



# Summary of Aggrieved Populations Country Reports

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## Inequality, Risk Sensitivity, and Grievance in Context

Deeper Analyses  
Clarifying Insights  
Better Decisions

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## Executive Summary

Success in the global competition between the US, China, and Russia may be determined by a country's ability to influence the world's populations. A population's aspirations and grievances can drive national security problems for all three powers when frustrated aspirations and grievances lead to state instability, terrorism, or other challenges such as unwanted or unmanaged migration. In accordance with the questions posed in the J39 Strategic Multilayer Assessment (SMA) Great Power Competition tasking, this report summarizes context-specific qualitative and quantitative analyses of the conditions impacting population aspirations and grievances for 25 countries, and how these impact US, Chinese, and Russian interests. Issues include:

- Identifying where aggrieved populations are likely to exist globally and how they may be operationalized against US interests
- Anticipating the effects of global climate change on state stability
- Identifying the forms of instability that may challenge US interests (political instability, autocratic regimes, violent extremism, adversarial proxies)
- Identifying the causes and effects of mass migration
- Understanding Chinese interests and strategies in specific countries and their impacts on US interests
- Understanding Russian interests and strategies in specific countries and their impacts on US interests

Six broad patterns in inequality, risk sensitivity, and social disruption emerged from these analyses.

- **Baselines.** Two countries were used to baseline all other comparisons.
  - **Finland**—The world's most stable society is also one of the world's most egalitarian and therefore least acceptant of risk. The population also is homogenous, lacks a history of feudal inequality, and has a high level of education. The Finnish population's lack of risk acceptance and high level of education appear to have inoculated its population against Russian attempts at disruption through social media.
  - The **United States**—The US was chosen as a baseline because of its familiarity to the researchers and intended audience of this report. The US has a **highly risk acceptant** population increasingly divided along class, race, and rural/urban divides. Furthermore, much of the middle class is experiencing **loss aversion** due to losses suffered in the Great Recession of 2009, which have not been regained. Adversaries have effectively used this risk acceptance to sow discord through social media.
- **Risk Acceptant Populations**—Brazil, Honduras, Mexico, Nigeria, South Africa, and Venezuela have populations that are entirely or mostly risk acceptant.

- The primary effect of widespread risk acceptance is extremely high **homicide** rates, confirming research that demonstrates a connection between inequality and homicide.
- In Nigeria and Venezuela, inequality between ethnic groups and/or classes has given rise to extremely disruptive protests, rebellions, and terrorism. Social unrest in **Nigeria** threatens oil production, investments, and the political stability of Africa's most populous country, which all great powers desire. Social unrest in **Venezuela** threatens Russian and Chinese investments in propping up an adversarial government to the US.
- **Honduran** and **Mexican** inequality and risk acceptance has fueled **illegal migration** and created disruption at the US border and further division among the US population.
- Widespread risk acceptance in **China** has caused little disruption because of the state's ability to suppress dissent, and to sustain growth that provides opportunities for a population hungry for advancement. However, protests in **Hong Kong** and **Xinjiang** are symptoms that when wealthy Chinese feel threatened (Hong Kong) or minorities (Uighurs in Xinjiang) perceive unfair gains for Han Chinese, the state will be challenged. A key to China's mitigation of the risk acceptance of its population is to sustain a high rate of growth, which the Chinese economy may not be able to do in the future.
- **Loss Averse Populations**—A number of the countries in the sample are experiencing real or perceived economic losses, leading to loss aversion, risk taking, and unrest.
  - **European countries** in this sample (**Croatia, France, Germany, Italy, Serbia, United Kingdom**) largely experienced either real or perceived losses and threats to their livelihoods and cultures from immigration, placing their populations into highly risk acceptant, loss averse, frames. This has manifest in **challenges to their political status quo** (Brexit) and the rise of right-wing challenges to their governments. **Russia** has exploited the situation to weaken European governments, the integrity of the European Union, and NATO.
  - Dramatic losses in status by working class **Pakistanis** fueled the rise of maverick populist Prime Minister Imran Khan.
  - Real and sustained economic losses in the **Venezuelan** economy have contributed to unrest.
  - Losses from a softening oil market and US sanctions are exacerbating upper-class risk acceptance and rural/urban differences, although the **Iranian** government's ability to suppress dissent will probably contain any serious challenge to the government.
- **Agrarian Populations**—Agrarian societies are characterized by extreme levels of inequality and consequently, risk acceptance. This was especially the case in **Afghanistan, Ethiopia, Honduras, India, Indonesia, Nigeria, and Pakistan**. Most of these countries are also distinguished by sharp ethnic divides in access to wealth and opportunity, and all of them have a distinct impoverished rural vs. relatively wealthy urban divide. These divisions and inequalities create highly risk acceptant populations with grievances against other ethnic groups and urban elites, fueling social unrest in many forms including ethnic conflict, rebellion against the government, and terrorism.
- **Typical Populations**—A typical society has an impoverished, risk acceptant class of poor, a distinct and risk averse middle class, and a highly risk acceptant elite. **India, Indonesia, Japan, Russia, Serbia, and South Korea** have such a typical profile.
  - In the cases of **Japan** and **South Korea**, low inequality in relation to other countries has supported social stability, although there has been a shift toward a more nationalistic government in Japan.

- **India** and **Indonesia** have so far been able to mitigate degrees of risk acceptance in some segments of their populations through continued economic growth. However, their agrarian and rural/urban divides and their ethnic diversity pose a challenge to stability.
- **Russia's** and **Serbia's** communist past has left a legacy of relative equality compared to most countries, despite the rapid growth of their economies since the fall of the Soviet Union and a continued concentration of wealth among oligarchs. For now, indications are that Russians and Serbs are not risk acceptant enough to pose a serious challenge to their governments.
- **North Korea**—There is probably no more unequal country than the Democratic People's Republic of Korea (DPRK). Virtually all wealth is concentrated in an extremely small cadre at the very top of society. Furthermore, the Kim regime punishes all dissent extremely harshly and effectively. This provides common North Koreans, who are struggling to survive, with virtually no incentive to rebel or to take any risky course of action such as escape through immigration. They are predicted to be risk averse. In contrast, the fight for the spoils among the elite is expected to generate intense competition and challenges at the top. There is some evidence that challenges have occurred. However, the Kim family has so far punished any challenge, even from close relatives, extremely harshly, effectively quashing any dissent. The DPRK is a truly unique case.

