays a rate off of the daily spot price, melts the week's take into doré, and then smuggles the product on foot across the border into La Paz, Bolivia for Bolivian and Brazilian buyers (Finnegan, 2015).

While the ASM operations in La Rinconada may have disputable levels of legitimacy, lax regulation and substandard wage practices contribute to avenues where a legitimate product may be diverted to unknown buyers. These buyers knowingly engage

in illegal smuggling practices and then integrate the product into the greater gold supply, possibly using the proceeds off of a bargain purchase for further criminal activities.

B. DOWNSTREAM OPERATIONS

Downstream operations refer to the second portion of the operational chain, from refiner to end user (OECD, 2013, p. 70). At this point in the operational chain, onus is often placed on the retailer or bullion market to ensure legitimacy of the gold source whether it is from a bullion refiner or an individual seller of bullion or other gold vehicle.

1. Legitimate Downstream Operations

The legitimate world demand for gold in 2012 stood at 3,611 tons with jewelry, investment, and official sector purchases accounting for approximately 90% of the demand (PwC, 2013a, pp.27, 29). This subsection focuses primarily on describing the market in two locations through the LBMA and the DMCC.

a. LBMA

London is the largest market for gold bullion and the LBMA regulates the Good Delivery List, wholly owns Precious Metals Prices Ltd which sets the twice daily London spot price, and published the Responsible Gold Guidance (RGG) which accredits refiners as having sufficient quality in their product and ensures that they have met responsible source criteria (LBMA, 2015, pp. 2–4). The services offered and functions conducted by the LBMA and its participating members include over the counter (OTC) trades between individual investors or central banks, vaulting services for traded gold, clearing and settling of accounts through paper transfers in order to not have to transfer physical metal, and the setting of spot prices in U.S. dollars (“The London Bullion Market,” n.d.).

The Good Delivery bar is the highest standard for bullion and is the common unit of trade on the LBMA. Allowed to specified tolerances, the Good Delivery bar is generally 400 troy ounces in weight with a minimum 995.0 parts per thousand fine gold (“Good Delivery Rules,” n.d., Specifications for a good delivery gold bar section). Refiners are certified for production and allowed to supply the LBMA after meeting certain criteria including five years in operation, a minimum 10 tons annual production,

£15 million net worth, and adherence to the RGG (LBMA, n.d.). These controls require third party audits of both refining processes and adherence to due diligence sourcing requirements and know your customer (KYC) regulatory compliance (LBMA, 2015, p. 4).

In the London OTC market, the Market Makers conduct the transactions on behalf of their clients with the five full members (ability to sell spots, forwards, and options) being Barclays Bank Plc, Goldman Sachs International, HSBC Bank USA NA, JP Morgan Chase Bank, and UBS AG while an additional nine Market Makers without the ability to sell all three products include members such as Citibank NA, Credit Suisse, and Deutsche Bank AG (“Membership,” n.d., Market-making members section). The minimum transaction size is 1,000 troy ounces of gold creating frequent sizable transactions (LBMA, 2008, p. 5).

Opportunities for illicit financing on this major market come in two forms: refiners’ sourcing and customers’ objectives. While responsible sourcing guidance is in place through the LBMA RGG in accordance with the OECD due diligence guidance, it is still possible for illegally sourced gold to be integrated into the legitimate supply chain at some refiners because of the sheer quantity of gold being refined (LBMA, 2015, p. 4). The second threat of customers’ objectives is partially mitigated through KYC regulations but storing and transferring illicit funds is possible when banks are not able to catch evidence of possible red flags.

b. DMCC

The DMCC is a Government of Dubai strategic initiative founded in 2002 to regulate and encourage growth in the Dubai commodities market through infrastructure management (“DMCC—Who We Are,” n.d., Who we are section). In 2011, 754 tons of gold was imported into Dubai and the sum value of imports and exports totaled approximately U.S. \$56 billion, solidifying Dubai as the largest gold market in the Middle East (“Dubai Gold Trade Statistics,” n.d.).

The DMCC has also created the Dubai Good Delivery (DGD) to its own specifications of 995 parts per thousand fine gold with a standard weight of 1 kg within

specified tolerances (“Accreditation Initiatives,” n.d., About DGD section). The DGD list is similar to the one produced by London in that it specifies accredited refiners and requires compliance to quality standards and responsible sourcing guidelines.

The DMCC has majority ownership of the Dubai Gold & Commodities Exchange (DGCX). The DGCX offers clients the ability to trade in gold futures and across a range of other commodities including hydrocarbons, silver, and copper. This commodities exchange benefits from Emirati market regulations, the transnational business environment of Dubai, and the geographical situation of Dubai between the markets of Europe and Asia (“About DGCX,” n.d., Benefits of trading on DGCX section).

The DMCC has implemented the OECD due diligence guidance and requires participating refineries to adhere to these risk based countermeasures (DMCC, 2012, p. 1). The DMCC’s guidance is comparable to the LBMA RGG as both are based off of the OECD’s five-step guidance, require risk identification, risk response, and third-party auditing (SGS United Kingdom Ltd, 2014, pp. 7, 16–17).

Opportunities for illicit financing through the DMCC and the DGCX are very similar to the LBMA. Due diligence processes mandated by market regulations are only as strong as the due diligence by the upstream operations of the refiners and miners. KYC regulations, AML/CFT regulations, and willingness of the government to prosecute violators remain the key mechanisms to maintain market legitimacy.

Third-party audit compliance mandated by the DMCC’s guidance has had its successes. In May, 2015, Al Kaloti Jewellers Factory LTD was delisted from the DGD list for failures in responsible sourcing compliance (DMCC, 2015; McAuley, 2015). While responsible sourcing policies and accreditation mechanisms for large markets incentivize transparency, large throughput at both individual companies and the Dubai commodities market make enforcement difficult.

2. Illicit Downstream Operations

This subsection focuses on illicit operations from the refiner to the end user by highlighting small smuggling operations and gold recycling. The OECD guidance refers

to recycled gold as taking an unprocessed form—returned gold products to the refiner, melted gold—gold products that have been melted into gold stock by the refiner, or industrial byproduct—gold that is a secondary output from the mining of another metal (OECD, 2013, p. 68). It should be noted that recycled gold products are not illegal and represented 36% of sourced gold in 2012 (PwC, 2013a, p. 4), but it is a potential weakness in downstream operations that could be used to transfer value and obscure the financial trail.

a. Smuggling

The weight and mutability of gold makes it an excellent vehicle to discreetly transport value. At a July 29, 2015 approximate spot price of U.S. \$1,100 per troy ounce, a one kg bar of 0.995 fineness gold is worth over U.S. \$35,000. This illustrates the ease in which couriers can smuggle bullion compared to cash. Further benefitting the smuggler, the spot prices are easily accessible, demand is always present, and gold is immune to inflationary pressures present in unstable economies when smuggling bulk cash (Cassara & Jorisch, 2010, pp. 92–96).

Farah (2002) documented the allegation that the Taliban used gold to smuggle assets out of Afghanistan to Karachi, Pakistan in late 2001 in order to move assets away from coalition forces. Estimated at U.S. \$10 million in a three week period, this gold was then further smuggled or exchanged through hawalas where funds were then obscured in the greater Dubai market (Farah, 2002). This quantity is relatively easy to move with porous borders and ineffective governance. The relationship between gold and hawala should also be noted in downstream operations as gold smuggling can be used to balance accounts between hawaladars (Cassara & Jorisch, 2010, pp. 100–101).

In the Dubai market, an Ernst and Young (EY) whistleblower conducting a third-party audit of Kaloti found multiple problems in their sourcing. On the DGD list since February, 2010 (DMCC, 2015), Kaloti was found to have made U.S. \$5.2 billion in payments without documentation, imported four tons of gold into the U.A.E. that was spray-painted silver to avoid scrutiny, and allegedly was conflict sourced from the Democratic Republic of the Congo (Verity, 2014). Eventually delisted from the DGD in

2015, this case of smuggled commodities from a listed and previously vetted organization shows the extent to which gold can be brazenly smuggled into a large market.

India, the largest consumer of gold (PwC, 2013a, p. 29), has seen a surge in smuggled gold being imported. To avoid customs and import tariffs on the precious metal, smugglers have begun recasting the metal into objects like belt buckles and flashlight batteries (Ray, 2014). The primary rationale for smuggling gold into India may be tax avoidance but the ease and inventiveness of smugglers should peak the awareness of CTF analysts.

b. Recycled Gold

Gold recycling is another point at which illicit funds may be integrated into the legitimate supply. By receiving finished gold products and reprocessing them for future sale to industry, investors, or jewelers, the origin is obscured and anonymity of the participants is secured. While recycled gold represents an approximate one-third share of sourced gold (PwC, 2013a, p. 4), there is a high level of risk in this market.

The OECD guidance recommends consistency in a risk-based approach for recyclers, adherence to KYC regulations, and adoption of an accounting system to match inputs to outputs (OECD, 2013, pp. 86–96). The myriad of sources and suppliers of legitimate recycled gold can easily allow the integration of smuggled and illicitly sourced metal. The product can contain multiple origins that become more difficult to ascertain as it flows from recyclers to refiners and back to the market with potentially inadequate due diligence processes (OECD, 2013, p. 71).

C. SUMMARY

The gold supply chain from source to ultimate consumer contains numerous independent entities each with their own inherent vulnerabilities. The operational chain provides opportunities to generate, store, and transfer value for nefarious actors and contribute to the perpetuation of conflict. Industry groups and regulatory bodies have worked towards mitigating these risks through due diligence guidelines and licensing of market participants but abuses are still bound to occur in such a large market.

Chapter III builds upon the foundations of the operational chain in this chapter. By presenting regional threats of illicit financing utilizing gold, gaps in policy and red-flags for abuses may be illuminated.

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III. REGIONAL THREATS

Gold is a crucial part of state level financial policy, a mechanism of investment for many banks and individuals, and a show of wealth and status in most parts of the world. While policies and regulations are set in place to protect the integrity of these markets, integration of illicitly sourced gold into legitimate supplies and the store of value in a generally anonymous commodity by nefarious groups prove to be salient threats.

Felbab-Brown (2010, pp. 175–177) discusses three contributing factors to the formation and continuing operation of illicit economies: the provision of an ungoverned space, governments that are unwilling or unable to stop the illicit activities, and an existing demand for the product. This chapter discusses regional threats emanating from some of these ungoverned or under-governed spaces. While this chapter is not all inclusive in its presentation of where illicit markets operate, it does serve to relate the illicit market operations discussed in the previous chapter to specific regional occurrences.

A. AFRICA

This section discusses the upstream operations in the Democratic Republic of the Congo (DRC) and the Central African Republic (CAR). Situated in the African Great Lakes Region (“About the Great Lakes Region,” n.d.), the DRC has been noted as a hotbed of instability with warring factions controlling mines, taxing miners and smugglers, and directly conducting a myriad of human rights abuses (CIA, 2015b). In the eastern DRC, South Kivu is a major center for this activity and as much as 50% of the DRC’s gold production comes from here (The Enough Project [Enough], 2012, p. 4). The DRC, along with its neighboring countries including the CAR, were singled out in section 1502 of the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010. This legislation requires disclosure of all minerals sourced from this conflict region and an independent audit of the purchasing entities due diligence procedures to ensure that the purchase of mined products does not fund or aid armed groups.

1. Democratic Republic of the Congo

In the DRC, mining that drives further conflict comes from cassiterite –used in the production of tin, coltan –a portmanteaux of colombite and tantalite, wolframite –an ore that contains tungsten, and gold (de Koning, 2011, p. 5). These minerals are often collectively referred to by the acronym 3TG. In the eastern DRC a perpetual state of conflict has seen Congolese military forces, Rwandan Patriotic Army, Rwandan proxy forces, Ugandan and Lebanese dealers, and Congolese rebel groups involved in the extraction and supply chain of 3TG. Resource concessions were also granted by the Kabila regime to Angola and Zimbabwe in exchange for assistance (Meredith, 2011, pp. 537–544). The dynamics of the conflict have led to persistent instability, lack of rule of law, and systemic corruption.

Estimating the size of the conflict gold trade in the DRC is problematic because of the lack of accurate figures, number of groups involved, and ever-changing pipelines for smuggling gold out of the region. Utilizing figures from the IMF’s 2010–2011 country report and those reported by Yager in the U.S. Geological Survey’s 2007 Minerals Yearbook, the IMF shows the scale of the illicit gold trade in the DRC where official gold exports totaled 150 kg but its estimated production was approximately 10 metric tons (IMF, 2014, p. 5). In his policy paper, de Koning (2011, p. 11–12) arrives at a Congolese production figure of 10 metric tons for 2006 by calculating the difference of exports and domestic production in the neighboring countries of Burundi and Uganda. De Koning also notes a drop off in exports from Uganda and Burundi following 2008 and attributes this to being indicative of different smuggling methods being used.

In the Congolese supply chain, the critical market participants are *négociants*—who are the individual traders, and *comptoirs*—the larger buying houses (de Koning, 2011, p. 5). These market participants may be aligned with certain groups in the conflict or may be taking protection from these groups to further fund the conflict and evade sanctions on Congolese exports. The *négociants* often buy from the ASM operations and then bring the raw gold to the cities of Bukavu and Butembo, being taxed by armed groups and the Congolese army while enroute, and then sell the gold to the *comptoirs* (Bafilemba and Lezhnev, 2015, p. 7).

After being collected in the larger cities, gold is then smuggled to Uganda, Burundi, and Tanzania where the origin of gold is obscured through a false declaration of sourcing and sold to a smuggler who then takes the gold on to Dubai or even allegedly sold to conflict linked companies like Berkenrode (operating out of Belgium) (Enough Team, 2012, p. 8). Gold can also be directly smuggled from the DRC to locations like Dubai where consumer products are bought and repatriated to the DRC in a TBML style of operation (de Koning, p. 2011, p. 13).

The trade in conflict gold is extremely damaging to the Congolese economy where the 2014 GDP was U.S. \$55.8 billion and the GDP per capita was estimated at around U.S. \$700 (CIA, 2015b). The economic contributions by the conflict gold industry to the DRC is difficult to quantify as value is not dispersed in an illicit economy in a manner similar to what could be seen in a formal mining sector. Child labor, trade control by armed factions, cross-incentives by corrupt governments and kleptocratic officials, and an inability for governments to enforce rule of law all lead to a continuing crisis in the upstream operations.

2. Central African Republic

The CAR is another nation in the expanded African Great Lakes region beset with a tumultuous political history and mired by extreme violence. Currently operating under a presidency emplaced by the National Transitional Council (CNT), elections are expected to be held in the final quarter of 2015 (CIA, 2015a). The United Nations Multidimensional Integrated Stabilization Mission in the CAR (MINUSCA) which has approximately 11,000 U.N. uniformed personnel is tasked with protecting the civilian population, human rights, and supporting the CNT (“MINUSCA Facts and Figures,” n.d., Strength section; Security Council, 2015). The French military also conducts deployments to the CAR.

The major non-state armed groups in the ongoing conflict in the CAR are the ex-Séléka and the anti-balaka. The ex-Séléka are comprised of mainly Muslim forces of multi-origin militias that integrated with the Séléka movement before it dissolved, becoming the ex-Séléka. The anti-balaka are Christian civilians formed into ad hoc

militias in response to the ex-Séléka (Mellgard, 2015). A third player in the conflict is the Lord's Resistance Army (LRA), led by Joseph Kony who also conducts operations in Uganda and the DRC (CIA, 2015a).

Michel Djotodia, the head of the Séléka before he officially disbanded it, seized power in 2013. He became the first Muslim President in an 80% Christian nation, and subsequently was pressured into resignation in January, 2014 (CAR interim president Michel Djotodia resigns, 2014). The ex-Séléka have since moved their headquarters from the capital of Bangui in the south to Bambari in the central region of the CAR where there is a majority Muslim population.

One ex-Séléka controlled mining town is Ndassima. Located approximately four hours from Bambari, this mine was formerly owned by Canadian exploration company Axmin Inc. before being abandoned in 2012 (Gridneff, 2015). Currently, artisanal miners use this location and are illegally taxed and are even issued mining licenses by the ex-Séléka (Flynn, 2014). Under extremely dangerous and completely unregulated conditions, the ex-Séléka allegedly net 15 kg of gold on a monthly basis. This is reported to be valued at U.S. \$350,000 on the local market (Dembassa-Kette, 2014).

After the ore goes through mercury amalgamation to produce raw gold, it is then smuggled out to neighboring countries and sold in exchange for weapons (Gridneff, 2015). The conflict in the CAR has produced approximately 140,000 refugees of which 106,000 have fled to Cameroon (Kitidi, 2014). This diaspora has allowed established smuggling pipelines to form and aid the illegal export of raw gold.

The LRA has also diversified into raw gold. Reports involve business deals between the LRA and an ex-Séléka officer named Ahmed Sherif (Enough, 2014, p. 2; PECAR, 2014, Annex 19). Raw gold has also been allegedly used by the LRA to purchase weapons from the Janjaweed in Sudan (Enough, 2014, p. 2).

The ongoing conflict in the CAR is devastating in the deaths produced, human rights abuses by the anti-balaka and the ex-Séléka, and economically. With a 2014 GDP of U.S. \$1.79 billion and a GDP per capita of \$600, resource exploitation to perpetuate the conflict dominates the economy (CIA, 2015a). Official exports are extremely low

while the estimated production is about 2 metric tons, worth approximately U.S. \$60 million or what would be over 3% of the economy (PECAR, 2014, para. 135). In 2014, Badica and the National Union of Mining Cooperatives of Central Africa were the only two companies to officially export gold with a sum total official export figure of 1.7 kg (PECAR, 2014). The largest gold buyer in the CAR, Badica, only purchased 1 kg which it then turned into lightweight necklaces so that it could avoid export tariffs on raw gold (PECAR, 2014, paras. 135–136). The opportunity cost of the illicit economy supplanting legitimate companies like Axmin Inc. is immeasurable in all factors to include worker safety, potential exports lost, mining capacity, and regional investment.