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# Purpose

This study addresses several key questions posed in the J39 tasking memo for the 2019 Strategic Multilayer Assessment (SMA) Great Power Competition project (see Appendix A for a mapping of these questions to the findings of this study). These questions generally concern trends in the influence environment (US Joint Chiefs of Staff, 2018), how they impact US, Chinese, and Russian interests, and how these powers are likely to act in these environments.

Specific issues assessed in this study range from:

- Understanding nationalist and populist trends.
- Identifying where aggrieved populations are likely to exist globally and how they may be operationalized.
- Anticipating the effects of global climate change on state stability.
- Identifying the forms of instability that may challenge US interests (instability, autocracy, violent extremism, adversarial proxies).
- Identifying the causes and effects of mass migration.
- Understanding Chinese interests and strategies in specific countries and their impacts on US interests.
- Understanding Russian interests and strategies in specific countries and their impacts on US interests.

# Approach

The US, Russia, and China compete in a global environment composed of the world's populations. The grievances of these populations and the instability of their societies have become tools used to undermine US interests (US Joint Chiefs of Staff, 2018). As Jones (2019) notes, populations are the new queens of the global competition chessboard; they collectively hold great power and in order to compete we must understand them. This report summarizes detailed analyses of stability and grievance in 25 countries that impact US, Russian, and Chinese interests.

This report is complementary to the *Aggrieved Populations: Statistical Modeling of Risk and Political Instability in the Influence Environment* report, which presented statistical models of political instability, terrorism, and migration based on global data from 173 countries. That report provided a global statistical picture, but by definition could not capture the full social and political context relevant to specific cases. In an effort to provide a richer contextual understanding of global trends in challenges to US interests, these 25 countries were chosen for more in depth analysis (Table 1). The countries were chosen because of their importance to US, Russian, or Chinese interests and to ensure that all continents were captured.<sup>1</sup>

There is a separate, stand-alone, report for each country that covers:

- US, Chinese, and Russian primary national interests.
- A literature review on inequality in that country.

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<sup>1</sup> Due to time limitations, Australia and Antarctica were omitted.

- Analysis of multiple data sets on inequality to provide risk sensitivity assessments of its population.
- The implications of the above for US, Chinese, and Russian interests.

Table 1. Countries Chosen for In-Depth Analysis

Region	Countries
North America	United States
Latin America	Brazil, Honduras, Mexico, Venezuela
Europe	Croatia, Finland, France, Germany, Italy, Serbia, United Kingdom
Africa	Ethiopia, Nigeria, South Africa
Southern Asia	Afghanistan, India, Iran
East Asia	China, Indonesia, Japan, North Korea, South Korea

What follows is a summary of the patterns between inequality, risk sensitivity, and social unrest, and their impacts on great power interests. The reader interested in a full account of a particular country is encouraged to read its fully referenced Country Report. Links to these reports are found in Appendix B.

## Methodology

The empirical analyses upon which this report's findings are based utilize a method of measuring the risk sensitivity in a country's population. See Appendix C for a full exposition of the underlying theory, methodology, and literature review. A brief description is offered here. Wealth signals social status, therefore providing a function by which social status can be measured across a society. A typical society has a low tail representing people with low wealth and status, an abrupt increase in wealth that defines a typically broad "middle class," and an extremely abrupt increase defining the wealthy elite (Figure 1).

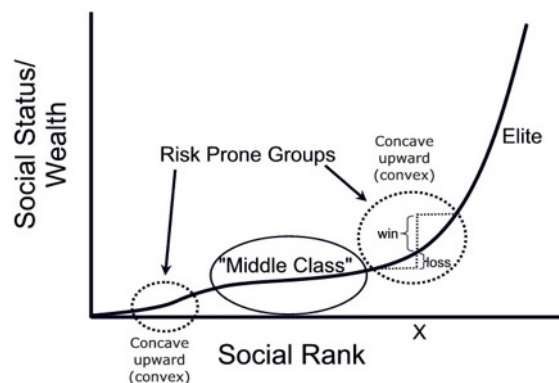


Figure 1. Typical Wealth Distribution

Rational choice theory predicts that those in concave upward segments of the curve would be motivated to take risks because their gains exceed their losses (Friedman & Savage, 1948). This proposition has received substantial confirmation across societies and cultures (Pryor, 1976). Additionally, behavioral economists have noted that people feel much more regret at a loss than happiness at an equivalent gain and are willing to take risks to avoid a loss (loss aversion) (Tversky & Kahneman, 1981). Arrow (1974) and

Pratt (1964) operationalized the measurement of risk sensitivity from utility functions in a metric known as the Arrow-Pratt measure of risk aversion; positive values indicate risk aversion and negative values risk acceptance. Friedman and Savage's propositions and those from behavioral economics can be combined with the Arrow-Pratt measure to predict risk taking behavior, and this has been applied broadly in different cultures and to predict modern forms of social unrest (by definition risky) such as violent protest and terrorism (Kuznar, 2002, 2007; Kuznar, 2019b, 2019c).

## Findings

Knowing the level of inequality and risk sensitivity of a single country provides limited insights because it is difficult to identify meaningful patterns from what may be normal. Comparative analysis is a powerful means for identifying normal from meaningful patterns in a society (Goodrick, 2014). Two countries were chosen to provide a baseline for comparison. Finland was chosen because it is considered the world's most stable country; presumably Finland's level of inequality and risk sensitivity influences its stability (Henley, 2018; O'Connell, 2004; Yusuf & Nabeshima, 2012). The other baseline country is the United States, which was chosen simply because the researchers and the likely readers of this report are personally familiar with American levels of inequality and political conditions.

During the course of the study, several patterns emerged when comparing the results from individual countries, and these patterns structure the rest of this discussion (Table 2). Some countries had populations that were entirely or almost entirely risk acceptant. Some countries had populations, or segments of their populations, that were experiencing or perceiving wealth and status loss, and were likely especially influenced by loss aversion. Seven of the 24 countries had large agrarian populations and stark rural/urban divides. Six exhibited typical patterns of inequality among the world's countries, with well-defined poor, middle class, and wealthy sectors. Finally, North Korea's level of inequality exhibits an unusual pattern in which virtually all wealth is concentrated among only the very elite, leaving the vast majority of its population destitute. For this reason, North Korea will be treated as a special case.

*Table 2. Risk Sensitivity Patterns of Countries in this Study*

<b>Risk Sensitivity Pattern</b>	<b>Countries</b>
Baselines	Finland, United States
Entirely Risk Acceptant Populations	Brazil, China, Croatia, Honduras, Mexico, Nigeria, South Africa
Loss Averse Societies	Croatia, France, Germany, Iran, Italy, Pakistan, Serbia, UK, Venezuela
Agrarian	Afghanistan, Ethiopia, Honduras, India, Indonesia, Nigeria, Pakistan
Typical Risk Sensitivity Pattern	India, Indonesia, Japan, Russia (but intense for wealthy), Serbia, South Korea
Special Case: North Korea	North Korea

## Baselines: Finland and The United States

Comparative case study analysis involves systematic comparison of variables across a number of specific examples and is a particularly powerful means for revealing underlying causal mechanisms that drive social, political, and demographic trends (George & Bennett, 2005; Goodrick, 2014). In order to maximize the utility of comparative analysis, it is useful to have well-understood baseline cases to which other examples can be compared. Two baselines were chosen for this study. Finland was chosen because of its designation as the world's most stable country.<sup>2</sup> The focus of this study is instability but knowing the conditions for stability is vitally important in order to be able to judge what counter-conditions might underly instability.<sup>3</sup> Therefore, beginning a study of instability with an iconic example of stability guards against circular reasoning and broadens the scope of the findings. The second baseline example, the United States, was chosen because this is an example with which the researchers and the intended audience are likely to already be familiar.

### *Finland: Paragon of Stability*

Finland has been assessed as the world's most stable society by a variety of organizations and measures and is also considered one of the world's most egalitarian societies in terms of wealth, education, and social services (Henley, 2018; O'Connell, 2004; Plantenga, Remery, Figueiredo, & Smith, 2009). If a case can be made that equality supports stability, Finland could be its posterchild. There are several reasons why researchers think that Finland's lack of inequality underwrites its social stability. Some of these are due to Finland's unique heritage. Henley (2018) argues that Finns promote a culture of self-reliance and cooperation derived from the necessities of surviving in a harsh and cold land. Also, serfdom never existed in Finland and so the medieval roots of European inequality are absent, and the spread of Lutheranism throughout Finland required every adult to read the Bible, making education compulsory and valued since the 1600s (Henley, 2018; Leijola, 2004; O'Connell, 2004). Finns supposedly have been on the vanguard of modern egalitarian trends as well. Finland led female emancipation globally, tapping into this half of societies' creative potential, and its transparent government has invested in long term planned economic development and social policy that was supported by an ethnically homogenous population (Henley, 2018; Yusuf & Nabeshima, 2012). In terms of the metrics that characterize Finland's inequality and stability, it is the most stable country in the world and has one of the lower Gini coefficients (a measure of inequality) of any country in the world, corroborating the relationships identified here. In summary, Finland's political and social stability appears to be a function of ethnic homogeneity, a history of equality in wealth and education, attention to women's equality, and publicly supported planning.

Finland's stability is an asset for the US and China. Finland is not a formal US ally, but it often plays a mediating role between Russia and other European countries; it therefore is a stabilizing force in the region. China aspires to exploit arctic trade routes with Finland and stability enhances China's investment (Conley, 2019; Havnes & Seland, 2019). Russia has a more problematic relationship with Finland and has sought to sow discord through social media campaigns and funding Finnish nationalist groups hostile to the government (Boddy & Shattuck, 2018; Szymanski, 2018). However, Finland's stability, public support

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<sup>2</sup> See <http://fundforpeace.org/tag/finland/> for an assessment of Finnish stability.

<sup>3</sup> This refers to the issue of "selecting on the dependent variable," which refers to analyzing only the condition of interest and using that analysis for the basis of one's findings. This can lead to circular reasoning because alternative explanations that might lead to other conditions are not considered.

for its government, and high level of education have served to inoculate the population against Russian meddling (Szymanski, 2018).

### *The United States: Divisiveness at Home*

The US is one of the world's wealthiest countries per capita but is also one of the world's most unequal. This creates an overwhelmingly exponential wealth distribution curve, rendering nearly the entire population risk acceptant. The poor and the wealthy register extremely high risk acceptant measures. Furthermore, the middle class was most affected by the Great Recession of 2009 because their wealth was invested in their homes and most losses were in housing (Wolff, 2016). Wolff (2016) notes that the wealthy have garnered 95% of the wealth from the post-recession recovery and data from this study demonstrate a net loss of wealth for Americans in the 20<sup>th</sup> to 80<sup>th</sup> percentiles, and a strong net gain for the top 10%. Therefore, the wide swath of middle-income America is expected to be loss averse. Recent American politics have been especially divisive and contentious and has seen unexpected shifts in the electorate, culminating in the election of a President who few expected had a chance of winning and whose platform spoke directly to the sense of loss many working class Americans and others felt (Campbell, 2018). In addition, the Occupy Wall Street movement was a direct reaction to the sense of loss and unfairness of middle and lower socioeconomic classes. The pattern of inequality in the US indicates that Americans would be either highly risk acceptant and/or loss averse; this appears to be manifest in the volatility of current American politics and the fact that the electorate took a chance on a candidate far outside the political mainstream but who promised a major change in the status quo.