B. DUBAI

This section focuses on downstream operations and how illicitly sourced gold is integrated into the legitimate market. While downstream operations are by definition the segment of the supply chain from refiner to consumer, for this section it is also helpful to include the segment of operations from the smuggling/illegal exporter to the refiner. This section does not insinuate that Dubai's market is entirely or even majority illicit, but instead uses a case example of how a developing market can be exploited for nefarious ends.

In contrast to the impoverished states of the DRC and CAR, the thriving and diversified nature of Dubai's financial sector is one of the reasons that it is at a heightened risk for money laundering and terrorist financing (Department of State [DoS], 2015, pp. 458–459). The growing Dubai gold market makes up approximately 20–25% of world gold trade and is at a heightened risk to money laundering and terrorist financing through its scale (Asfour, 2015; Bowers, 2014; Global Witness [GW], 2014, p. 2).

A peculiar factor affecting the legitimacy of the Dubai market is the souks. The gold souks are a marketplace of approximately 250 jewelers, gold dealers, assayers, and refiners who have the capacity and means to buy, sell, and recycle raw gold, coinage, bullion, and jewelry (Enough Team, 2012, p. 10). This is a significant contributing factor to the ease of which money can be laundered and the movement of funds can be obscured

through multiple transactions across a combination of highly liquid commodity and fiat currencies.

In the souk, cash-for-gold dealers can be a significant threat for the integration of illicit gold. Enough (2012, p. 10) points toward these souk dealers paying approximately 10% below spot price for undocumented gold. After purchasing the raw gold, they are then able to recycle it into ingots or bullion before selling it to jewelers or larger companies. The U.N. Group of Experts on the DRC's investigation into the trail of conflict gold through Dubai noted that souk merchants were able to easily purchase gold from the DRC in cash and no questions were asked about the origins of the gold (Group of Experts on the Democratic Republic of the Congo [GEDRC], 2015, paras. 210–215).

Illicit finance becomes more entangled when gold is bought from unknown sources in the souks. Dubai is a global center for hawala (Cassara & Jorisch, 2010, pp. 125–126; O'Brien, 2003) and the souk has the capital and liquidity to maintain operations. With conflict gold being bought at premiums and recycled into anonymously sourced bullion, hawala being frequently settled with gold shipments (Cassara & Jorisch, 2010, pp. 100–101), and TBML often being used to repatriate value to the countries of origin, it is truly a transnational problem.

Larger Dubai gold market participants are not immune to dealing in illegally sourced gold either. The GEDRC's narrative on DRC-sourced conflict gold in Dubai said:

The Dubai Multi Commodities Centre told the Group about its continuous efforts to make the gold trade in Dubai more responsible, mainly through the Responsible Market Participant initiative. In response to a Group request for more information, the United Arab Emirates stated that, as at 18 November, only one company, Kaloti Jewellery International, was involved in the initiative. (GEDRC, 2015, para. 213)

Kaloti Jewellery International is a part of Kaloti Precious Metals. As previously mentioned, Kaloti's Sharjah refinery has been delisted from the DMCC for due diligence failures in their sourcing (DMCC, 2015; McAuley, 2015). During the EY audit of Kaloti, it was discovered by the auditors that 2.4 tons of gold were acquired by the company via

cash-for-gold transactions in the souk without counterparty names or gold origin being recorded (Bowers, 2014).

Certain allegations have also been brought against the DMCC itself in the Kaloti case. These include the DMCC telling EY that the non-compliance results should be kept confidential (Bowers, 2014) and giving instructions on the report verbiage such as how findings of “‘non-compliant low-risk’ are now to be termed by the auditor as ‘compliant with low-risk deviations’ (GW, 2014, p. 8).”

As Dubai develops a reputation as a global financial and commodities center, major issues still stand in the way. The light government management, number of free trade zones, and anonymity of business transactions lends itself to be a potential haven for money laundering and terrorist financing. Despite the growth of conflict-sourced commodity regulation, complacent or complicit actors can derail the positive goals and have far reaching consequences affecting legitimacy of international investment in bullion, entanglement with dark hawala transactions spanning the Middle East and South Asia, and funding armed non-state actors in Africa that prolong conflict and oppress the citizenry.

C. SOUTH ASIA

This section brings a third region into the equation of illicit gold operations. While illicit downstream operations are found throughout most economies, with a higher prevalence in the developing world, high demand coupled with imperfect controls can fuel illicit economies. The scale of business operations and ties between India and Dubai assist in the movement of gold between nations often outside of the formal market sector. India is not alone in the South Asian illicit market for gold but it does represent the greatest level of demand from a population that only has 53% participation in bank accounts of any type (World Bank, 2015c).

India is the world’s largest consumer of gold with consumption demand in 2012 at approximately 864 metric tons and fabrication demand at 942 metric tons per year (PwC, 2013a, p. 29). For this same year, production of gold decreased by more than 10% with estimated reserves of only 67 metric tons (U.S. Geological Survey, 2014, pp. 10.1,

10.14). In a nation where gold holds such strong cultural, religious, and general financial significance (Farah, 2004, p. 111), this imbalance shows the complete reliance on imported gold to satisfy demand.

A constant theme in Indian gold smuggling is the state's tariffs on imports. Given India's high demand and the price of gold being set in U.S. dollars, both a strong U.S. dollar and raising import tariffs result in gold becoming more expensive for the consumer (Shumsky & Mukherji, 2015). As an effect from the rising prices, smuggling then becomes more attractive (WGC, 2015, p. 8).

The annual quantity of gold smuggled into India is generally estimated at just below 200 metric tons (Afonso, 2015; Sharma & Das, 2015; WGC, 2015, p. 8). Reports of smuggling from Dubai often involve small scale movements via individual couriers on flights. This gold is reportedly smuggled to India in the form of finished jewelry, often concealed in body cavities, and even Indian workers in the U.A.E. are used as impromptu couriers in exchange for airfare (Afonso, 2015; Sloan, 2014).

A reliance on imports, enormous and steady demand, and imposition of import tariffs leads to a growing market for smuggling operations. Threats arise from the scale of the smuggling operations, with potential conservative estimates of smuggled gold accounting for 25% of the quantity of official imports, a developing government and economy is losing out on a substantial stream of revenues and an environment that can foster corruption through issue avoidance is being established. The pull from consumers on the demand side also may pressure middlemen and refiners in Dubai to pull on the suppliers from conflict affected regions, thus taking on additional risk to potentially fund armed groups and prolong conflict.

D. SOUTH AMERICA

South America is home to a host of developing economies and contains three countries that are among the top 15 gold producers: Peru, Brazil, and Argentina (PwC, 2013a, p. 13). In the context of this discussion, the effects of ASM operations are highlighted in a discussion of illegal and informal mining operations in Peru outside the confines of conflict sourcing.

Peru is a resource rich nation that in 2012 was ranked sixth in gold production and second in silver production (KPMG, 2013, p. 2). Peru has a GDP per capita of U.S. \$11,800, but as of 2012, 25.8% of the population lived beneath the poverty level and 6% lived in extreme poverty (CIA, 2015c; PwC, 2013b, p. 7). ASM does provide a living for an impoverished segment of the population but it also introduces criminal elements, grossly substandard worker conditions and exploitation, human trafficking, takes revenue away from the state that could be used for investment purposes, and has profound environmental impacts. A 2013 Peruvian government publication and article in *El Mercurio* (as cited in Verité, 2012, p. 18) estimated that ASM directly employs 100,000 people with another five times the amount indirectly supporting the industry.

Further quantifying the scale of this illicit economy, EY estimated that illegal mining constitutes 20% of Peruvian gold production (EY, 2014, p. 36). In response to this growing threat, the government under President Ollanta Humala took a carrot-and-stick approach to illegal ASM operations by offering a deadline of April, 2014 for these operations to begin the process of becoming legal and in the interstitial time period before they are formalized, to continue operations (Dube & Kozak, 2014; EY, 2014, p. 37; Jamasmie, 2014). Despite these measures, informal operations continue to occur in the Peruvian Andes and the low-lying Amazon basin in the environmentally sensitive and protected region of Madre de Dios.

In 2013, PwC stated, “six mining companies and the small producers of the region of Madre de Dios concentrate 62% of [gold] production (PwC, 2013b, p. 16).” While not discussing the total implications of this statement, most of the problems lie with the “small producers” mentioned. The Peruvian government defines the legality of operations by their concession permits, registration, environmental impact surveys, consultation with the indigenous to ascertain the social impacts, and labor practices (EY, 2014, pp. 35–37; KPMG, 2013, pp. 9–11; PwC, 2013b, pp. 34–37; Verité, 2012, p. 17). In practice, illegal mining operations occur throughout Madre de Dios without attempts at formalization.

In Madre de Dios, forests are clear cut of vegetation and then the ground is blasted with water so the resulting silt can then be exploited through filtration and mercury amalgamation. This process destroys jungle habitats, puts high levels of

sediment into the rivers where all life dies, and pollutes the groundwater and downstream areas with mercury (Elbein, 2015; Verité, 2012, pp. 24–25). The worst effects of the illegal operations come from the indirect operations needed to support this illicit economy. Debt bondage (known locally as *habilitación-enganche*), human trafficking for labor, support, and sexual services, child labor, laundering, smuggling, and payment through *cachorro* (as discussed in the example of ASM in La Rinconada) all occur (Finnegan, 2015; Verité, 2012, pp. 21–27, 63).

Integration of illicitly mined gold occurs through sales to larger refineries, cash-for-gold shops, and smuggling to Bolivia for export (Finnegan, 2015; Verité, 2012, pp. 25–27, 48–50, 54, 63, 74–76). As a result, tax revenue from corporate income tax, mineral taxes, value added taxes, royalties, and concession rights are all lost (KPMG, 2013, p. 11; PwC, 2013b, p. 37). *El Mercurio* (as cited by Verité, 2012, p. 25) reported that Peru has lost tax revenue of U.S. \$450 million each year because of illegal operations. This loss only quantifies the potential tax revenue; the benefits to formalized mining operations could also stop the illicit support economy thereby increasing tax revenue from these businesses, increase worker and environmental safety, and lessen the market for human trafficking.

E. SUMMARY

Illicit economies can develop around all operations leading to human rights abuses, financing of conflict, depriving the state of much needed tax revenues, and producing a vehicle for money to be laundered, transferred, and obscured. As this illicit market is transnational in nature, policy needs to be formulated that addresses external vulnerabilities in addition to the internal. This next chapter presents the policy environment of select states, IGOs, and industry groups aimed at stopping this illicit economy from a macro perspective.

IV. POLICY AND REGULATION

This chapter details select policy and legislation of IGOs and states as they relate to precious metals, and more specifically, gold. While similar to a literature review on policy, this chapter bridges the broad operational chain dynamics and specific regional cases of illicit finance related to gold and addresses relevant policy to address these major issues. Individual state responses are important to stymie these illicit flows, but as a majority transnational issue, IGO recommendations assessing regional risks and attempting to create standardization is essential.

A. IGOS

This section details gold-related CTF policy and recommendations created by the U.N., OECD, and the FATF. The U.N. is selected because of the global scope of its membership, positive action that may be taken through peace operations and sanctioning, a broad range of published materials related to international stability, and the international forum created for member states. The OECD is selected because of its work in producing tailored policy recommendations aimed at economic development. While AML/CFT is not a primary purpose of the OECD, the gold supplement of their due diligence guidance (OECD, 2013) is the basis for LBMA and DMCC sourcing policies and the WGC's conflict-free gold standard (WGC, 2012). Much of the OECD's work on countering corruption, bribery, and corporate misconduct also has relevance to CTF efforts as it pressures the market makers of illicit economies. The FATF is the final organization selected because of its central-founding purpose of AML/CFT and its keystone work on promulgating recommendations that are the international standard for financial sector integrity.

1. U.N.

The United Nations Environment Programme ([UNEP], 2009, p. 5) states that 40% of conflict globally in the last 60 years has at least in part been fueled by resource access. While only a minority of these conflicts are attributable to gold, this resource's ability to fund and sustain conflict, negatively impact the environment, and create large

illicit economies further destabilizing impoverished regions requires a summation of the individual impacts to be able to assess its net effects.

One of the major impacts of illicit economies surrounding gold relates to human rights abuses. The Office of the High Commissioner for Human Rights ([OHCHR], 2011) describes the idealized responsibilities that industries have in ensuring protections to their workers and the responsibilities that governments have in providing oversight, ensuring compliance, and establishing an environment where worker rights can be enforced. The significance of worker protections in CTF comes from the attempt to deny the growth of illicit economies instead of merely the predicate effects of funding conflict and nefarious activities. Like other IGO products, this document is not enforceable in international law but does create a foundation upon which policy and legislation can be based.

The U.N. also maintains the capability to sanction individuals, groups, or states under the U.N. Charter (1945, Chapter VII). Exercising this capability, the U.N. has sanctioned ex-Séléka and anti-balaka individuals in the CAR under U.N. resolution 2127 (Security Council Committee concerning the CAR, 2015) and armed Congolese actors in the DRC under U.N. resolution 1533 (Security Council Committee concerning the DRC, 2015) which were highlighted in Chapter III of this thesis. The freezing of assets and bearing down on sanctioned entities' means of support and continuance can be effective in denying formal sector access and providing a deterrence for non-sanctioned entities considering doing business with them, but it does not necessarily starve the illicit economies.

U.N. peace operations can also affect illicit financing. The United Nations Organization Stabilization Mission in the Democratic Republic of the Congo's (MONUSCO) U.N. mandate contains directed efforts to put mining activities in the eastern DRC under government control (Security Council, 2014). The rebuilding of government and economic institutions during and after conflict may be difficult because of power dynamics, persistent instability, and systemic corruption, but providing oversight of mining and export activities and the groups and workers engaged in these does produce a net benefit if rule of law can be attained.

2. OECD

The OECD (2011) published their Guidelines for Multinational Enterprises, which is in line with the work of the OHCHR and UNEP referenced in the previous section. Significantly, these guidelines address corporate roles in relation to human rights, the environment, bribery, and taxation (OECD, 2011). The economic effects of tax revenue deprivation on governments can be particularly devastating in the developing world as it expands the cycle of poverty in already dispossessed populations by denying them government services. The OECD views tax compliance as an essential portion of “corporate citizenship” (OECD, 2011, p. 60) and this can be related to the operational chain of gold from source to market as informal ASM operations, obscured exports and imports, and refiners integrating illicitly sourced gold all stunt the additional benefits from taxation.

The OECD’s gold supplement in their Due Diligence Guidance (OECD, 2013, pp. 61-113) is the basis for industry action by the WGC (2012), LBMA (2013), and DMCC (2012). This guidance provides a five-step framework which accents the requirements for committed management, a risk-based approach to supply chain management, operations to mitigate these risks, independent audits, and transparency in corporate reporting (OECD, 2013, pp. 72-113). While not legally binding, the adoption of this guidance by industry has provided it with its effectiveness.

3. FATF

The FATF Recommendations is the seminal work on AML/CFT regulation and policy. Rooted in anti-laundering mechanisms for drug money in the early 1990s, the Recommendations have evolved with the global environment and have expanded to over 180 signatories across the FATF and eight FSRBs (FATF, 2012, p. 7). The aggregate FATF network is structured as the premier forum for AML/CFT and its promotion is stressed by the United States as an implement to global economic security (White House, 2015, p. 15).

Recommendations 1, 22, 23, 28, 32, and 34 have been highlighted by the IMF as having direct relevance to the precious metals and stones markets (IMF, 2012, pp. 27–

28). The first recommendation, implementing a risk based approach (RBA) (FATF, 2012, p. 11), is further developed in the FATF's (2008) RBA Guidance for Dealers in Precious Metal and Stones and may be the most substantive recommendation with applicability to precious metals dealers. The RBA guidance was written prior to the latest publication of The FATF Recommendations, which creates asymmetry in the recommendation numbering; but the intent, and especially the RBA intent on country and geographic risks (FATF, 2008, pp. 20–22) gives the most holistic AML/CFT appraisal of illicitly sourced, exported, and laundered gold. Recommendations 22 and 23 both discuss designated non-financial bodies and profession's (DNFBP) responsibilities in conducting due diligence and alerting in suspicious transactions (FATF, 2012, pp. 19–20), recommendation 28 highlights the creation of DNFBP regulatory bodies such as the DMCC or LBMA (FATF, 2012, p. 23), recommendation 32 discusses cash couriers which is often seen in cash-for-gold and illicit sales (FATF, 2012, p. 25), and recommendation 36 discusses feedback on the efficacy of solutions and the scope of money laundering and illicit financing issues (FATF, 2012, p. 26).

B. STATE-LEVEL

This section gives an overview of regulation and legislation in the United States, U.A.E., and Peru. The rationale for using these three countries relates to their respective impacts on gold supply and demand, the variance in risks faced and government capability in enforcement, and approaches to combating the respective illicit economies. These examples are narrowly focused on gold-based AML/CFT unless immediate application of strengthening legislation in an adjacent AML/CFT category is necessary; though it must be remembered that illicit gold transactions do not exist in a vacuum and other forms of illicit finance are generally incorporated.