Russia and China benefit from American inequality and divisiveness and have been involved in well-known attempts to sow discord through cyberattacks and social media campaigns designed to sow discord (Coats, 2019; Directorate of National Intelligence, 2017; US Department of Homeland Security and Federal Bureau of Investigation, 2016; Watts, 2017).

### **Risk Acceptant Populations: Brazil, China, Croatia, Honduras, Mexico, Nigeria, South Africa**

Seven countries had populations that were either entirely or nearly entirely risk acceptant. Five of these countries, Brazil, Honduras, Mexico, Nigeria, and South Africa, have particularly high homicide rates, ranking 11<sup>th</sup>, 2<sup>nd</sup>, 17<sup>th</sup>, 40<sup>th</sup>, and 9<sup>th</sup> respectively. This is interesting because there is a well-known but poorly understood relationship between homicide and inequality (Daly, 2016). This was born out in these specific country studies. This study found that risk sensitivity was actually the best predictor of homicide in a country, the correlation between risk aversion and homicide was -0.450 and extremely highly statistically significant. Homicide is a driver of emigration (Kuznar, 2019c) and two of the countries, Mexico and Honduras, are major sources of illegal migration to the US while Nigeria is a major source of migrants to Europe (Cohn, Passel, & Gonzalez-Barrera, 2017; Cummings, Pacitto, Lauro, & Foresti, 2015). Migrants from Honduras cite homicide as one of the most important reasons for their seeking asylum (Medecins sans Frontieres, 2017). Inequality and high levels of risk acceptance therefore contribute to the security risk of illegal immigration to the US and its European allies.

The risk acceptance of Nigeria's population is compounded by competition between ethnic and religious groups and a deep rural/urban cultural and economic divide. Most of Nigeria's wealth is concentrated in the urban southwest among mostly Christian Yoruba and Igbo ethnic groups. In contrast, poverty is

rampant among the Muslim Hausa and Fulani of the arid northeast. Inequality is used by politicians from the northeast to mobilize their supporters, although they often use their position to aggrandize themselves, creating another tier of inequality within these ethnic groups (Asiedu, 2006; Bouchat, 2013; Ebegbulem, 2012; Fagbadebo, 2007; International Monetary Fund, 2019; Ogundiya, 2010). Stark inequalities have also fueled raids between ethnic groups in the northeast, especially between Fulani herdsmen and agricultural communities (Ajayi, 2014), and fueled rebellion and kidnap-for-ransom in the oil producing south (Bragg, Brickman, Desjardins, Pagano, & Popp, 2015; Lobban & Dalton, 2017). Finally, the rise of the jihadist Boko Haram in northeast Nigeria is in part attributed to the region's poverty (Lobban & Dalton, 2017; Thurston, 2018).

High levels of risk acceptance in Brazil and Mexico may drive segments of its population toward risky illicit activities such as trafficking and the drug trade, and for wealthier individuals, various forms of corruption.

The instability that accompanies Brazil, Honduras, Mexico, Nigeria, and South Africa threatens US interests. Ethnic strife and terrorism in Nigeria destabilize the region and potentially the flow of oil to the world market. High homicide rates create a dangerous and uninviting business environment, and in the case of Mexico and Honduras, drives illegal migration to the US. China has recently made humanitarian and educational investments in central America, therefore instability there can threaten these interests.

Inequality and risk acceptance are manifest differently in China and Croatia than in the high crime countries just described. China's history of being largely agrarian combined with its rapid economic growth has concentrated wealth in urban zones, exacerbating the rural/urban divide and leading to a basically exponential wealth distribution curve, rendering the entire population risk acceptant. Because of the Chinese government's ability and willingness to suppress dissent, China experiences little political disruption. Therefore, risk acceptance tends to be channeled in government sanctioned ways that promote stability. China's rapidly growing economy presents risk acceptant, entrepreneurial Chinese with opportunities to take socially accepted risks in business and mostly reap profits. However, emergent inequalities have created some notable frictions; the Uighur crisis and Hong Kong riots present two contrasting examples. The Uighur crisis is rooted in rapid development in Xinjiang province that primarily benefitted immigrant Han Chinese, leading to indigenous Uighur resentment.<sup>4</sup> Initial Uighur unrest was met with counter-riots from ethnic Han and ultimately to a government crack-down and the incarceration of a million Uighurs in re-education camps.<sup>5</sup> The current protests in Hong Kong are ostensibly about Chinese extradition laws and perceived increasing mainland Chinese political control of the Island. However, Hong Kong has flourished recently and is recognized as one of Asia's four Tiger economies along with South Korea, Taiwan, and Singapore. Hong Kong's rapid growth was possible because of the "One China, Two Systems" agreement of 1997 that afforded Hong Kong its own constitution and a great deal of autonomy from the Chinese government. Perceived interference from mainland China threatens the prosperity and standard of living of Hong Kongers, whose per capita GDP is five times greater than mainland China's. The residents of Hong Kong represent the wealthy segment of China predicted to be highly risk acceptant.

The wealth distribution curve fit to Croatia was one of the few that was fairly poor, and therefore there is low confidence in the findings. The curve fit produced one of the most risk acceptant populations, despite the existence of a middle class "hump" in the wealth distribution data. However, the overall pattern

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<sup>4</sup> See <https://www.bbc.com/news/world-asia-china-26414014> for an assessment of Uighur resentment.

<sup>5</sup> See <https://www.cfr.org/backgrounder/chinas-crackdown-uighurs-xinjiang> for reports of Uighur incarceration.

appears typical, with the poor and the wealthy representing as the most risk acceptant. Since the fragmentation of Yugoslavia, Croatia has been ethnically and religiously homogenous, leaving an increasing income gap between the wealthy and the poor as the primary cleavage in Croatian society. Since Croatia is a member of the EU and NATO, potential instability works in the favor of Russia and against US interests.

## Loss Aversion: Croatia, France, Germany, Iran, Italy, Pakistan, Serbia, UK, Venezuela

Nine of the 25 countries had evidence of perceived or real economic loss and therefore one would expect loss aversion to be a factor in the population's risk taking. Iran, Pakistan, and Venezuela were cases where there was very evident real loss of income that impacted all or part of the society. Iran has experienced a drop in per capita GDP due to sanctions. Earlier studies of Iran's oil economy indicate that inequality increases during oil recessions, which the country is now clearly experiencing due to sanctions (Dizaji, 2016; Farzanegan & Alaedini, 2016; Khlebnikov, 2019; Nademi, 2018). Recent protests among businessmen and elites are challenging the government over the effects of sanctions, consistent with this study's predictions (Kuznar, 2019a). Elite Iranians, to include those in charge of government, are likewise motivated to be risk acceptant, possibly leading to their recent attacks on shipping and Saudi oil fields. Venezuela has experienced a social breakdown due to a mismanaged government and economy and US sanctions. The only Venezuelans not impacted have been political allies of Nicolas Maduro (who has remained in power despite having been defeated in elections) and elites in the state-controlled oil industry. The result has been widespread riots, spiking crime rates, and scarcity. Pakistan surprisingly was not very risk acceptant as a population, however, between the years 2014 and 2018, skilled craftsmen and related professions experienced a dramatic decrease in income and social status. These have been among the maverick new Prime Minister Imran Khan's most ardent supporters. His party's platform is based on championing the working class against the entrenched elite Pakistani political establishment (Kuznar & Aviles, 2018). Their loss of status may have motivated them to support new, albeit untested, leadership.

The remaining countries (Croatia, France, Germany, Italy, Serbia, UK) are European and enjoy relatively high standards of living compared to most of the world's population. However, in each case, threat to employment cultural integrity have been used by politicians and Russian-backed information operations to stoke fears of a loss in status that has led to the emergence of nationalism, a weakening of democratic institutions, and the break-up of a unified Europe. Croatia is experiencing a real loss in wealth. Serbia is a gateway for illegal immigration of refugees from the Middle East, and France, Germany, and Italy are other key recipients of African and Middle Eastern refugees (Cummings et al., 2015). Finally, fears of Islamic terrorism combined with the loss of working class jobs to Eastern European immigrants motivated many Brits to vote for an exit from the European Union (Forte & Portes, 2017). The political manifestations of this loss aversion include the rise of nationalistic parties such as National Rally (France), Alternative for Germany, and the Five Star Movement (Italy), Serbian and Croatian nationalism, and Brexit.

The rise of nationalist parties in these countries in response to real or perceived losses undermines democratic institutions and alliances such as the EU and NATO, thereby threatening US interests. Russia, in contrast, is benefitting from these trends. China's primary benefit is the curtailment of US power, although China is also investing in these countries as part of its BRI (Belt and Road Initiative), the success of which depends on a healthy European economy. The unrest in Venezuela is threatening President

Maduro's power, and by extension threatening an important political foothold for both Russia and China in Latin America.

## Agrarian Societies: Afghanistan, Ethiopia, Honduras, India, Indonesia, Nigeria, Pakistan

Agrarian societies tend toward extremes in wealth concentration because of the unpredictable ups and downs of climate and markets that tends to concentrate land ownership and therefore wealth in the hands of a very few (Kuznar, 1991, 1995, 2001; Smith et al., 2010; Wilk, 1983). For this reason, countries with large peasant agricultural and nomadic herding sectors tend toward inequality and risk acceptance. A common misconception is that peasant societies are egalitarian, but the empirical reality is that they are among the most unequal societies that have ever existed and are highly competitive; interpersonal violence over resources and rebellions are very common in these societies (Dahl, 1979; Dyson-Hudson & Dyson-Hudson, 1980; Fleisher, 2000; Kuznar, 2003; Lewis, 1951; Schneider, 1979; Simons, 1995; Suliman, 1998; Walker, 1999), and their homicide rates tend to be extremely high (Bolton, 1973; Keiser, 1991; Knauft, 1987; Kuznar, 1995; Palmstierna, Frangou, Walette, & Dunbar, 2017; Pinker, 2011). Because globalization tends to bring wealth to urban areas, an additional dimension of inequality develops between urban and rural zones in countries with large agricultural sectors. Each of these countries is currently experiencing varied levels of social unrest, spanning from the Afghan extreme of rural Ghilzai Pashtun involvement in the opium trade and support for the Taliban (Cornell, 2005; Nett & Ruttinger, 2016), to Nigerian Fulani raids on agricultural communities and support for Boko Haram (see above), to the rise of Pakistani and nationalistic parties (Kuznar & Aviles, 2018; Kuznar & Yager, 2012; Kuznar, Yager, Clair, & Stephenson, 2012), and Honduran, Pakistani, and Nigerian mass emigration (see above).

The US generally benefits from stability and economic modernization. The extreme inequality typical of agrarian societies works against stability, and peasant agriculture is the antithesis of production at economies of scale amenable to trade. Therefore, the economic development of countries such as these has been a key goal of USAID since its inception in 1961.<sup>6</sup> For Russia and China, instability in agrarian countries can be a benefit to the extent that it curtails US influence. However, key routes in China's BRI must pass through many of these countries, and therefore in the long-run, instability and inequality are problematic for China.

## Typical Patterns of Inequality and Risk Sensitivity: India, Indonesia, Japan, Russia, Serbia, South Korea

Since the development of permanent wealth for signaling social status differences, approximately 10,000 years ago (Brown, 1985; Harris, 1998), the typical pattern is that a society has a tail of impoverished people at its bottom, which jumps to a broad "middle class," which then jumps to an elite that controls most of a society's wealth (Kuznar, 2002; Scheidel, 2017). This results in a pattern of risk sensitivity in which the poor and the elite are risk acceptant, with the wealthy being the most acceptant of risk, and a broad, "middle class" that is risk averse and seeks to avoid risks, financial and political. Six of the specific countries studied in detail as part of this project exhibit this pattern. Several, India, Indonesia, and Serbia, have already been described. Russia, Japan, and South Korea will be elaborated upon here.