1. United States

The United States has an extensive system of AML/CFT legislation and transparency of financial operations is regulated through laws such as the Bank Secrecy Act of 1970, Money Laundering Control Act of 1986, Title III of the Uniting and Strengthening America by Providing Appropriate Tools Required to Intercept and

Obstruct Terrorism Act of 2001 (USA PATRIOT Act) and a multitude of Executive Orders and Federal Statutes which allow the interagency to collect intelligence, track illicit finance, and prosecute primary and predicate offenses. Further, the FATF (2006, p. 4) has pointed out an increase in compliance since the USA PATRIOT Act. Following the third round of mutual evaluations by the FATF, section 1502 of the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 also provided legislation on the sourcing of materials from conflict-affected regions.

The last mutual evaluation by the FATF (2006, p. 12) estimated “approximately 20,000 dealers in precious metals” servicing a portion of the industry which by 2012 had expanded to an industry satisfying a nationwide consumption demand of 162 metric tons and a fabrication demand of 147 metric tons (PwC, 2013a, p. 29). The FATF (2006, p. 200) noted the legislated requirements to establish anti-money laundering programs by precious metals dealers but gave ratings of “non-compliant” based on the lack of requirements for DNFBP record keeping (FATF, 2006, p. 205) and suspicious activity report (SAR) submission (FATF, 2006, p. 210).

Currently, gold dealers are subject to the regulations enforced by the Financial Crimes Enforcement Network (FinCEN) (FinCEN, Department of the Treasury, 2015) and specifically parts 1010 and 1027. Part 1010 gives general provisions and the requirements for anti-money laundering programs, SARs, currency transaction reports (CTR), due diligence, and record keeping requirements (General provisions, 2015). Part 1027 specifically provides regulation for gold dealers and to qualify as a precious metals dealer in the United States, annual purchases and receipts must exceed \$50,000 of 50% purity alloy of precious metals as defined in part 1027.100 (Rules for dealers in precious metals, precious stones, or jewels, 2015). Together, these parts generally affect reporting requirements to the intersection of fiat currency purchases of a commodity.

2. United Arab Emirates

As a federation of seven emirates, control varies on different issues between the federal government level and the individual emirate level (CIA, 2015d, Government section). The Central Bank of the U.A.E., a federal organ, was founded by Union Law

No. (10) of 1980 Concerning the Central Bank, the Monetary System and Organization of Banking (1980) and oversees the Anti-Money Laundering and Suspicious Cases Unit, the Emirate's FIU, that was established by article 7 of Federal Law No. (4) of 2002 Regarding Criminalization of Money Laundering.

The last FATF mutual evaluation of the U.A.E., conducted in 2008, cited certain issues with respect to gold. In this report, prevalence of sales and purchase of gold followed by transshipment of gold or large quantities of cash was considered “not uncommon” and declaration on export was considered a customs duty concern and not an AML/CFT concern (Middle East and North Africa Financial Action Task Force [MENAFATF], FATF, & IMF, 2008, p. 54) and record keeping was not conducted for AML/CFT purposes (MENAFATF et al., 2008, p. 118). The requirement for third party audits (DMCC, 2012) by the DMCC since this mutual evaluation does enforce transparency and adequate record keeping but cash-for-gold operations still remain a potential issue for the integration of illicit gold.

The intersection of hawala and gold may also open the door for laundering. Hawaladars are prevalent in the souk (Cassara & Jorisch, 2010; O'Brien, 2003) and efforts have been made since 2003 to regulate these businesses (Central Bank of the United Arab Emirates, 2003). Hawala licensing through the Central Bank requires a no-charge application for the hawaladar with information on their occupation and a standardized ledger of remittances (Central Bank of the United Arab Emirates, 2003, slides 5, 8, 12 & 14). However, the method expected to be used in settling accounts is notably absent from the registration form and record keeping (Central Bank of the United Arab Emirates, 2003, slides 8, 12 & 14) while opportunity is still provided for the transfer of value through settlement imbalance.

3. Peru

An excellent primer to AML/CFT policy in Peru is the National Plan for Fighting Money Laundering and Terrorist Financing (Superintendent of Banking, Insurance, and Private Pension Funds [SBS], 2011). This plan was enacted by Supreme Decree No. 057-2011-PCM. The National Plan addresses the transnational effects of money laundering

and threat finance, provides overarching purpose for an AML/CFT plan, assesses risks and vulnerabilities, provides a way ahead for AML/CFT measures, and identifies the governmental stakeholders (SBS, 2011, pp. 9, 12, 19,27, and Annex). With a large cross over to gold-based threat finance, the National Plan identifies the risk associated with informal businesses in the Peruvian economy and the delicate formalization process that must occur to fully implement AML/CFT measures (SBS, 2011, p. 21).

The Financial Action Task Force on Money Laundering in South America (GAFISUD; later renamed GAFILAT), published a 2011 risk assessment of DNFBPs in GAFISUD. The risk level for money laundering and threat finance was assigned a four out of five for DNFBPs (GAFISUD, 2011, p. 16), citing low registration rates across South America (GAFISUD, 2011, p. 9), low supervision in this sector, and the anonymity that allows for manipulation of exports and smuggling (GAFISUD, 2011, p. 18). However, mere regulation of DNFBPs in downstream operations does not address the thriving illicit economy of the informal ASM sector discussed in Chapter III.

The Peruvian government (as cited by Valencia, 2013) has attempted to formalize ASM operations, especially in the Madre de Dios region, through Law 27651 in 2002, the National Plan for the Formalization of Artisanal Mining in 2011, and legislative Act 1100. Throughout this, efforts have been made to encourage ASM miners to file declarations of intent, mineral concession rights, authorizations for land usage, authorization for water usage, and submit environmental plans, especially throughout 2013 (Ministerio de Energía y Minas, 2013). However, Peru still faces a high level of difficulty in formalization because of the large profits, remote locations (Verité, 2012), and generally informal nature of the economy (SBS, 2011, p. 21) where the illicit mining economy provides one of the only ways to earn money.

C. SUMMARY

The unique factors in many countries place an emphasis on tailored risk-based strategies and initiatives to counter illicit finance and the economies that are grown out of them. Dependent on government legislation and capability, risk borne out of the specific economy, and intersections with other money laundering and threat finance typologies

within a state, the results of an individual risk-based approach must be thorough, tailored, and acknowledge the transnational nature of threat finance.

V. SOCIAL NETWORK ANALYSIS OF THE AGGREGATE FATF/FSRB NETWORK

This chapter explores the network structure of the FATF/FSRBs at the state and jurisdiction level (both referred to as actors for standardization and proper methodological terminology) and its potential effects on policy targeting and identification of at-risk states and jurisdictions. Furthermore, insight into network structures will be addressed and strategies for enhancing network resilience and policy targeting will be discussed.

The FATF itself is structured around 34 nations, the GCC, the European Commission, one state observer, and an exhaustive list of IGOs and agencies (“FATF members and observers,” n.d.). In association with the FATF are eight additional FSRBs that address common issues related to the exploitation of the financial sector for nefarious purposes and the potentially destabilizing effects economically, financially, and physically.

IGOs are effective in the common forum created, and they enable the construction of conduits for information to pass and ties between actors to form. As illustrated by the nature of the FATF/FSRB networks, recommendations can be made, but there is no mechanism of enforcement other than on the individual member level. The network does reinforce norms, values, and procedures but cannot entirely shoulder the burden.

A. METHODOLOGY AND ATTRIBUTE DATA

Chapter I presents an overview of the methodology for this chapter and the sources used for the compiled dataset. This section gives further definition to the methodology by explaining the network boundaries, the logic behind the valuation of ties, a discussion of the difference between ties and conduits, and purpose for inclusion of GDP data in the compiled dataset. The compiled dataset and an in-depth discussion of its sources are presented in the Appendix.

1. Network Boundaries

This chapter presents individual networks and the aggregate network formed from actors' membership in multiple FSRBs and the FATF. The value of the aggregate network lies in its broad scope to capture the international AML/CFT policy network. Individual networks include all actors with varying degrees of membership status but non-members are also included to enable direct comparison between individual networks.

Sub-state actors or jurisdictions are also included in the individual networks and the aggregate (e.g., Aruba, Curaçao, Macao, and Hong Kong). Not only do they often have membership in FATF/FSRB networks (see Appendix), but economic latitude inherent in their statuses as either special administrative regions (e.g., Hong Kong) or subordinate parts of a larger entity (e.g., Aruba as a part of the Kingdom of the Netherlands) are important to include.

Isolates are actors with no ties to other actors. In the aggregate network, 11 isolates are included as shown in Table 1. These actors are important to include in the analysis because their absence from network membership may indicate a higher risk of criminal and terrorist financing, unwillingness to cooperate with international norms, or general inability of governance. Isolates may be excluded from some sociograms for ease of visualization but their presence is still included in calculating various metrics.

Table 1. Isolate States and Jurisdictions

Cameroon	CAR	Chad	DRC
Rep. of Congo	Djibouti	Equatorial Guinea	Eritrea
Gabon	Islamic Rep. of Iran	Kosovo	

List of isolate states and jurisdictions that are not members of the FATF or any FSRB.
See Appendix for sources.

2. Valuation of Ties

Ties between actors within each individual network and the aggregate network are coded based on four categories with the value of the tie strength shown in parentheses: no status/no tie (zero), other (one), observer (two), and member (three). All ties coded are undirected, meaning that if an actor has some degree of affiliation within a network, the

tie strength between that actor and all other network members is equal regardless of that actor's contribution to the network.

A counterargument exists to this method of valuing ties in that it is an oversimplified approach. Giving all ties a strength between one and three and an undirected nature may minimize the nuances of membership. The simplified allocation of strength values implies that a full member state has one and a half times the contribution of an observer and three times the contribution of an actor with 'other' status. This may not adequately reflect the importance of contributions from members' signatory abilities—possibly undervaluing membership, or possible nominal membership status where a tie value may be overvalued (e.g., the DPRK's observer status since 2014 [“Democratic Peoples' Republic of Korea,” n.d.] in the Asia/Pacific Group on Money Laundering (APG) gives ties to other APG members including the Republic of Korea and the United States). This problem is also present in the undirected nature of the ties because it insinuates that all members' contributions are equal regardless of capability (e.g., Yemen and Saudi Arabia both have full membership in the Middle East and North Africa Financial Action Task Force [MENAFATF] [“About MENAFATF: Members and observers,” n.d.] meaning there is an equal tie strength and therefore equal capability and cooperation between Yemen and Saudi Arabia).

The tie strength being put in four categories means that it is ordinal data instead of continuous. To accurately reflect the contributions and nuances of intra-network relations would require quantifying an individual subjective assessment of all 201 actors that have some degree of network membership. Not only is this difficult to capture and contains its own inherent risks, but international relations outside the bounds of the AML/CFT network precludes the ability for a temporal snapshot to maintain protracted relevancy (e.g., the Arab Spring's effects on intra-network relations between actors in MENAFATF). To simplify the analysis of FATF/FSRB network resilience and policy targeting, simplified and undirected ties are adequate to map the network.

3. Ties versus Conduits

The nature of the relationship networks documented in this chapter captures the interrelations on an actor-by-actor basis. All nine networks also contain some degree of outside IGO membership (e.g., the OECD's status in the FATF ["FATF members and observers," n.d.] or the FATF's observer status in MENAFATF ["About MENAFATF: Members and observers," n.d.]). These IGO networks would provide a more robust general nature to the network but their membership generally reflects a conduit whether real, potential, or nominal, rather than a relation that is realized by a tie.

An example of a conduit versus a tie is the Egmont Group, an IGO based on cooperation between FIUs (<http://www.egmontgroup.org>). While ties may exist within this network such as between the United States' FinCEN and the United Kingdom's National Crime Agency resulting in tangible cooperation, other relations could best be described as nominal, such as Lebanon's Special Investigation Commission Fighting Money Laundering and Israel's Money Laundering Prohibition Authority ("List of members," n.d.). For this reason, the Egmont Group is not included in assuming actor-by-actor AML/CFT ties. Similar logic is used in the exclusion of the U.N.'s observer status in FATF/FSRB networks ("FATF members and observers," n.d.) and individual FSRB observer status in other FSRBs. This means that conduits are excluded from the network because they only could be used to identify a potential for information transfer and do not necessarily contain the resiliency of a tie. The sole exceptions are Kuwait, Bahrain, Saudi Arabia, Qatar, United Arab Emirates, and Oman membership in the FATF represented by the Gulf Cooperation Council (GCC) and Dutch Caribbean states' memberships in the FATF under the auspices of the Kingdom of the Netherlands ("FATF members and observers," n.d.).

Defining the nature of ties while excluding conduits also has the added benefit of viewing the AML/CFT policy world through the lens of national self-determination. Membership in the U.N. is practically universal with 193 states in the U.N. General Assembly ("Member states of the United Nations," n.d.) and relations ranging from nominal conduits to robust ties. Individual issues faced regionally, religiously, ethnically, historically, or culturally are often reflected in membership (e.g., the Arabic speaking

world's prominence in MENAFATF ["About MENAFATF: Members and observers," n.d.] or the former Soviet bloc and Central Asian membership in the Eurasian Group on Combating Money Laundering and Financing of Terrorism [EAG] ["Eurasian Group on Combating Money Laundering and Financing of Terrorism," n.d.]) and may actually add resiliency in ties and network strength because of this self-determination.

4. Attributes

The compiled dataset includes the GDP for 211 states/entities derived from the World Bank and the CIA's *The World Factbook*. In this chapter GDP data is mainly used for the purpose of visualizing node's (actor's) size based on continuous GDP data. This same data could be further used to show correlation between economic size and other attributes such as degree centrality (number of ties to other actors). GDP data sources are further described in the Appendix.

B. NETWORKS AND THE AGGREGATE

This section introduces the individual FATF/FSRB networks through sociograms (network maps), select metrics, and a brief network description. While the individual visualizations exclude all isolates (any actor that has no level of network membership), isolate presence is still included in descriptive metrics to enable ease of comparison between networks. The benefit to a consistent 212 actor network size is reflected in the measure of network density, which is calculated by the number of ties in a network divided by the number of potential ties (Everton, 2012, p. 399). The output is on a scale of zero (sparse/cosmopolitan) to one (dense/provincial) and can only be used to compare equally sized networks. With increasing actor membership, potential ties reflected in the denominator increases exponentially while an actor can realistically only maintain a limited number of ties (Everton, 2012, p. 399), effectively causing larger networks to be naturally more cosmopolitan. An alternative method for measuring network density is average degree centrality (sum of all ties in a network divided by number of actors) (Everton, 2012, p. 397), but by consistently maintaining a 212 actor network other benefits are realized such as the decrease in format errors in SNA programs when visualizing the aggregate network.

It should be noted that after the removal of isolates, all FATF and FSRB networks are cliques, meaning that all actors have ties to all other actors within their network, only weighting based on membership status determines placement. Metrics such as clustering coefficients, fragmentation, connectedness, E-I index, diameter, distance, and components do not provide valuable information because of this.

Despite all actors having ties with all other non-isolate actors in each network, denser clusters are often formed in the sociograms because of the multidimensional scaling algorithm used. This algorithm assigns all actors a position in k-dimensional space based on their similarities or dissimilarities in the input matrix, calculates the stress function of the actors' positions, and adjusts these positions until stress is minimized (Borgatti, 2007; Everton, 2012, pp. 58-59, 401). Optimizing the stress function results in clusters of actors with similar membership status, actors with dissimilarities often sent to the periphery (or sometimes similar actors simply to minimize the stress function), and sometimes a crystalline clique structure.

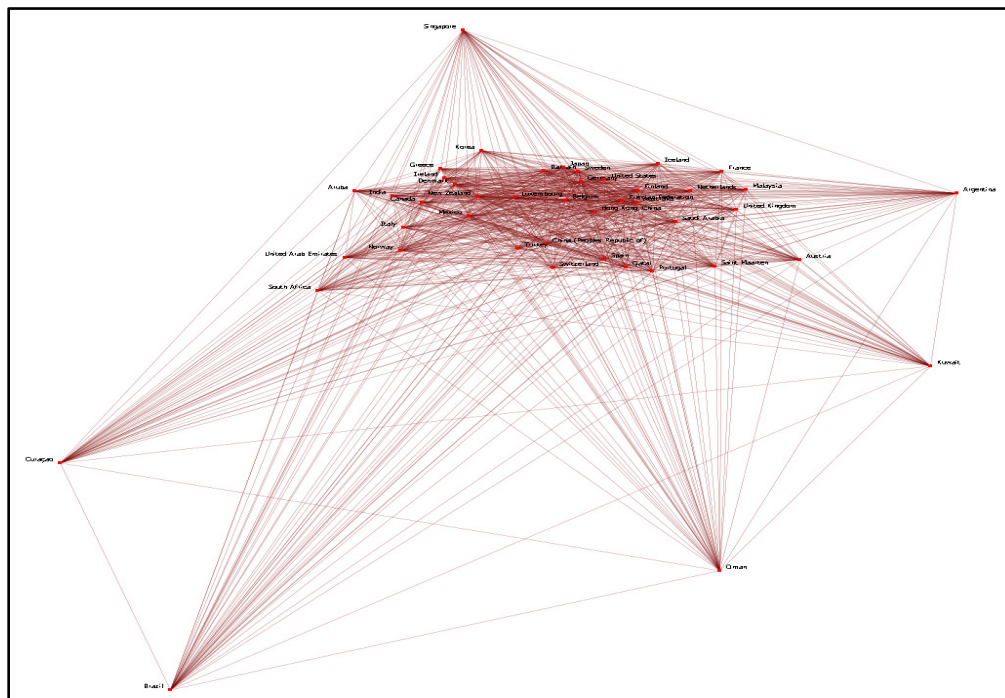
The value of this network analysis is inherent in the co-membership in multiple networks and the ties that are therein formed. Mean network density of the FATF and FSRBs is 0.023 with a range of 0.007 to 0.053. In the following discussion of individual FATF/FSRB networks, those with less member states or jurisdictions will have a lower density because the remaining non-members are isolates and represent potential ties.¹

¹ All FATF/FSRB cliques exist in a 212 actor network. This means that there are 44,944 potential ties when calculating the density of each FATF/FSRB. Because each actor in a clique has a tie with all other actors in that clique, the number of actual ties increases as the number of members increases, and therefore the density of that network increases.

1. Financial Action Task Force

After isolates (i.e., non-members) are removed, the FATF is a 44 actor clique with all actors having either member or observer status in the network. This is the foundational AML/CFT IGO established in 1989 and contains all G7 nations (“FATF members and observers,” n.d.), Russia is also a FATF member despite their G8 suspension (Acosta, 2014). The Dutch Caribbean is included under the auspices of the Kingdom of the Netherlands and the nations comprising the GCC are individually listed so as to reflect actor-by-actor ties within the network (“FATF members and observers,” n.d.). FATF network density is 0.042.² Figure 1 displays a sociogram of the FATF with isolates removed.

Figure 1. Sociogram of the FATF network



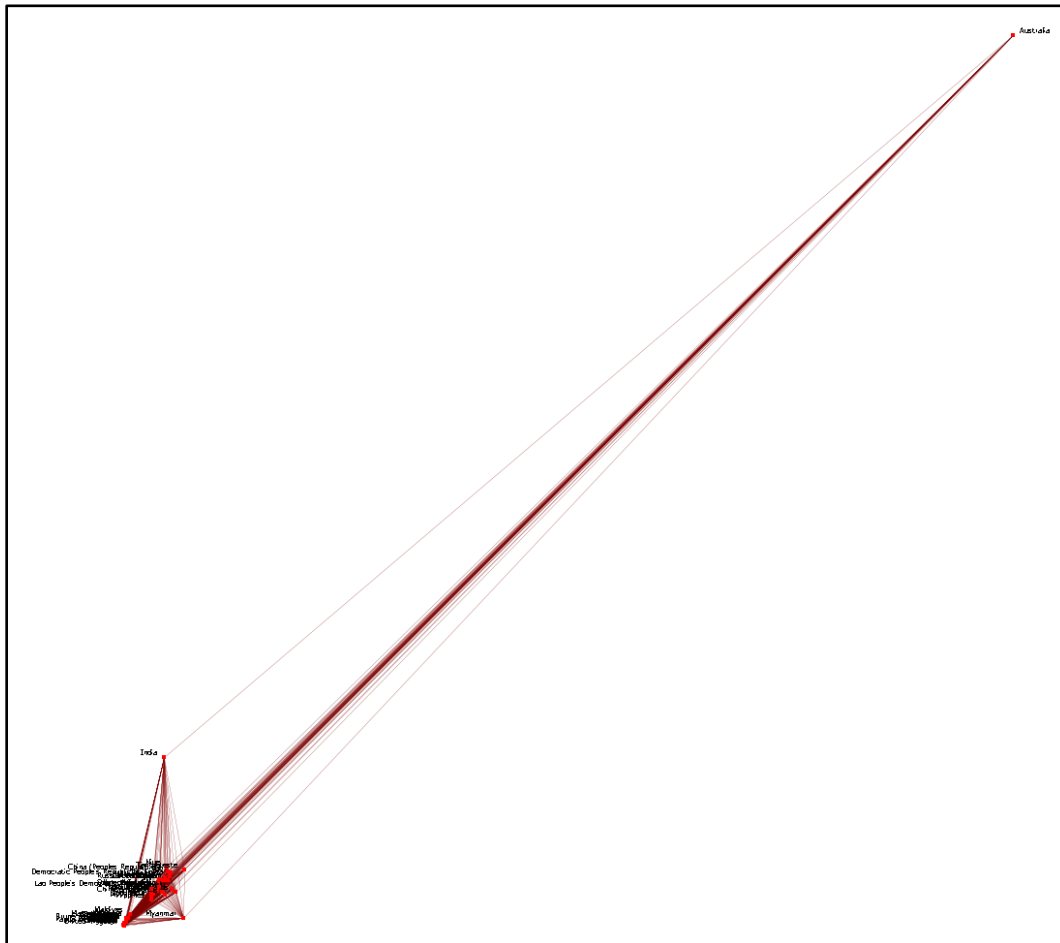
Sociogram of the FATF network with all non-members removed. See Appendix for sources.

² While the sociogram is presented with isolates removed, network metrics like density are calculated with isolates included. This applies to all FATF/FSRB networks examined.

2. Asia/Pacific Group on Money Laundering

After isolates are removed, the APG consists of 49 mainly Pacific Rim, South Asian, or European large economy nations (“Members & observers,” n.d.). Notably, the Democratic People’s Republic of Korea (DPRK) is an observer to this network (“Democratic Peoples’ Republic of Korea,” n.d.). Earlier in this chapter the nature of conduits versus ties was discussed, and because of DPRK membership, a tenuous tie is illustrated between the DPRK and other APG member states that likely does not have the strength, resilience, or reciprocal directionality of other ties. APG network density is 0.053. Figure 2 displays a sociogram of the APG with isolates removed.

Figure 2. Sociogram of the APG network

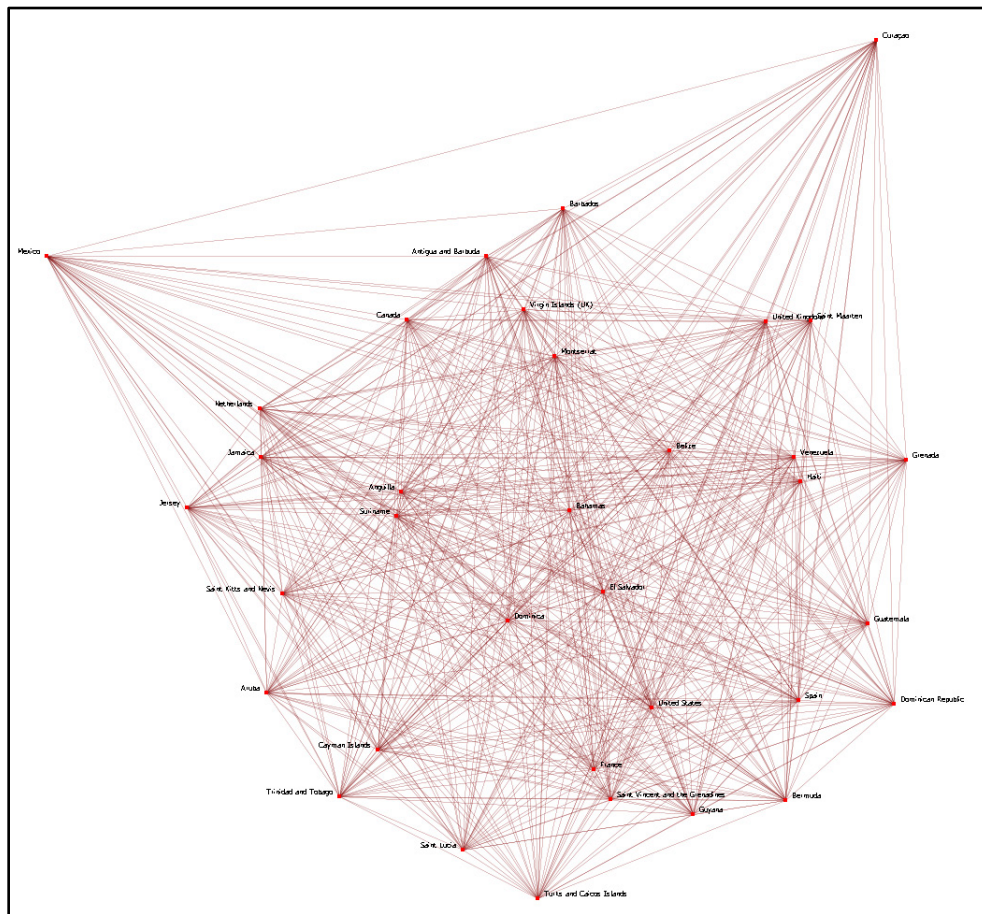


Sociogram of the APG network with all non-members removed. See Appendix for sources.

3. Caribbean Financial Action Task Force

After isolates are removed, the Caribbean Financial Action Task Force (CFATF) consists of 35 nations or sub-state entities mainly in the Caribbean and Americas (“Member countries,” n.d.). Because of the presence of European possessions in the Caribbean, many actors also have ties to the FATF and Committee of Experts on the Evaluation of Anti-Money Laundering Measures and the Financing of Terrorism (MONEYVAL) networks (e.g., Curaçao is an actor in this network and a possession of the Kingdom of the Netherlands, therefore sharing membership in these other two networks [“FATF members and observers,” n.d.; “Council of Europe,” n.d.]). CFATF network density is 0.027. Figure 3 is a sociogram of the CFATF with isolates removed.

Figure 3. Sociogram of the CFATF network

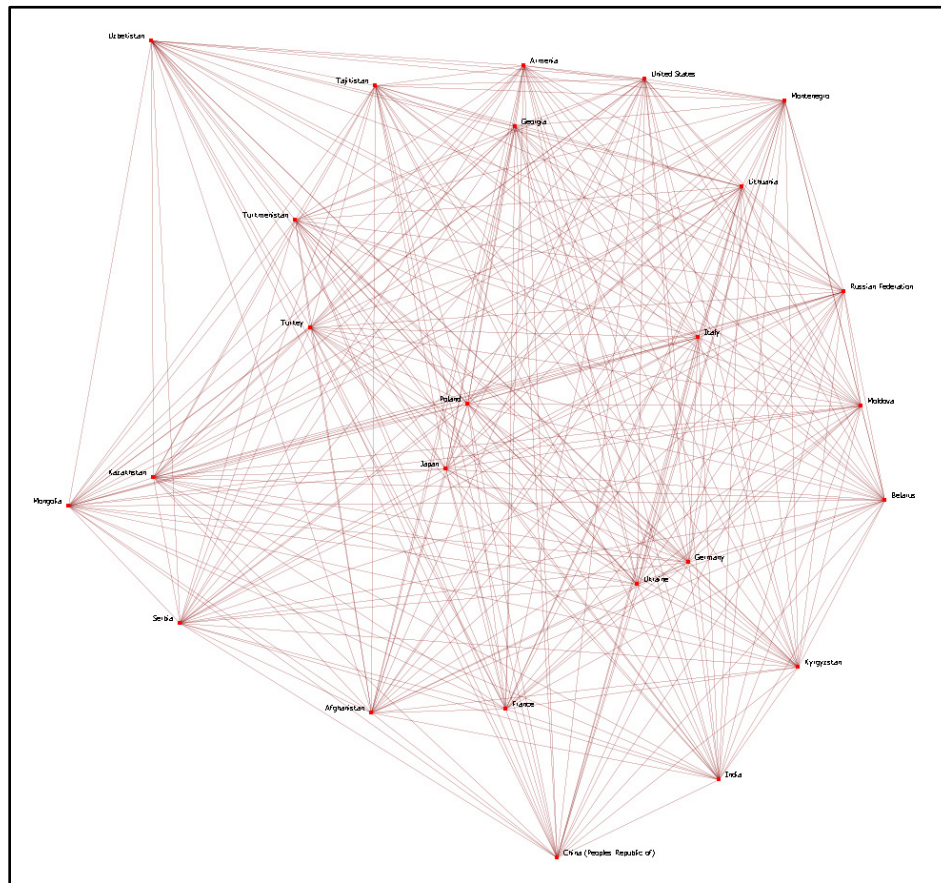


Sociogram of the CFATF network with all non-members removed. See Appendix for sources.

4. Eurasian Group on Combating Money Laundering and Financing of Terrorism

After isolates are removed, the EAG consists of 25 members. It has a low density (0.013), which reflects the low participation rate in this network. While some actors in this network have high degree centrality in the aggregate network, it is mostly comprised of Central Asian states as full members and a high proportion of former Soviet-bloc observers (“Eurasian Group on Combating Money Laundering and Financing of Terrorism,” n.d.). Figure 4 displays a sociogram of the EAG with isolates removed.

Figure 4. Sociogram of the EAG network

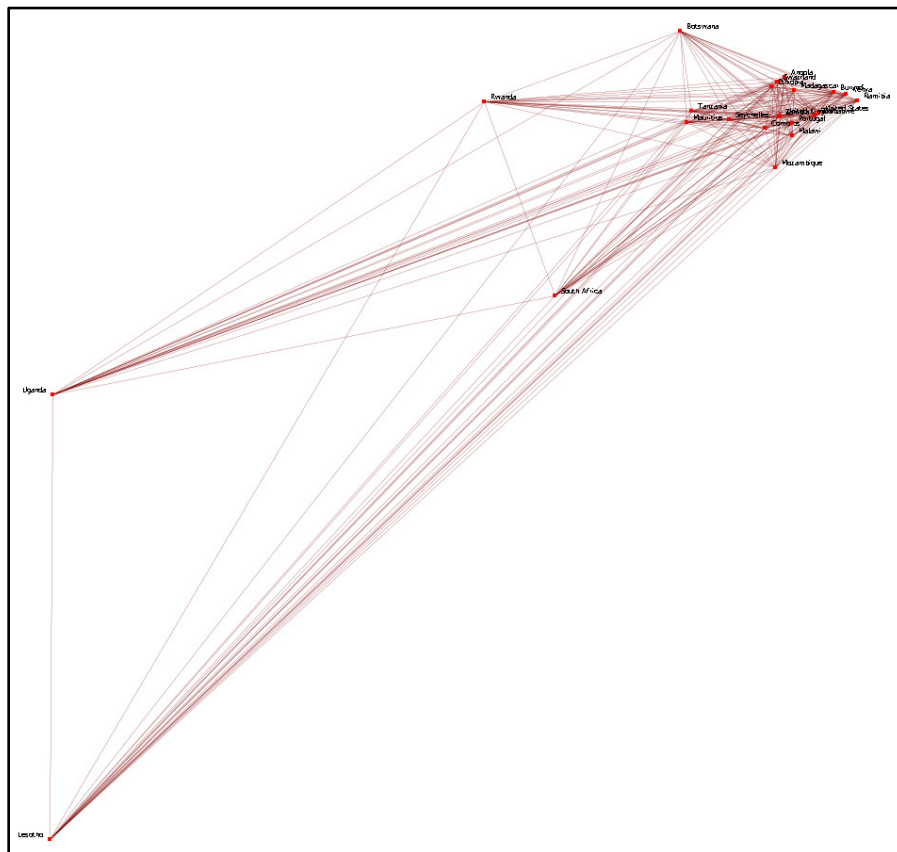


Sociogram of the EAG network with all non-members removed. See Appendix for sources.

5. Eastern and Southern Africa Anti-Money Laundering Group

After isolates are removed, the Eastern and Southern Africa Anti-Money Laundering Group (ESAAMLG) consists of 23 members, which yields a low level of density (0.011) that is somewhat mitigated by observer status of some high degree centrality actors such as the United States and U.K. (“Eastern and Southern Africa Anti-Money Laundering Group,” n.d., Members & cooperating partners tab). As will be discussed later in this chapter, the Indian Ocean nation of Comoros is significant as it also has network membership in Inter-Governmental Action Group against Money Laundering in West Africa (“Member states,” n.d.). Figure 5 displays a sociogram of ESAAMLG with isolates removed.

Figure 5. Sociogram of the ESAAMLG network

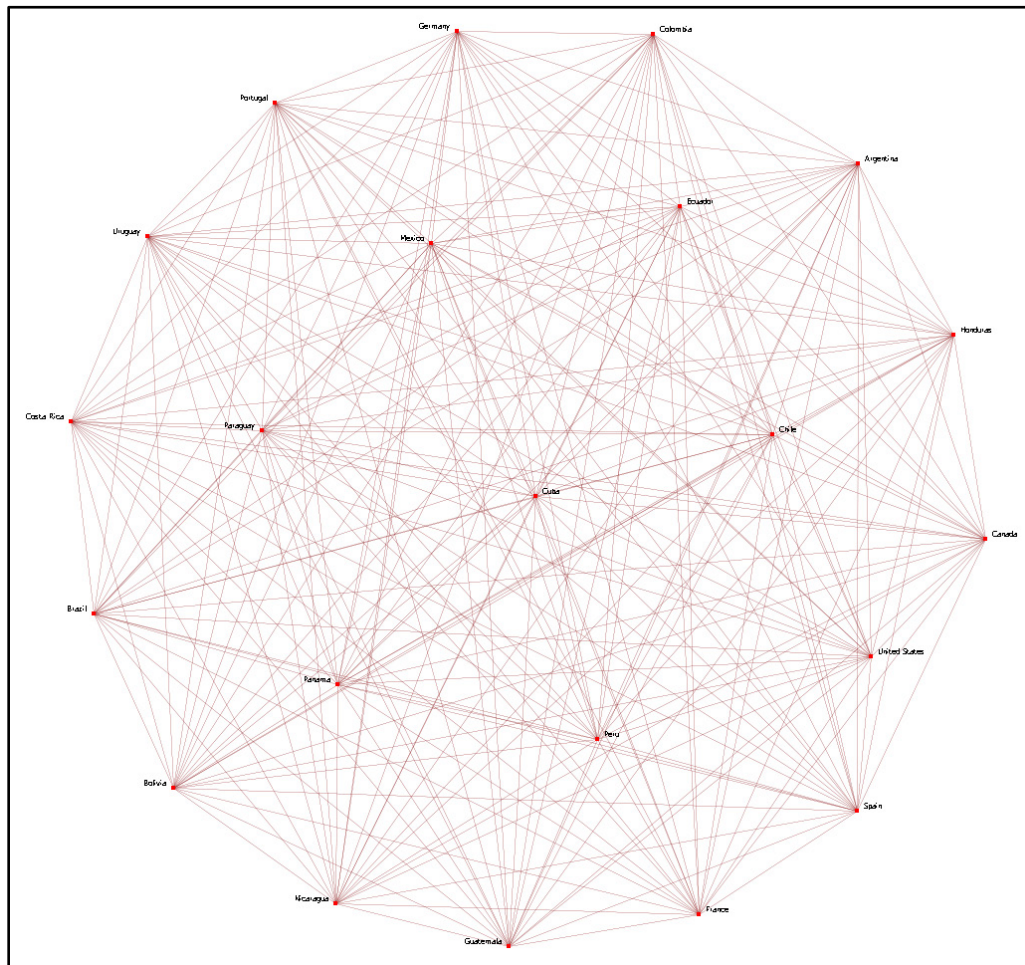


Sociogram of the ESAAMLG network with all non-members removed. See Appendix for sources.