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<sup>6</sup> See <https://www.usaid.gov/what-we-do/economic-growth-and-trade> for development objectives.

Japan and South Korea are among the world's most egalitarian countries. Consequently, they have comparatively little serious political challenge to their governments, although Japan has recently seen a political shift toward increased nationalism. Russia, given its wealth-levelling communist history, exhibits a low level of inequality and therefore low risk acceptance overall. However, post-Soviet economic development, especially in primary commodities such as energy, created an elite class of oligarchs who control these industries, placing them in an extremely risk acceptant frame. Notably, President Vladimir Putin has exerted much control over the primary Russian energy company, Gazprom, in order to control the oligarch's aspirations and to advance his own. Therefore, Russia exhibits relatively low levels of risk acceptance throughout its society, leading to a preference for the status quo Putin that Putin represents to many. This is a source of stability for the Russian government. However, elites in Russia are predicted to be particularly risk acceptant and competitive, including President Putin.

The typical pattern of inequality and risk sensitivity is potentially problematic in times of crisis when influential risk acceptant elites mobilize risk acceptant poor to challenge the status quo (Besancon, 2005; Brinton, 1964; Egnal & Ernst, 1972; Foran, 2005; Gurr, 1970; Kuznar, 2002, 2007). Crises usually arise from some loss or frustrated aspiration (Davies, 1962). In today's world these are most likely brought about through economic losses and external threats such as migration. When stability is in the US interest, such as India, Indonesia, Japan, and South Korea, avoiding crises through trade, economic development, and the control of migration should enhance stability. In the case of US adversaries, such as Russia and its ally Serbia, crises that lead to instability could check their power. In the case of US allies, instability aids China in curtailing US power but as China extends its economic investments globally, instability will become problematic because it will threaten Chinese investments and international trade along the BRI.

### Special Case: North Korea

North Korea is in a class of its own. It is among the world's poorest countries and probably has the most totalitarian regime under Kim Jong-un. Much of the population appears to be destitute and near starvation. The Songbun caste system determines every individual's access to resources and education, but analyses of satellite photos reveal that energy usage indicates that only the most elite in government (centered in Pyongyang) and in key industries (in Pyongyang and elsewhere) share in this wealth (Lee, 2018). The North Korean government is probably also the most brutal in its suppression of any dissent. This creates a social status system in which almost the entire country is basically equal in its poverty and people have no motivation to compete with one another. However, extreme concentration of wealth among the very elite produces intense competition over the country's spoils at that level. Kim Jong-un and his family have dealt extremely harshly with dissent throughout society, including at the top. This creates a situation in which the vast majority of the population is risk averse and only trying to survive, along with potentially volatile power struggles at the top. So far Kim Jong-un and his close circle, including his sister, have been able to reign in dissent through extreme measures that include the execution of his uncle, Jang Song-thaek, and the assassination of his brother, Kim Jong-nam. Therefore, despite North Korea's apparently extreme inequality, the totalitarian control of the regime creates an extremely stable state. As Apolte (2012) has noted for North Korea and societies in general, inequality alone is not enough to support revolution. The primary danger to Kim Jong-un's regime is a power play from elites in the state apparatus; so far suspected challenges have been swiftly eliminated. It appears that all great powers benefit from stability in North Korea. A stable North Korea avoids costly war or humanitarian crises and preserves trade and investments that the US and China especially have in the region (Astorino-Courtois & Bragg, 2018).

## Summary

The aim of this study was to provide a deeper analysis of inequality data, sensitive to the context of specific countries, and to relate the implications of these findings to US, Russian, and Chinese interests and Great Power Competition.

Six broad patterns in inequality, risk sensitivity, and social disruption emerged from these analyses. Two countries were used to baseline all other comparisons. Finland was chosen because it is considered the most stable country in the world. According to theories of inequality, Finland's stability should be underwritten by low inequality that translates to low risk acceptance in the population. In fact, this is exactly what the data reflected, validating the theoretical underpinnings of this study. In addition, Finland has an ethnically homogenous population, lacks a medieval history of serfdom, and has one of the world's most highly educated populations. These factors appear to have helped Finnish society to deflect Russian attempts to sow discord through misinformation campaigns in social media. The US was chosen as a baseline because of its familiarity to the researchers and intended audience of this report. The US has a highly risk acceptant population increasingly divided along class, race and rural/urban divides. Furthermore, much of the middle class is experiencing loss aversion due to losses suffered in the Great Recession of 2009, which have not been regained. Adversaries have effectively used this risk acceptance to sow discord through social media.

Six countries (Brazil, Honduras, Mexico, Nigeria, South Africa, and Venezuela) had populations in which nearly everyone or everyone was predicted to be risk acceptant, due to extreme inequality. Previous research established a clear, if poorly understood, association between inequality and homicide (Daly, 2016), and this study reinforced this pattern. In fact, the risk sensitivity metric used in this study correlates much more highly with homicide and all of these countries have very high homicide rates. Ethnic divisions accompanied by wealth differences exacerbate the high level of risk acceptance in countries like Nigeria leading to rebellion and terrorism. Social unrest in Nigeria threatens oil production, investments, and the political stability of Africa's most populous country, which all great powers desire. Social unrest in Venezuela threatens Russian and Chinese investments in propping up an adversarial government to the US. Honduran and Mexican inequality and risk acceptance has fueled illegal migration and created disruption at the US border and further division among the US population. Widespread risk acceptance in China has caused little disruption because of the state's ability to suppress dissent, and to sustain growth that provides opportunities for a population hungry for advancement. However, protests in Hong Kong and Xinjiang are symptoms that when wealthy Chinese feel threatened (Hong Kong) or minorities (Uighurs in Xinjiang) perceive unfair gains for Han Chinese, the state will be challenged. A key to China's mitigation of the risk acceptance of its population is to sustain a high rate of growth, which the Chinese economy may not be able to do in the future.

Some countries in the sample are experiencing real or perceived economic losses, leading to loss aversion, risk taking, and unrest. European countries in this sample (Croatia, France, Germany, Italy, Serbia, United Kingdom) largely experienced either real or perceived losses and threats to their livelihoods and cultures from immigration, placing their populations into highly risk acceptant, loss averse, frames. This has manifest in challenges to their political status quo (Brexit) and the rise of right-wing challenges to their governments. Russia has exploited the situation to weaken European governments, the integrity of the European Union, and NATO. Dramatic losses in status by working class Pakistanis fueled the rise of maverick populist Prime Minister Imran Khan. Real and sustained economic losses in the Venezuelan economy have contributed to unrest. Losses from a softening oil market and US sanctions are

exacerbating upper-class risk acceptance and rural/urban differences, although the Iranian government's ability to suppress dissent will probably contain any serious challenge to the government.

Agrarian societies are characterized by extreme levels of inequality and consequently, risk acceptance. This was especially the case in Afghanistan, Ethiopia, Honduras, India, Indonesia, Nigeria, and Pakistan. Most of these countries are also distinguished by sharp ethnic divides in access to wealth and opportunity, and all of them have a distinct impoverished rural vs. relatively wealthy urban divide. These divisions and inequalities create highly risk acceptant populations with grievances against other ethnic groups and urban elites, fueling social unrest in many forms including ethnic conflict, rebellion against the government, and terrorism.

A typical society has an impoverished, risk acceptant class of poor, a distinct and risk averse middle class, and a highly risk acceptant elite. India, Indonesia, Japan, Russia, Serbia, and South Korea exhibit such a typical profile. In the cases of Japan and South Korea, low inequality in relation to other countries has supported social stability, although there has been a shift toward a more nationalistic government in Japan. India and Indonesia have so far been able to mitigate degrees of risk acceptance in some segments of their populations through continued economic growth. However, their agrarian and rural/urban divides and their ethnic diversity pose a challenge to stability. Russia's and Serbia's communist past has left a legacy of relative equality compared to most countries, despite the rapid growth of their economies since the fall of the Soviet Union and a continued concentration of wealth among oligarchs. For now, indications are that Russians and Serbs are not risk acceptant enough to pose a serious challenge to their governments.

There is probably no more unequal country than the DPRK. Virtually all wealth is concentrated in an extremely small cadre at the very top of society. Furthermore, the Kim regime punishes all dissent extremely harshly and effectively. This provides common North Koreans, who are struggling to survive, with virtually no incentive to rebel or to take any risky course of action such as escape through immigration. They are predicted to be risk averse. In contrast, the fight for the spoils among the elite is expected to generate intense competition and challenges at the top. There is some evidence that challenges have occurred. However, the Kim family has so far punished any challenge, even from close relatives, extremely harshly, effectively quashing any dissent. The DPRK is a truly unique case.

## Appendix A: Alignment of Aggrieved Populations Country Reports Study with J39 GCC Tasking

Part	Required Capability	Topic
Part I: Anticipating the Operating Environment 2019-2029	Concept element 1: understand the environment (required capability 2)	nationalist counters to globalism amidst the resurgence of traditional values and processes; populist politics reshaping economic relationships and social bonds
		operationalization of aggrieved populations
		global environmental change
		emergent risks such as mass migration of peaceful economic migrants?
Part II: Deep Dive: China's Global Outlook, Activities and Strategy	Concept element 1: understand the environment (required capability 1, 5)	What key sources of motivation / interests drive Chinese global activities and strategy? What are the fundamental issues contested? How do these impact enduring US national interests?
Part III: Deep Dive: Russia's Global Outlook, Activities and Strategy	Concept element 1: understand the environment (required capability 1, 5)	What key sources of motivation / interests drive Russian global activities and strategy? What are the fundamental issues contested? How do these impact enduring US national interests?
Part IV: Regional Challenges	Concept element 1: understand the environment (required capability 1, 5)	In which regions should the US expect significant challenges to its interests over the coming decade?
		What form will these challenges take (e.g., poor/instable governance, rising hegemony, aggrieved populations, violent non-state actors, external influence operations etc.)
		which US interests will this impact?
		How will allied and neutral nations be impacted by: US, Chinese and Russian influence?

## Excerpts from J39 Tasking Memo and J39 Questions

Relevant passages are underlined.

J39 Memo, Brigadier General Alexis G. Grynkewich

3. To that end, the SMA effort needs to address the geopolitics of Russian and Chinese activities while building an enhanced fundamental understanding of the contemporary and future influence environment. Directed to Tab A questions.

### Part I: Anticipating the Operating Environment 2019-2029

Concept element 1: understand the environment (required capability 2)

How will global geopolitics be affected over the coming decade by factors such as: the intersection of social media, Fake News and AI challenging democratic governance; nationalist counters to globalism amidst the resurgence of traditional values and processes; populist politics reshaping economic relationships and social bonds; the dual use of new technologies to undermine and strengthen domestic political regimes?

How will the character of global competition and conflict change over the next decade? What are the new forms of conflict, such as cyber, economic and cognitive? How will technology change the character of competition? What is the nature of influence and its role in the emerging security environment? Key drivers of change may include:

- opportunities and vulnerabilities created by technology developments
- changing means of obtaining and producing material to assemble improvised explosive device (IED)
- increased speed and range of communication and information transfer
- expanded competition in space and cyber domains
- operationalization of aggrieved populations
- emerging challenges to liberal trade practices
- global environmental change
- “lawfare” undermining legitimacy of international institutions
- Decline in public conception of truth as an objective fact in deference to subjective individual “truths”

What considerations should inform DoD/DHS plans and practices to deal with emergent risks such as mass migration of peaceful economic migrants?