6. Financial Action Task Force of Latin America

Akin to the MENAFATF in its structure, the 22 member GAFILAT network (formerly GAFISUD) has low density (0.010) and participation external to South America is centered on high income nations—Canada, France, Germany, Portugal, Spain, and the United States (“Miembros,” n.d.). Figure 6 displays a sociogram of GAFILAT with isolates removed.

Figure 6. Sociogram of the GAFILAT network

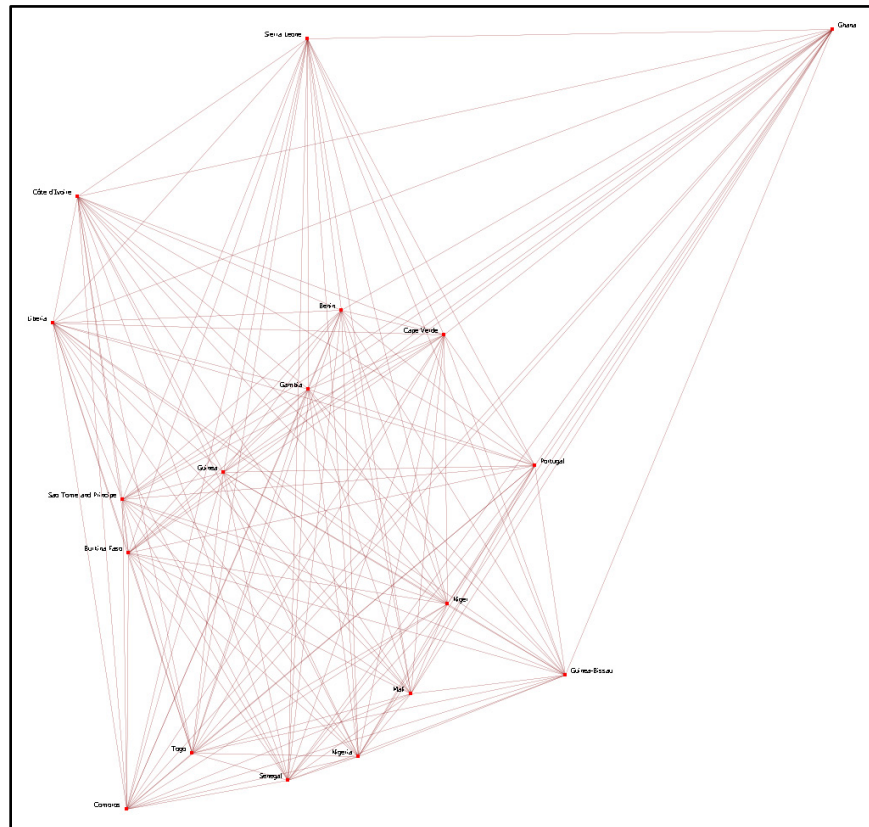


Sociogram of the GAFILAT network with all non-members removed. See Appendix for sources.

7. Inter-Governmental Action Group against Money Laundering in West Africa

The Inter-Governmental Action Group against Money Laundering in West Africa (GIABA) has the lowest density (0.007) reflecting its low participation rate (18 states) and is generally confined to West Africa (“Member states,” n.d.). More worrisome for aggregate network integrity is that this network has only two non-West African states with multiple network membership, Comoros and Portugal, and does not contain actor-by-actor ties with any high income or well-connected states. Figure 7 displays a sociogram of GIABA with isolates removed.

Figure 7. Sociogram of the GIABA network

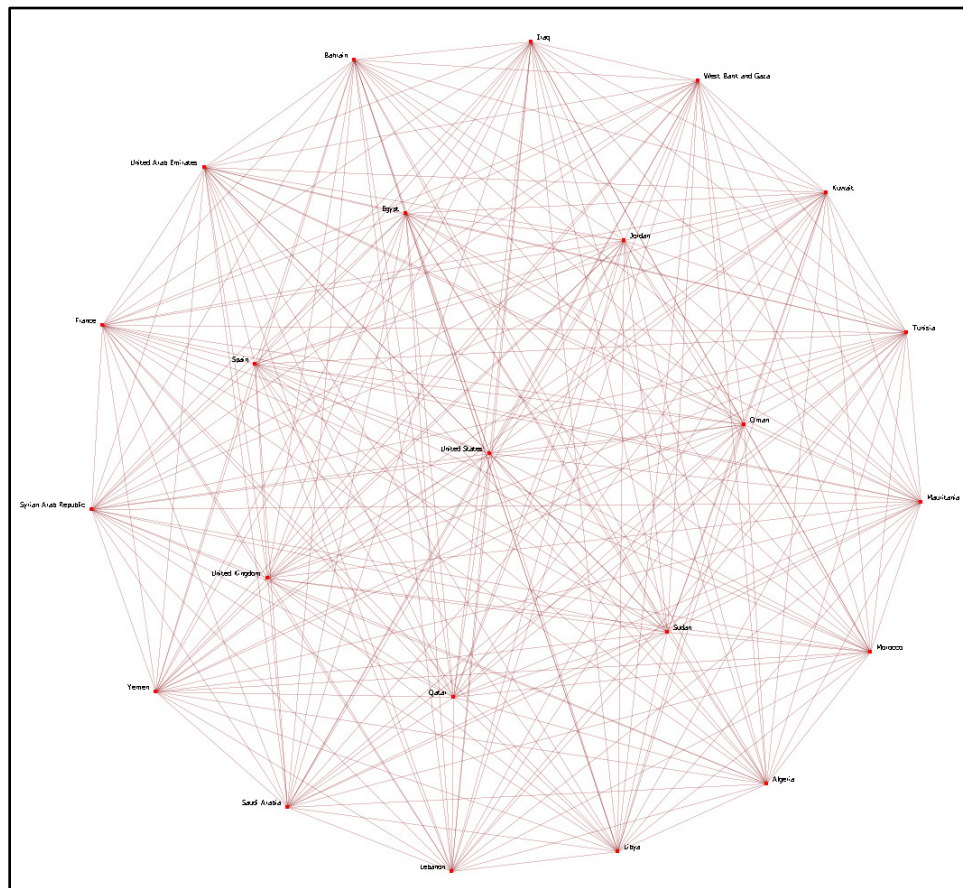


Sociogram of the GIABA network with all non-members removed. See Appendix for sources.

8. Middle East and North Africa Financial Action Task Force

The 23-actor Middle East and North Africa Financial Action Task Force (MENAFATF) network has a low density (0.011) and full-member states reside in the Arab speaking world (“About MENAFATF: Members and observers,” n.d.). Ties to other nations in the aggregate network are strong based on the GCC’s (Kuwait, Bahrain, Saudi Arabia, Oman, U.A.E., and Qatar) membership in the FATF (“FATF members and observers,” n.d.) and links to the United States, France, Spain, and the U.K. This is also the single network membership of Palestine, represented in this sociogram as “West Bank and Gaza”. Somalia, not included in the dataset, is an observer state. Figure 8 displays a sociogram of MENAFATF with isolates removed.

Figure 8. Sociogram of the MENAFATF network

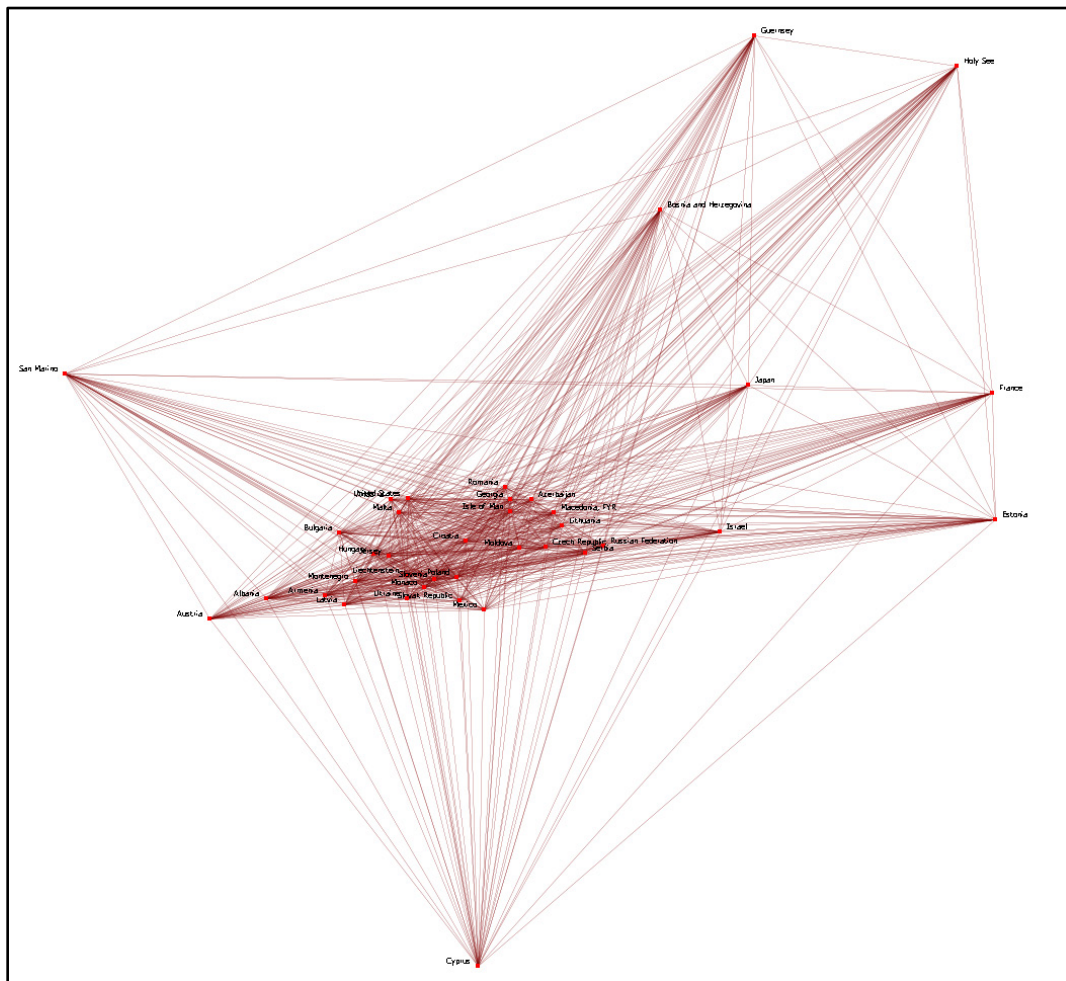


Sociogram of the MENAFATF network with all non-members removed. See Appendix for sources.

9. Committee of Experts on the Evaluation of Anti-Money Laundering Measures and the Financing of Terrorism

The 38 member MONEYVAL network has an above mean density (0.031) and strong EU state membership (“Council of Europe,” n.d., drop-down menu labeled 47 countries). This is also the sole network for some Channel Islands jurisdictions, Israel, and the Vatican (Holy See). Figure 9 displays a sociogram of MONEYVAL with isolates removed.

Figure 9. Sociogram of the MONEYVAL network



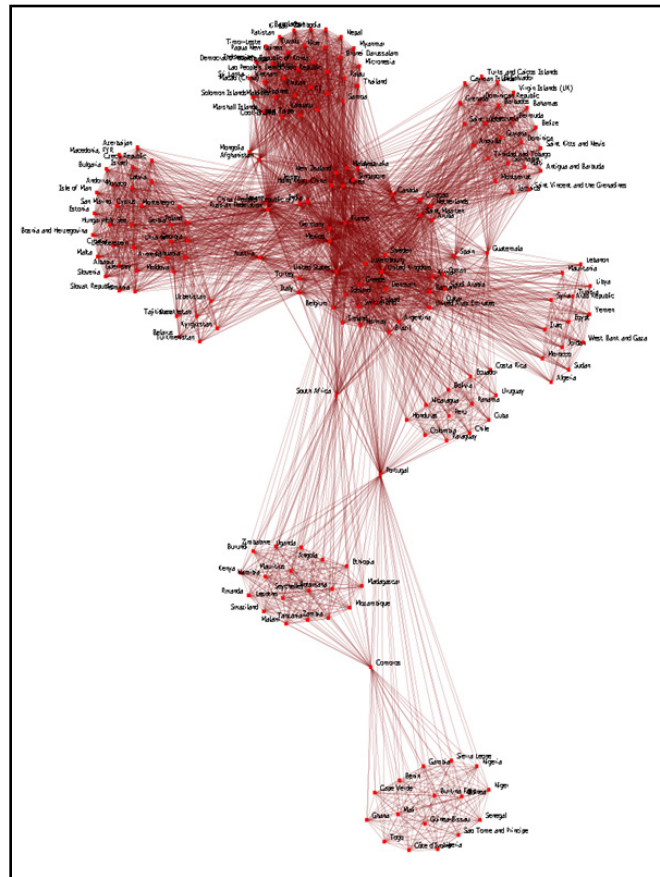
Sociogram of the MONEYVAL network with all non-members removed. See Appendix for sources.

10. The Aggregate FATF/FSRB Network

The aggregate network has over three times the density (0.189) of any single FATF/FSRB network, which is due to high amounts of multiple network membership and therefore actor-by-actor ties.

The aggregate network sociogram in Figure 10 shows the output of a valued dataset with values of ties ranging from one to 32. The diameter/geodesic distance (longest path length between any two actors) is three, indicating relatively short paths between any participating actor. The average distance is 1.874 (meaning that on average a randomly selected actor is tied to another randomly selected actor through one separate actor) with a standard deviation of 0.533.

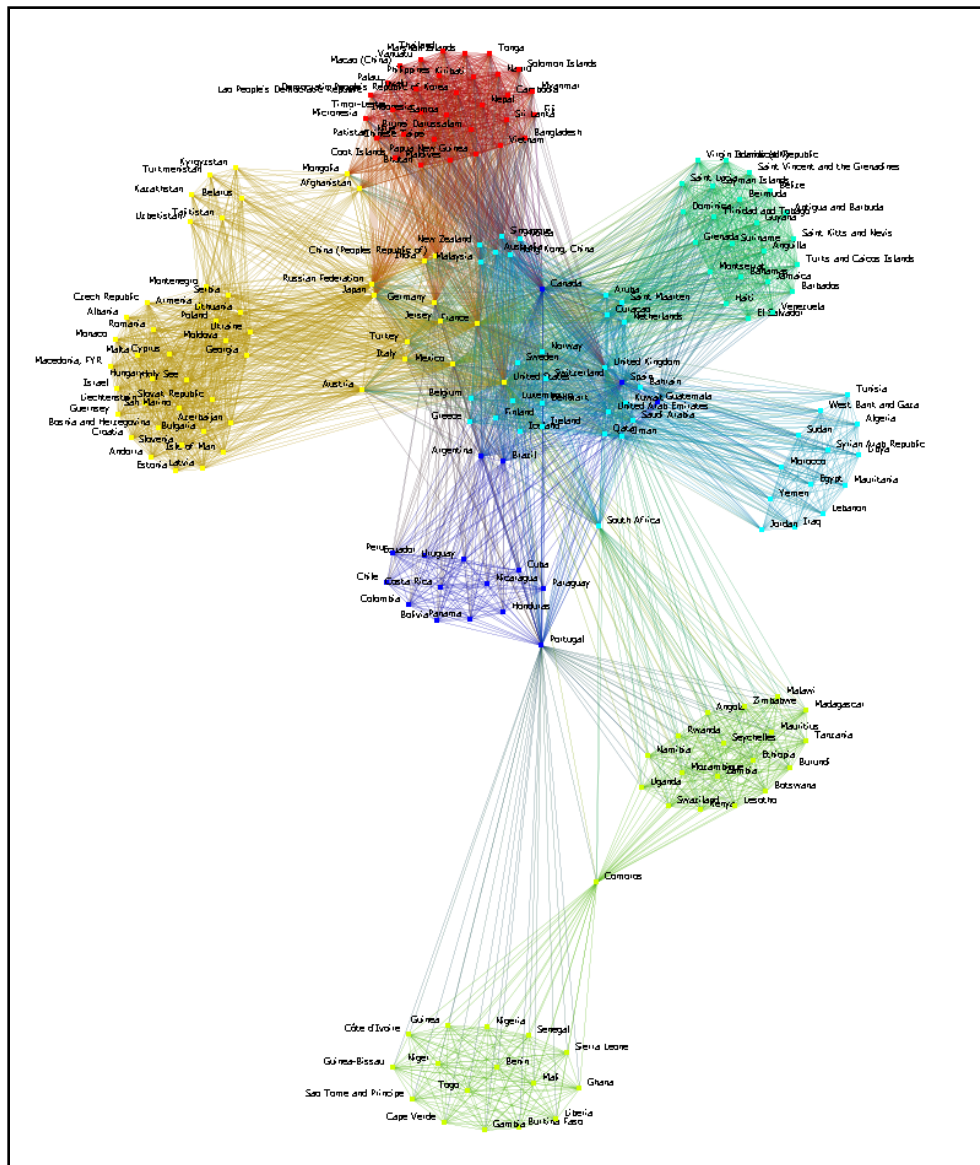
Figure 10. Sociogram of the aggregate network



Sociogram of the aggregate network with isolates removed. See Appendix for sources.

Figure 11 shows the aggregate network with nodes colored by Newman groups (Clauset, Newman, & Moore, 2004). Newman groups is a clustering algorithm that groups actors based on a prevalence of ties within a group and a low number of ties between groups compared to a randomly drawn network with the same number of actors and ties (Everton, 2012, p. 401). Six groups were identified with a Newman modularity of 0.423 as calculated by ORA (Version 2.3.6; Carley, 2011).

Figure 11. Aggregate network with nodes colored by Newman Groups



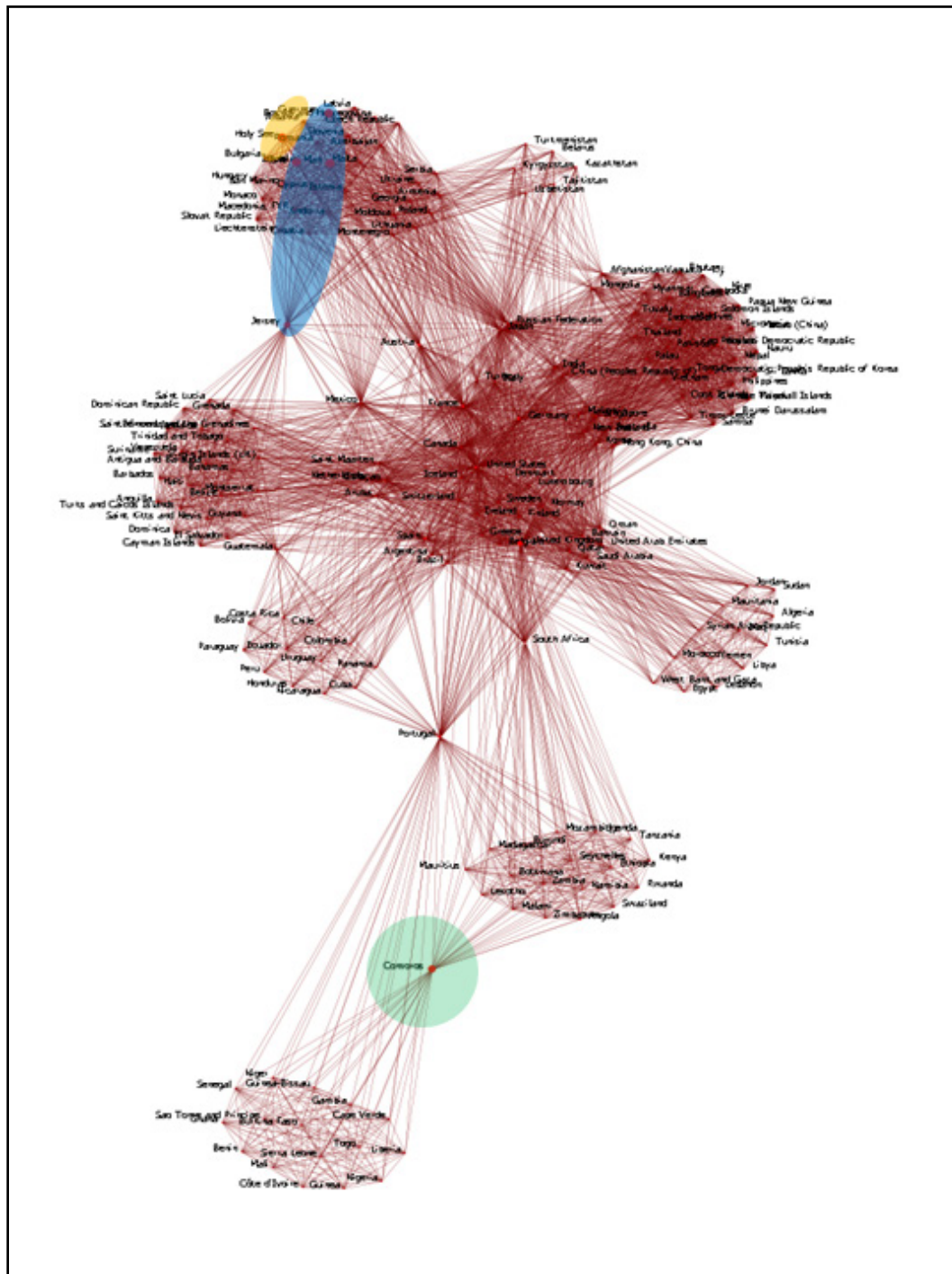
See Appendix for sources.

The Newman groups displayed in Figure 11 are beneficial in their ability to cluster actors based on group ties beyond individual FATF/FSRB network membership. The dark blue towards the center highlights Spanish and Portuguese speaking clusters beyond simple membership in GAFILAT (the exception being Canada's membership in this Newman group). The aqua color on the right side is the Arab speaking world and is grouped to several central nations because of the GCC's multiple membership in the MENAFATF and FATF, effectively bridging the divide. The yellow on the far left mainly consists of actors with sole network membership in MONEYVAL (larger yellow cluster) and EAG nations contained in the smaller yellow cluster slightly above. The dense red in the top center of the sociogram reflects the APG network. The teal on the top right is the Caribbean states with sole membership to CFATF, it is physically pulled closer to the center of the aggregate network because of ties to central actors as previously described. Most disconcerting is the light green displayed at the bottom of the sociogram indicating the distance of the ESAAMLG (bottom right) and GIABA (bottom center) from the rest of the aggregate, these are often described as jurisdictions of high concern and have low and weak actor-by-actor ties to the rest of the aggregate network.

Figure 12 varies node size based on a SNA measure called “boundary spanner, potential,” which is defined in ORA (Version 2.3.6; Carley, 2011) as “the ratio of betweenness centrality to degree centrality.”³ Note that the sociogram appears slightly different as it has been “reenergized” using a spring embedded algorithm. Interestingly, nodes with weak ties existing in Channel Islands jurisdictions, the Vatican, and Israel are shown larger. Jersey (one of the Channel Islands) is also prominent as it has observer status in the CFATF. Comoros is also larger based on its attribute of connecting African states and is especially important as it creates one of the two bridges linking GIABA to the aggregate.

³ Betweenness centrality is a measure of the extent an actor lies on the shortest path between numerous pairs of actors (Everton, 2012, p. 397). Degree centrality is simply the number of ties that an actor has (Everton, 2012, p. 399).

Figure 12. Aggregate network displaying boundary spanner, potential



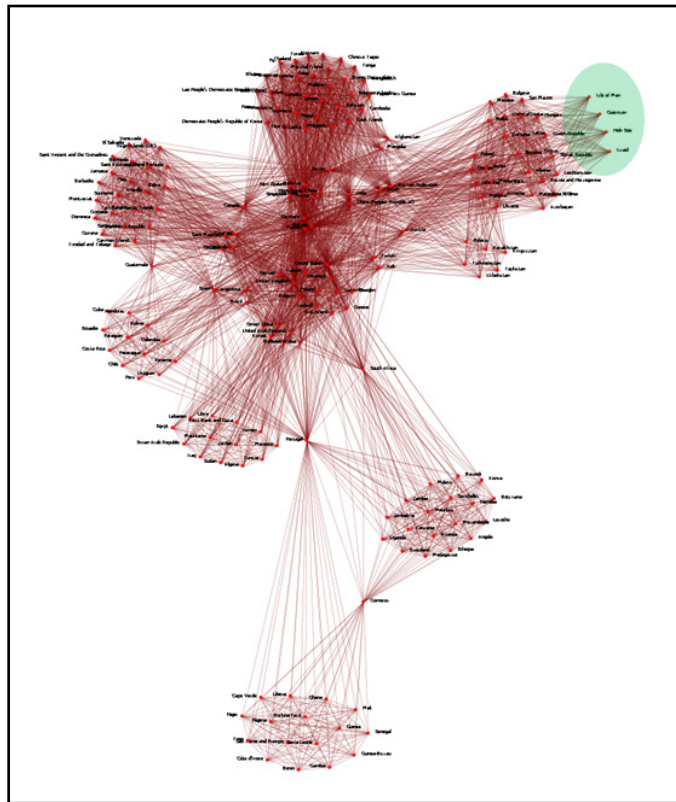
Channel Islands are shaded in blue, Israel and the Holy See are shaded in orange, and Comoros is shaded in green. See Appendix for sources.

11. Network Decay

One method to illustrate and test network resilience is to remove ties based on weight. With isolates removed, the aggregate network contains no single state whose removal fractures the network. Therefore, to manipulate the data in ORA (Version 2.3.6; Carley, 2011) and obtain a visualization of the effects of tie removal, values required for a tie to be displayed can be incrementally increased.

Figure 13 displays the aggregate network with ties of weight less than or equal to 2.0 removed. Texture forms in the MONEYVAL network as the Isle of Man, Guernsey, Israel, and the Holy See begin to distance from the aggregate. Even though the Isle of Man and Guernsey are notable as offshore banking centers, their status as U.K. Crown Dependencies mitigates some risk.

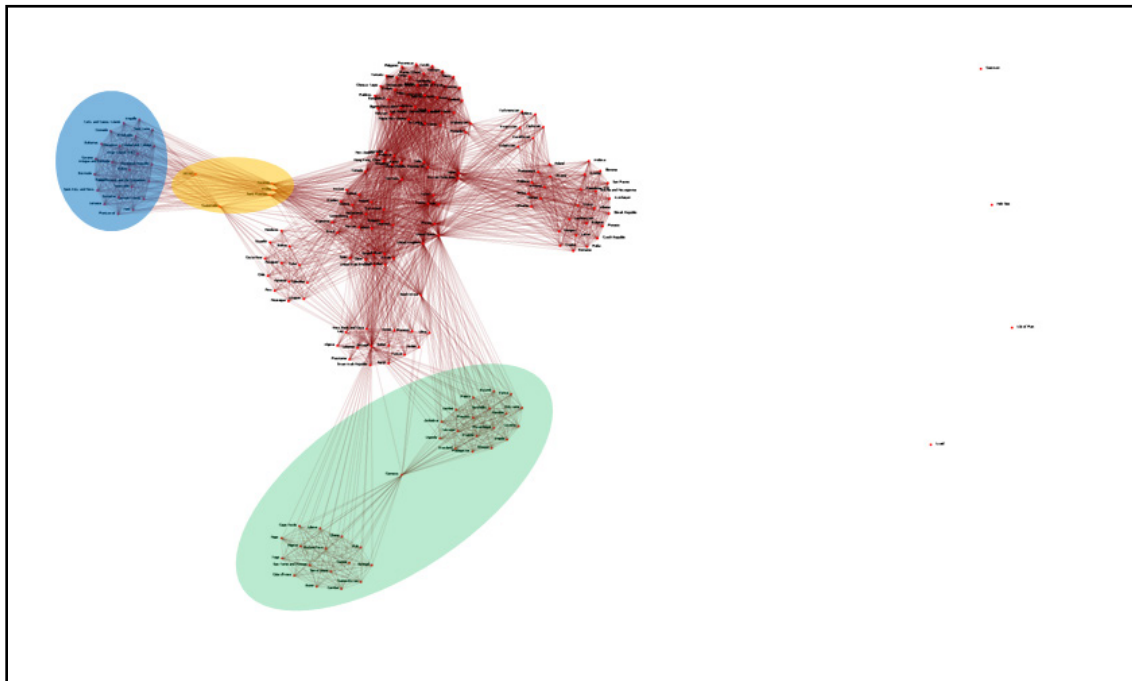
Figure 13. Aggregate network with ties of weight less than or equal to 2.0 removed



Isle of Man, Guernsey, Israel, and the Holy See are shaded in green. See Appendix for sources.

Figure 14 displays the aggregate network with ties of weight less than or equal to 3.0 removed. Isolates appear as they are distanced from the aggregate network (“former” MONEYVAL members discussed in the previous paragraph). CFATF shows a distance comparable to the African states but benefits from multiple strong ties to well-connected countries.

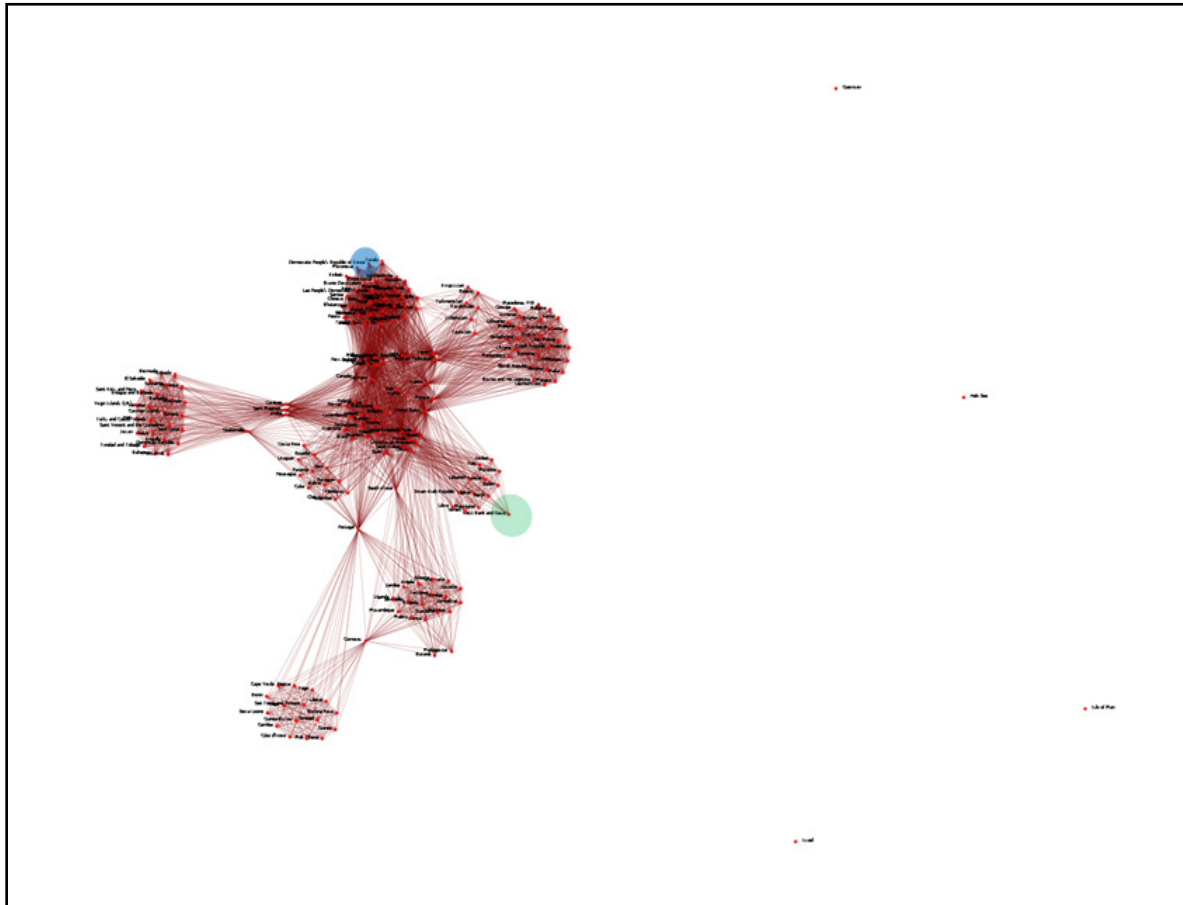
Figure 14. Aggregate network with ties of weight less than or equal to 3.0 removed



New isolates appear on the right. CFATF is shaded in blue, African states are shaded in green, and well-connected states or jurisdictions with membership in CFATF are shaded in orange. See Appendix for sources.

Figure 15 displays the aggregate network with ties of weight less than or equal to 5.0 removed. The resultant effect is texturing appearing in the APG with distancing of the DPRK because of its sole weak tie inherent in its observer status being stressed and West Bank and Gaza likewise beginning to separate from the MENAFATF network.

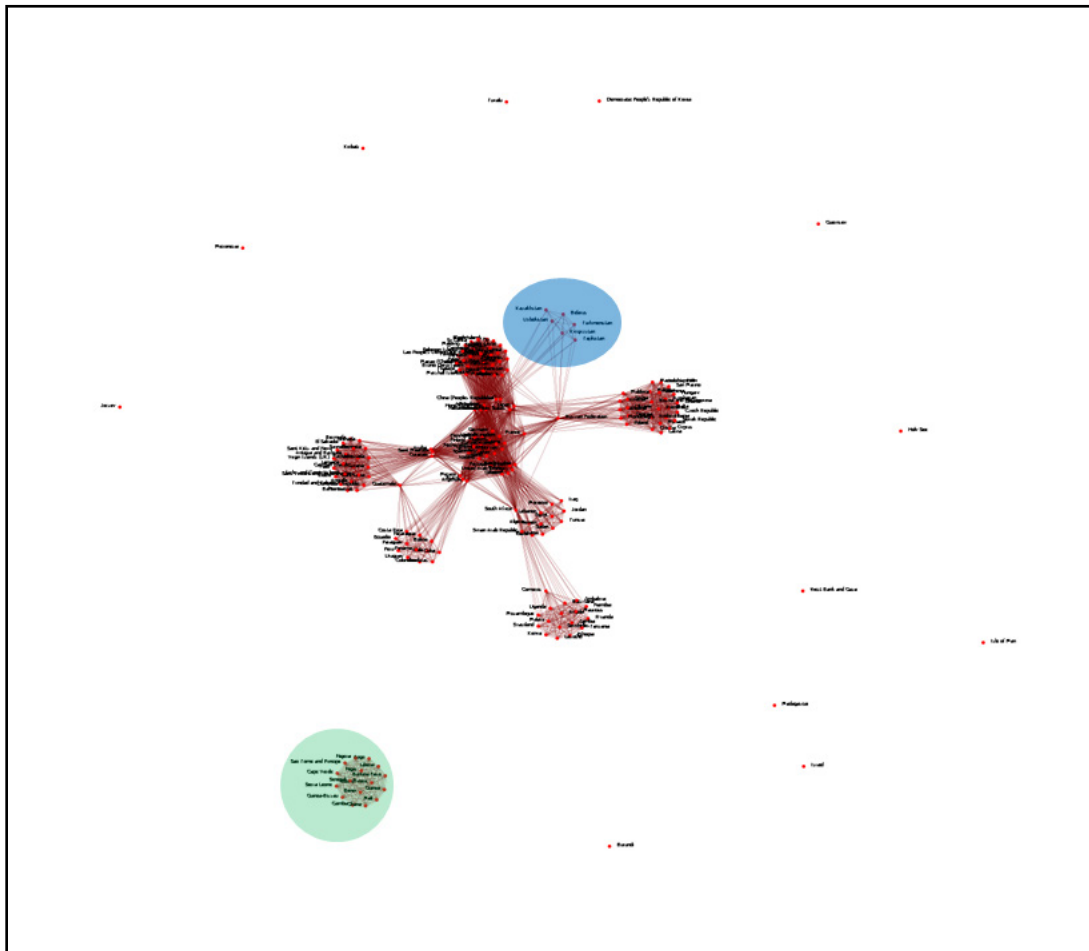
Figure 15. Aggregate network with ties of weight less than or equal to 5.0 removed



DPRK is shaded in blue, West Bank and Gaza is shaded in green. Isolates appear on the right. See Appendix for sources.

Figure 16 displays the aggregate network with ties of weight less than or equal to 6.0 removed. It shows a significant amount of decay as GIABA is entirely separated from the aggregate network after losing all external actor-by-actor ties. A cluster of five Central Asian former Soviet states and Belarus can also be seen beginning to detach. In addition to previously mentioned isolates, Palestine, Burundi, Madagascar, and the DPRK are jurisdictions of concern that have been disconnected.

Figure 16. Aggregate network with ties of weight less than or equal to 6.0 removed



GIABA is shaded in green while Belarus and five Central Asian former Soviet states are shaded in blue. See Appendix for sources.

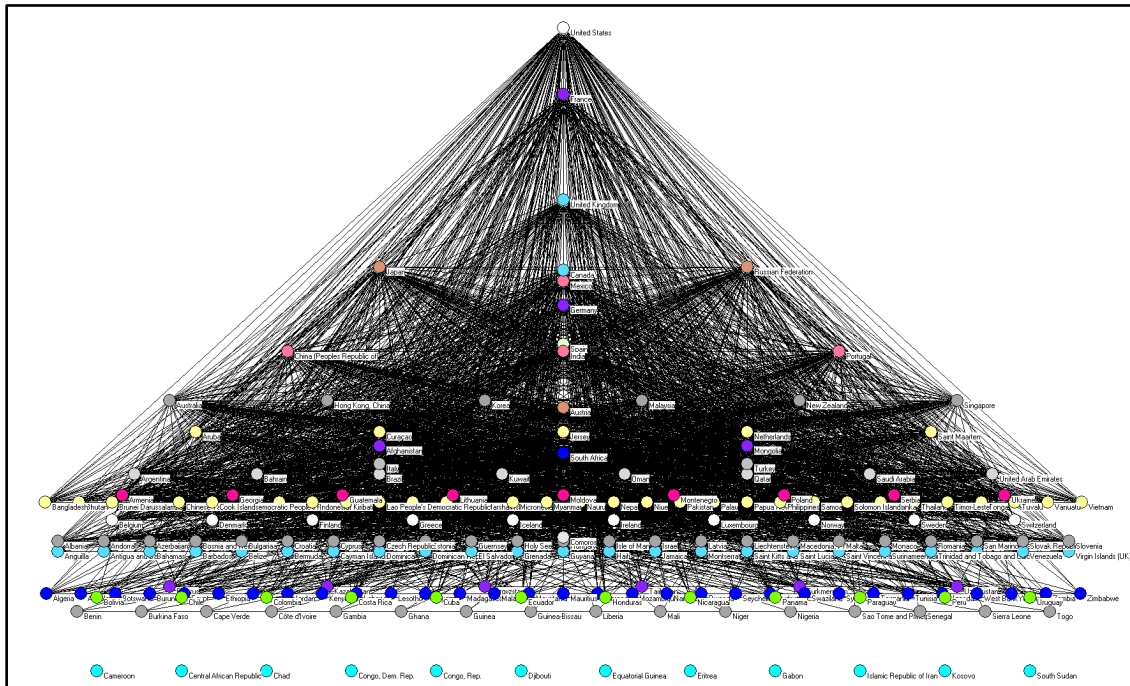
12. Network Visualization Using Attributes

Visualizing the network by degree centrality, the number of ties that an actor has to other actors (Everton, 2012, p. 399), may also be illuminating. Figure 17 was generated in Pajek (Version 3.08; Mrvar & Batagelj, 2012) and layers actors based on their attribute of degree centrality with the actor possessing the most ties (United States) at the top and isolates at the bottom. This figure was generated with all member ties restored. Table 2 supplements the graph in ranking the top five actors in four categories to include:

1. Degree centrality, actors tied to numerous other actors score highly
2. Eigenvector centrality, actors tied to numerous actors with numerous ties score highly (Everton, 2012, p. 400)
3. Betweenness centrality, actors that lie on the shortest path between numerous pairs of actors score highly (Everton, 2012, p. 397)
4. Closeness centrality, actors that are close in terms of path length to other actors score highly (Everton, 2012, p. 398)

It should be noted that degree centrality is dominated by high GDP nations in the FATF, high eigenvector and closeness values are consistent with FATF membership, and betweenness is highly associated with those in the FATF and bridging to the Spanish/Portuguese speaking world.

Figure 17. Actors layered by degree centrality



Layered sociogram generated in Pajek. See Appendix for sources.

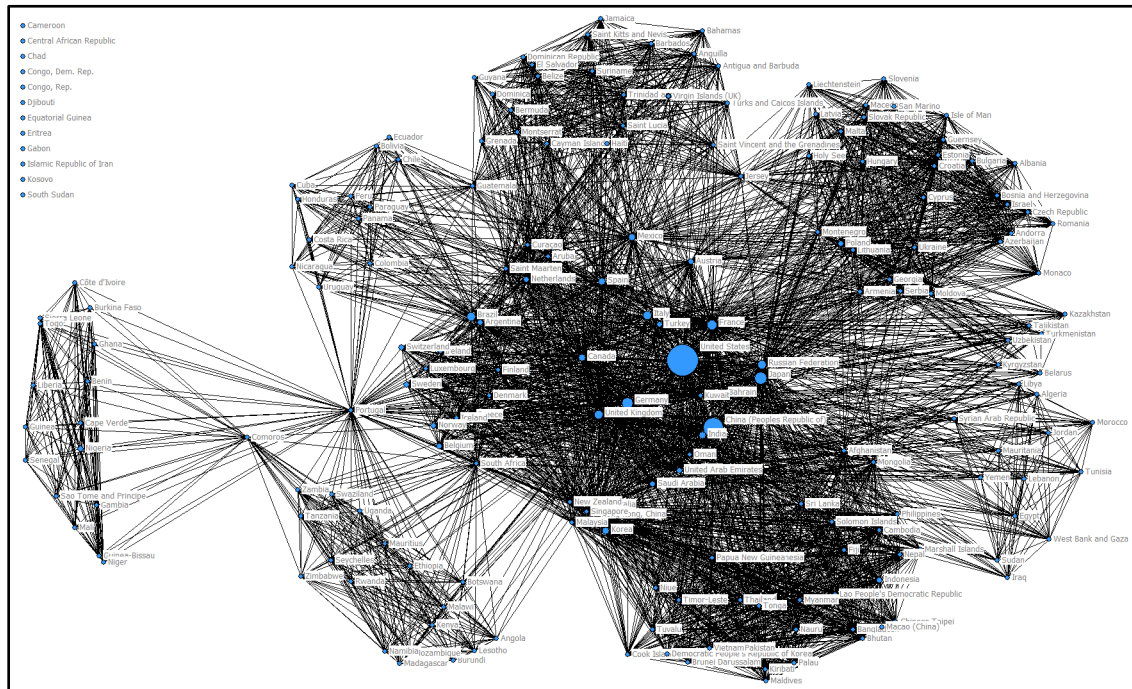
Table 2. Centrality rankings of top five actors

Degree (Raw Score)	Eigenvector (Value)	Betweenness (Value)	Closeness (Value)
1. United States (183)	1. United States (0.272)	1. United States (0.177)	1. United States (0.076)
2. France (164)	2. France (0.266)	2. Portugal (0.130)	2. France (0.076)
3. United Kingdom (134)	3. Japan (0.288)	3. France (0.094)	3. United Kingdom (0.075)
4. Japan (115)	4. Russian Federation (0.228)	4. United Kingdom (0.075)	4. Japan (0.075)
5. Russian Federation (115)	5. United Kingdom (0.227)	5. Mexico (0.033)	5. Russian Federation (0.075)

See Appendix for sources.

Figure 18 was generated in NetDraw (Version 2.139; Borgatti, 2002) and sizes nodes by GDP. This gives a quick visualization of individual actor's structural location and a reference to economic size. While labels in the figure are difficult to read, the intent is to visualize the high GDP actors as being physically central in the aggregate network. This is also reflective of FATF membership exclusivity and the developing world status of many peripheral actors.

Figure 18. Sociogram of aggregate network with nodes sized by GDP attributes



Sociogram generated in NetDraw. Larger nodes are indicative of a higher GDP as central actors in the network are generally part of the developed world. See Appendix for sources.

C. STRATEGIC OPTIONS FOR RESILIENCE AND TARGETING

The choice of strategic options open to the analyst are channeled and informed by the analysis conducted on the network. This section discusses potential strategies that can be used for promoting network resilience and policy targeting for at-risk jurisdictions.

1. Resilience

An important aspect to the FATF/FSRB network is the concept of self-determination and the individual actor's active choice to be part of the individual network or networks. Mandating membership may have the effect of creating a solid crystalline or lattice structure but also would likely have the adverse effect of straining voluntary participation as the network characteristics based off actors' common characteristics' and unique economic vulnerabilities would be diluted. It should be noted that a common

thread to the following three strategies emphasize the value of observer membership, or weak ties.

1. Observer status on an actor level could be encouraged in order to strengthen the network by bridging various sections of the aggregate network. When looking at the aggregate network on an actor-by-actor level, it can be easily noted that “all bridges are weak ties (Granovetter, 1973, p. 1364).” This is apparent in the observer membership of Comoros bridging the two African FSRBs or the tenuous nature inherent in single network status (e.g., Israel’s single weak tie to MONEYVAL). Observer status may not weaken the characteristics inherent in many networks and would effectively bridge FSRBs and allow for more actor-by-actor ties.
2. The negative effect of structural holes in the aggregate network could be mitigated by encouraging redundancy of ties. While some FSRBs contain multiple strong connections to the aggregate (e.g., APG), other networks with high risk actors like GIABA have a very low quantity of actor-by-actor ties. When the network decays as shown in Figures 13 through 16, CFATF can be shown increasing its distance from central actors but does not result in the same dire effects as GIABA because of a redundancy in ties. While Burt (1992) argues the advantages of brokerage nested in a lack of redundant ties, a resilient policy network could be at a great risk of destabilizing effects by allowing too much influence in a single actor.
3. Reach out to isolate actors and encourage application to a FSRB. This is the “low-hanging fruit” of strategies to bring in at-risk jurisdictions. The benefits include encouragement of state level AML/CFT legislation, implementing efforts based off of FATF recommendations, actor-by-actor ties to these same at-risk jurisdictions, and how the networks and other actors already present in these networks can shape and influence the new member similar to the network rules of Christakis and Fowler (2009). The major hurdle in this third strategy is the willingness of the isolate or current network members to allow the new tie. Prior to 2014, the DPRK was an isolate until it received observer status in the APG (“Democratic Peoples’ Republic of Korea,” n.d.). Regardless of its affiliation, the strength of the weak tie is questionable as it possibly only creates nominal actor-by-actor ties. Using the same logic, integrating Iran may be questionable in its ultimate benefits and potential state reluctance to join.

2. Policy Targeting

The FATF frequently conducts mutual evaluations of member jurisdictions, publishes and updates recommendations, and publishes typology reports highlighting vulnerabilities. A single strategy for exhaustive identification of all at risk jurisdictions simply does not exist but SNA can provide a method of identification for probable high

threat regions. While all actors have some level of vulnerability to their financial systems being exploited by nefarious groups or persons, actors identified as only having weak ties and actors that are isolated can be readily identified as being at a higher risk. Using a risk-based analysis, individual FSRBs can also respond to unique economic and financial threats.

Based upon Christakis and Fowler's (2009) theories on influence and the value of closeness, actor-by-actor ties can be utilized to strengthen at-risk jurisdictions. Working on the postulate that influence spreads and the network's characteristics shape the actors within, policy and recommendations can also be targeted to actors close to those that are at-risk.

D. SUMMARY

SNA is not a perfect tool for understanding the complexities and nuances of international relations and the AML/CFT environment, but it does allow in depth analysis of the underlying structures and characteristics of networks. Theory developed in the field through extensive research also assists in the explanation of the constraints and influence placed on actors, network efficiencies and effects, and enables an analysis of structural characteristics that may not be readily apparent.

While the presence of IGO representation in regional networks is valuable in creating a robust network and fruitful cooperation, follow-up action and legislation must be taken by the individual actor. Analyzing the aggregate FATF/FSRB network on an actor-by-actor basis yields the potential for viable strategies in shaping the AML/CFT landscape and further increasing its resilience.

VI. FINDINGS AND CONCLUSION

A robust policy network and recognition of factors contributing to the illicit use of gold throughout the operational chain greatly assists in financial sector stability and defining responses to tangible threats. This chapter presents available responses to counter the illicit use of gold, identifies current policy vulnerabilities affecting this commodity, potential methods to promote operational chain stability, and areas of further research that can be developed.

A. FINDINGS

This section presents research-based findings and methods to identify and disrupt the use of gold in threat financing operations, and policy suggestions to guide potential IGO recommendations and government policy implementation. A risk-based approach dominates the tactics that are used; regions with difficulty presented from informal or illicit economies in upstream operations are frequently those suffering from ungoverned spaces and lax controls, while downstream markets with large demand are often found in regions of at least relatively capable governance. Because of this dichotomy, varying approaches must be used to individual combat the ills of the operational chain while realizing that even informal economies may have positive contributions.

1. Operational

Recognition of the precursors to illicit mining activities and the effects created by its presence is likely the most important step to ensuring legitimacy throughout the operational chain. While smuggling operations, laundering activities, and the shadowy transfer of funds between criminal and terrorist enterprises can be highly damaging, the scale of government tax revenue lost, legitimate industry avoidance in developing economies, and propensity for illicit economies to flourish in this environment far outweigh the downstream risks. Recognizing the presence of these illicit economies, conducting analysis of trade discrepancies, and dismantling peripheral activities are all potential opportunities for promoting a secure market and preventing its misuse.

a. *Recognition of Illicit Mining*

Recognition of illicit mining activities is necessary in a risk-based approach to counter fundraising in upstream operations. While not illegal in all circumstances, ASM operations are higher-risk activities that are often found alongside human-rights violations (Verité, 2012), damaging environmental processes (Blacksmith Institute, 2010), potential exploitation by armed groups, and exposure to smuggling operations (OECD, 2013, p. 71).

Observable indicators of local ASM operations may take the form of small-scale mercury sales catering to ASM miners using mercury amalgamation (Blacksmith Institute, 2010), cash-for-gold operations accepting raw gold or gold doré (Verité, 2012), and environmental damage including clear-cutting of vegetation, scarring of resource-exploited land, and animal die-off from mercury pollution (Elbein, 2015; Verité, 2012). While these operations are prone to occur in areas of lax or absent governance, these cues to illegal ASM operations are readily apparent.

b. *Trade Transparency Units*

TTUs can be used to identify discrepancies in trade data between countries (Cassara & Jorisch, 2010, p. 68). Occurring in downstream operations, smuggling and misrepresentation of goods and quantities shipped may easily allow for value to be siphoned off and used for nefarious purposes, obscure the quantity imported from a questionable origin, or used to evade import taxes. The examination of corresponding import and export documentation provides the opportunity to analyze discrepancies and patterns of misrepresentation that may be indicative of TBML or smuggling (Cassara & Jorisch, 2010, pp. 69-74).

Data gathered by TTUs and shared with FIUs may also present indicators of illicit sourcing. In the case of the greater African Great Lakes region where gold is smuggled from the source country to an intermediate stop before export, TTU data on exports can be matched to mining estimates to establish if the claimed origin is likely false. The OECD (2013, p. 79) highlights excessively-claimed origin in a country with low output as one of their red flag indicators for illicit sourcing.

c. Dismantling Illicit Economies

The displacement of large populations to former sparsely populated regions and capital investment on any scale can form illicit economies that surround mining operations. Verité (2012) gives an in-depth description of human trafficking for prostitution and menial labor, debt bondage, and services provided at ad hoc mining encampments. Illegal mining operations attract an informal economy that operates without regulation.

Combating the activities surrounding illegal mining may limit production capabilities. As evidenced in informal mining towns like La Rinconada (Finnegan, 2015), inhospitable climates and remote locations necessitate ancillary operations whose regulation can stifle the primary operation. Second-order effects on illegal mining operations can also be achieved through efforts at combating human trafficking and blocking the import of necessary machinery and chemicals to at-risk regions.

2. Policy

Operational capabilities are generally focused on financial sector security through the denial of informal and illicit economies that are most vulnerable to laundering activities and illicit finance. This hardline approach of focusing on denial presents short-term positive effects (i.e., enforcing formalization of miners in Peru and destroying equipment of those whom are non-compliant), but intermediate effects may result in recidivism to informal or illegal practices and long-term effects may include a further economic depression in a region with few legitimate alternatives and possible social upheaval causing further instability.

Policy efforts are often contingent on the established presence of rule of law and the capability of governance. They also create a stable market environment that can affect the upstream operations by focusing demand on legitimate sourcing options and discouraging the use of questionable activities. The FATF, individual governments, and industry groups all have the ability to promote legitimacy and can take on a nuanced approach that combats illicit activities while defending the opportunities of those workers and disadvantaged populations with few legitimate alternatives.

a. FATF

FSRB membership should be universally encouraged, especially for high-risk states. Four of the eleven isolate states, the DRC, CAR, Republic of the Congo, and Cameroon, are all within the greater African Great Lakes region or are used as gold smuggling routes from the region. While FATF recommendations do not carry the weight of law, exposure through regional forums and mutual evaluations of existing economic environments and legislation could increase transparency and promote the establishment of stronger AML/CFT efforts.

The *FATF Recommendations* are also incomplete in countering illicit financing with gold and other commodities. Recommendations 22 and 23 apply specifically to DNFBPs (FATF, 2012, pp. 19-20), but focus entirely on the dealers in downstream operations and gold's intersection with cash transactions. While it is useful to file CTRs and SARs with FIUs, much of the risk of terrorist and criminal financing comes from upstream operations in locations where CTRs and SARs are not practicable and among parties that would never file these reports. Recommendations should be added to ensure that downstream DNFBPs are required to follow due-diligence procedures in their sourcing.

b. Government

Government policy needs to reflect how gold is a high-liquidity currency that easily intersects with other forms of threat financing, how it establishes vast illicit economies, and how it may be the only source of livelihood for workers from disadvantaged populations. Unfortunately, there is immense difficulty in balancing these imperatives with large demand, lack of legitimate economic opportunities, and ineffective governance.

The U.A.E.'s ongoing attempt at registering the hawala system recognizes the need for accountability in documenting the direction, parties, and amounts of funds transferred, but neglects the key question of how the books are balanced between hawaladars. Gold being a common method of account settlement (Cassara & Jorisch, 2010, pp. 100–101), the hawala registration documentation and reports on remittances

(Central Bank of the United Arab Emirates, 2003, slides 8, 12, and 14) do track customers and require the hawaladar to report the nature of their business, but they do not require specifics on account settlement methods. While it may be assumed that a souk merchant would use gold imports and exports for settlement of hawala accounts, the valuation of these transactions needs to be monitored to reduce the likelihood of tariff avoidance, money laundering, and terrorist financing.

Attacking the constituent elements of illicit economies is an indirect approach to reducing the supply of illicitly mined gold, but may have the additional benefits of blocking exploitation by criminal elements. Even in the primitive conditions of ASM operations in the CAR, DRC, and parts of Peru, large support operations for the miners and intricate smuggling networks for integration of illicitly mined gold into the legitimate supply is necessary. As laundering activities and illicit finance are often predicate offences for illegal operations, there must be awareness that the predicate functions required to be in place for mining operations are often also controlled by criminal elements and nefarious groups.

A balance must also be made between completely shutting off illegal and informal mining operations and letting them run freely. While efforts like the Dodd-Frank Wall Street Reform Act of 2010 make it attractive to entirely avoid sourcing 3TG minerals from conflict-affected regions, conflict-free ASM operations within the African Great Lakes region also provides one of the only sources of livelihood in an otherwise economically desolate area. PwC (2013a, p. 17) documented this economic question in that they estimate the approximately five-million ASM gold miners worldwide make an assumed U.S. \$10 per day which is generally well above other wage sources in depressed communities. Efforts to formalize mining operations (e.g., Peru) or create obstacles to sourcing from conflict-affected regions must take precautions to avoid extinguishing all economic opportunity.

c. Industry

Adoption of industry best practices from mine to market is beneficial when they are used throughout the operational chain. The WGC's (2012) Conflict-Free Gold

Standard, the DMCC's (2012) Practical Guidance, the LBMA's (2013) Responsible Gold Guidance, and the Responsible Jewellery Council's (2013) Code of Practices all champion a risk-based approach to identifying conflict sourcing, human rights abuses, and the potential for terrorist financing. Industry self-regulation and policing efforts shoulder some of the burden of AML/CFT efforts, can assist in the starvation of demand from illicit economies, and provide practical solutions from industry experts.

Adoption of these standards should be encouraged whenever possible. A leading risk to their failure is a break in due-diligence; if miners and refiners are not upholding their due-diligence efforts or misrepresenting their claims, downstream markets' and other operations' due-diligence efforts will likewise be negatively impacted.

B. CONCLUSION

Gold can be used to launder criminal proceeds, transfer value between nefarious actors with a high degree of anonymity, settle accounts in IVTS, fund armed insurgencies through the control of mining activities, destroy workers health and the environment, contribute to human trafficking, and stunt positive infrastructure growth in developing economies. It also provides a means of diversification for central banks, a multi-billion dollar global trade, a hedge against inflation for investors, and an income source, both direct and indirect, for millions of workers. Unique risks are present in all segments of the operational chain from mine to market and among different geographic regions. The misuse of gold, like in many CTF subjects, has the major commonality of being transnational in scope.

This thesis presented an overview of the operational chain and its vulnerabilities, specific regional cases of abuse throughout the chain, policy efforts aimed at promoting a stable market supporting legitimate activity, the FATF/FSRB network that promotes this stability, and research-based findings. While this research was intentionally limited in scope to the operations, vulnerabilities, and policies related to gold; additional research could be conducted into the intersection of gold with other money laundering and terrorist financing methods, the net effects of shutting down or criminalizing informal

economies, the instability caused by 3TG and other resources, or the effectiveness of present AML/CFT efforts in combating a highly liquid and anonymous commodity.

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APPENDIX. COMPILED DATASET AND SOCIOGRAM SOURCES

This appendix describes the 212 actor dataset compiled from multiple online sources that is extensively used throughout Chapter V and the SNA software that was used to generate sociograms and select metrics. The intent is not to provide new information, but instead to provide credit for the information and provide insight into the data used to generate the figures.

A. DATASET

The compiled dataset consists of 212 actors (state or jurisdiction) and are listed in Table 3. The first column of the table gives the name of the state or jurisdiction, while the last column presents its GDP in millions of U.S. dollars. The nine columns in between represent the FATF or one of the FSRBs with the first row providing labels one through nine and the following rows are assigned a blank, or the number one, two, or three. One represents “other” status, two represents “observer” status, and three represents “member” status. Table 1 in Chapter V was created by naming the states or jurisdictions that are not a FATF/FSRB member in the compiled dataset.

Information collected for the center nine columns comes from 10 websites. Multiple sources were used in all cases except the FATF network membership to check if there was a discrepancy between information, and in the case that they were not identical, the membership lists were combined. The following list is numbered to indicate the column number matching the dataset, the name of the body, and a reference of where the information was obtained:

1. FATF

FATF members and observers. (n.d.). Retrieved May 3, 2015, from <http://www.fatf-gafi.org/pages/aboutus/membersandobservers/>

2. APG

Members & observers. (n.d.). Retrieved May 30, 2015, from <http://apgml.org/members-and-observers/page.aspx?p=8c32704a-5829-4671-873c-7b5a23ced347>

3. CFATF

Member countries. (n.d.). Retrieved May 30, 2015, from <https://www.cfatf-gafic.org/index.php/member-countries>

4. EAG

Eurasian Group on Combating Money Laundering and Financing of Terrorism. (n.d.). Retrieved May 30, 2015, from <http://www.eurasiangroup.org/>

5. ESAAMLG

Eastern and Southern Africa Anti-Money Laundering Group. (n.d.). Retrieved May 30, 2015, from <http://esaamlg.org/>

6. GAFILAT

Miembros. (n.d.). Retrieved May 30, 2015, from <http://www.gafilat.org/content/observadores/>

7. GIABA

Member states. (n.d.). Retrieved May 30, 2015, from http://www.giaba.org/member-states/index_653.html

8. MENAFATF

About MENAFATF: Members and observers. (n.d.). Retrieved May 30, 2015, from <http://menafatf.org/topiclist.asp?ctype=about&id=430>

9. MONEYVAL

Council of Europe. (n.d.) Retrieved May 30, 2015, from <http://www.coe.int/t/dghl/monitoring/moneyval/>

The table at the following source was also a reference for all columns in the compiled dataset:

Countries. (n.d.). Retrieved May 3, 2015, from <http://www.fatf-gafi.org/pages/aboutus/membersandobservers/>

The GDP data was taken from two sources: the World Bank and the CIA's *The World Factbook*. The World Bank's dataset was consulted first but was missing data on 19 actors used in the compiled dataset. These countries or jurisdictions missing were Anguilla, Aruba, Cayman Islands, Cook Islands, Curaçao, DPRK, Guernsey, Holy See, Isle of Man, Jersey, Monaco, Montserrat, Nauru, Niue, San Marino, Sint Maarten, Syrian Arab Republic, Turks and Caicos, and the Virgin Islands (U.K.). Their GDP data was

retrieved from their respective country page in *The World Factbook*. The references are as follows:

The World Bank. (2015b). Gross domestic product 2014 [pdf]. Retrieved May 3, 2015, from <http://databank.worldbank.org/data/download/GDP.pdf>

Central Intelligence Agency. (2015). *The World Factbook* [data base]. Retrieved May 3, 2015, from <https://www.cia.gov/library/publications/resources/the-world-factbook/>

Table 3. Compiled Dataset

State or Jurisdiction	1	2	3	4	5	6	7	8	9	GDP (millions U.S. \$)
Afghanistan		3		2						20,310
Albania									3	12,923
Algeria								3		210,183
Andorra									3	4,800
Angola					3					124,178
Anguilla			3							175
Antigua and Barbuda			3							1,201
Argentina	3					3				609,889
Armenia				2					3	10,432
Aruba	3		3							2,584
Australia	3	3								1,560,372
Austria	3								1	428,322
Azerbaijan									3	73,560
Bahamas			3							8,420
Bahrain	3							3		32,890
Bangladesh		3								149,990
Barbados			3							4,225
Belarus				3						71,710
Belgium	3									524,806
Belize			3							1,624
Benin							3			8,307
Bermuda			3							5,474
Bhutan		3								1,781
Bolivia						3				30,601
Bosnia and Herzegovina									3	17,851
Botswana					3					14,785
Brazil	3					3				2,245,673
Brunei Darussalam		3								16,111

Bulgaria								3	54,480
Burkina Faso						3			12,885
Burundi				2					2,715
Cambodia		3							15,239
Cameroon									29,568
Canada	3	3	1		2				1,826,769
Cape Verde						3			1,879
Central African Republic									1,538
Cayman Islands			3						2,250
Chad									13,514
Chile					3				277,199
China (Peoples Republic of)	3	3		3					9,240,270
Chinese Taipei		3							505,500
Colombia					3				378,415
Comoros				3		2			599
Congo, Dem. Rep.									32,691
Congo, Rep.									14,086
Cook Islands		3							183
Costa Rica					3				49,621
Croatia								3	57,869
Cuba					3				68,234
Curaçao	3		3						5,600
Cyprus								3	21,911
Czech Republic								3	208,796
Côte d'Ivoire						3			31,062
Democratic People's Republic of Korea		2							28,000
Denmark	3								335,878
Djibouti									1,456
Dominica			3						517
Dominican Republic			3						61,164
Ecuador					3				94,473
Egypt							3		271,973
El Salvador			3						24,259
Equatorial Guinea									15,581
Eritrea									3,444
Estonia								3	24,880
Ethiopia				3					47,525
Fiji		3							3,855
Finland	3								267,329
France	3	2	1	2		2		2	2,806,428

Gabon										19,344
Gambia							3			903
Georgia				2					3	16,140
Germany	3	2		2		2				3,730,261
Ghana							3			48,137
Greece	3									242,230
Grenada			3							836
Guatemala			3			3				53,797
Guernsey									1	2,742
Guinea							3			6,144
Guinea-Bissau							3			961
Guyana			3							2,990
Haiti			3							8,459
Holy See									1	-
Honduras							3			18,550
Hong Kong, China	3	3								274,013
Hungary									3	133,424
Iceland	3									15,330
India	3	3		3						1,875,141
Indonesia			3							868,346
Iraq								3		229,327
Ireland	3									232,077
Islamic Republic of Iran										368,904
Isle of Man									1	4,076
Israel									1	290,551
Italy	3			2						2,149,485
Jamaica			3							14,362
Japan	3	3		2					2	4,919,563
Jersey			2						1	5,771
Jordan								3		33,679
Kazakhstan				3						231,876
Kenya					3					55,243
Kiribati			2							169
Korea	3	3								1,304,554
Kosovo										7,072
Kuwait	3							3		175,831
Kyrgyzstan				3						7,226
Lao People's Democratic Republic			3							11,243
Latvia									3	30,957
Lebanon								3		44,352

Lesotho				3					2,335
Liberia						3			1,951
Libya							3		74,200
Liechtenstein								3	5,113
Lithuania			2					3	45,932
Luxembourg	3								60,131
Macao (China)		3							51,753
Macedonia, FYR								3	10,195
Madagascar				2					10,613
Malawi				3					3,705
Malaysia	2	3							313,159
Maldives		3							2,300
Mali						3			10,943
Malta								3	9,642
Marshall Islands		3							191
Mauritania							3		4,158
Mauritius				3					11,929
Mexico	3		1		3			2	1,260,915
Micronesia		2							316
Moldova			2					3	7,970
Monaco								3	6,075
Mongolia		3	2						11,516
Montenegro			2					3	4,416
Montserrat			3						43
Morocco							3		103,836
Mozambique				3					15,630
Myanmar		3							65,290
Namibia				3					13,113
Nauru		3							60
Nepal		3							19,294
Netherlands	3		1						853,539
New Zealand	3	3							185,788
Nicaragua					3				11,256
Niger						3			7,407
Nigeria						3			521,803
Niue		3							10
Norway	3								512,580
Oman	3						3		79,656
Pakistan		3							232,287
Palau		3							247

Panama					3				42,648
Papua New Guinea		3							15,413
Paraguay					3				29,009
Peru					3				202,350
Philippines		3							272,067
Poland				2				3	525,866
Portugal	3				2	2	2		227,324
Qatar	3							3	203,235
Romania								3	189,638
Russian Federation	3	2		3				3	2,096,777
Rwanda					3				7,521
Saint Kitts and Nevis			3						766
Saint Lucia			3						1,336
Saint Maarten	3		3						304
Saint Vincent and the Grenadines			3						709
Samoa		3							802
San Marino								3	1,858
Sao Tome and Principe							3		311
Saudi Arabia	3							3	748,450
Senegal							3		14,792
Serbia				2				3	45,520
Seychelles					3				1,443
Sierra Leone							3		4,136
Singapore	3	3							297,941
Slovak Republic								3	97,707
Slovenia								3	47,987
Solomon Islands		3							1,096
South Africa	3				3				366,058
South Sudan									11,804
Spain	3		1			2		2	1,393,040
Sri Lanka		3							67,182
Sudan								3	66,566
Suriname			3						5,299
Swaziland					3				3,791
Sweden	3								579,680
Switzerland	3								685,434
Syrian Arab Republic								3	64,700
Tajikistan				3					8,508
Tanzania					3				43,647
Thailand		3							387,252

Timor-Leste		3								1,270
Togo							3			4,339
Tonga		3								466
Trinidad and Tobago			3							24,641
Tunisia								3		46,994
Turkey	3			2						822,135
Turkmenistan				3						41,851
Turks and Caicos Islands			3							632
Tuvalu		2								38
Uganda					3					24,703
Ukraine				2					3	177,431
United Arab Emirates	3							3		402,340
United Kingdom	3	2	1		2			2		2,678,455
United States	3	3	1	2	2	2		2	2	16,768,100
Uruguay						3				55,708
Uzbekistan				3						56,796
Vanuatu		3								828
Venezuela			3							438,284
Vietnam		3								171,390
Virgin Islands (UK)			3							1,095
West Bank and Gaza								2		11,262
Yemen								3		35,955
Zambia					3					26,821
Zimbabwe					3					13,490

B. SOCIOGRAMS AND SOURCES OF SELECT METRICS

The sociograms were generated using the compiled dataset and three different SNA software programs: for Figure 18, NetDraw (Version 2.139; Borgatti, 2002); for Figures 1 through 16, ORA (Version 2.3.6; Carley, 2011); and for Figure 17, Pajek (Version 3.08; Mrvar & Batagelj, 2012). The network metrics in Tables 2 was calculated using a fourth SNA software program, Ucinet 6 (Version 6.512; Borgatti & Freeman, 2002). The references for these four software programs are as follows:

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Borgatti, S. P. & Freeman, L. C. (2002). Ucinet 6 for Windows, version 6.512 [computer software]. Harvard, MA: Analytic Technologies.

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