### Part II: Deep Dive: China’s Global Outlook, Activities and Strategy

Concept element 1: understand the environment (required capability 1, 5)

*Demonstrates a systematic analytic approach for diagnosing and describing the environment, and evaluating the interests resolve, and capability of relevant actors*

What key sources of motivation / interests drive Chinese global activities and strategy? What are the fundamental issues contested? How do these impact enduring US national interests?

### Part III: Deep Dive: Russia’s Global Outlook, Activities and Strategy

Concept element 1: understand the environment (required capability 1, 5)

*Demonstrates a systematic analytic approach for diagnosing and describing the environment, and evaluating the interests resolve, and capability of relevant actors*

What key sources of motivation / interests drive Russian global activities and strategy? What are the fundamental issues contested? How do these impact enduring US national interests?

#### Part IV: Regional Challenges

Concept element 1: understand the environment (required capability 1, 5)

*Demonstrates a systematic analytic approach for diagnosing and describing the environment, and evaluating the interests resolve, and capability of relevant actors*

In which regions should the US expect significant challenges to its interests over the coming decade?

What form will these challenges take (e.g., poor/instable governance, rising hegemons, aggrieved populations, violent non-state actors, external influence operations etc.) and which US interests will this impact?

How will allied and neutral nations be impacted by:

- Chinese influence
- US maneuvers to protect its interests against Chinese actions?
- Russian influence
- US maneuvers to protect its interests against Russian actions?

## Appendix B: List of Specific Country Reports and URLs

1. Afghanistan Aggrieved Populations Country Report: <https://nsiteam.com/afghanistan-inequality-report-an-nsi-aggrieved-populations-analysis/>
2. Brazil Aggrieved Populations Country Report: <https://nsiteam.com/brazil-country-report-an-nsi-aggrieved-populations-analysis/>
3. China Aggrieved Populations Country Report: <https://nsiteam.com/china-country-report-an-nsi-aggrieved-populations-analysis/>
4. Croatia Aggrieved Populations Country Report: <https://nsiteam.com/croatia-country-report-an-nsi-aggrieved-populations-analysis/>
5. DPRK Aggrieved Populations Country Report: <https://nsiteam.com/dprk-country-report-an-nsi-aggrieved-populations-analysis/>
6. Ethiopia Aggrieved Populations Country Report: <https://nsiteam.com/ethiopia-country-report-an-nsi-aggrieved-populations-analysis/>
7. Finland Aggrieved Populations Country Report: <https://nsiteam.com/finland-country-report-an-nsi-aggrieved-populations-analysis/>
8. France Aggrieved Populations Country Report: <https://nsiteam.com/france-country-report-an-nsi-aggrieved-populations-analysis/>
9. Germany Aggrieved Populations Country Report: <https://nsiteam.com/germany-country-report-an-nsi-aggrieved-populations-analysis/>
10. Honduras Aggrieved Populations Country Report: <https://nsiteam.com/honduras-country-report-an-nsi-aggrieved-populations-analysis/>
11. India Aggrieved Populations Country Report: <https://nsiteam.com/india-country-report-an-nsi-aggrieved-populations-analysis/>
12. Indonesia Aggrieved Populations Country Report: <https://nsiteam.com/indonesia-country-report-an-nsi-aggrieved-populations-analysis/>
13. Iran Aggrieved Populations Country Report: <https://nsiteam.com/iran-country-report-an-nsi-aggrieved-populations-analysis/>
14. Italy Aggrieved Populations Country Report: <https://nsiteam.com/italy-country-report-an-nsi-aggrieved-populations-analysis/>
15. Japan Aggrieved Populations Country Report: <https://nsiteam.com/japan-country-report-an-nsi-aggrieved-populations-analysis/>
16. Mexico Aggrieved Populations Country Report: <https://nsiteam.com/mexico-country-report-an-nsi-aggrieved-populations-analysis/>
17. Nigeria Aggrieved Populations Country Report: <https://nsiteam.com/nigeria-country-report-an-nsi-aggrieved-populations-analysis/>
18. Pakistan Aggrieved Populations Country Report: <https://nsiteam.com/pakistan-country-report-an-nsi-aggrieved-populations-analysis/>
19. Russia Aggrieved Populations Country Report: <https://nsiteam.com/russia-country-report-an-nsi-aggrieved-populations-analysis/>
20. Serbia Aggrieved Populations Country Report: <https://nsiteam.com/serbia-country-report-an-nsi-aggrieved-populations-analysis/>
21. South Africa Aggrieved Populations Country Report: <https://nsiteam.com/south-africa-country-report-an-nsi-aggrieved-populations-analysis/>
22. South Korea Aggrieved Populations Country Report: <https://nsiteam.com/south-korea-country-report-an-nsi-aggrieved-populations-analysis/>

23. United Kingdom Aggrieved Populations Country Report: <https://nsiteam.com/united-kingdom-country-report-an-nsi-aggrieved-populations-analysis/>
24. United States Aggrieved Populations Country Report: <https://nsiteam.com/united-states-country-report-an-nsi-aggrieved-populations-analysis/>
25. Venezuela Aggrieved Populations Country Report: <https://nsiteam.com/venezuela-country-report-an-nsi-aggrieved-populations-analysis/>

## Appendix C: Measuring Inequality and Risk Sensitivity

### Inequality

Inequality can be measured many ways including percentage of wealth owned by the top x percent, percent of a population living in poverty, or the commonly used Gini Coefficient.<sup>7</sup> Each of these measures provides insight into how wealth is distributed in a society, but each obscures subtle and sometimes significant variations. In order to display more of this variation, the wealth of each percentile of society is measured in this study. Displaying wealth in this manner reveals any abrupt increases or levelling of wealth as one moves from the poorest to the wealthiest percentiles in a society. Wealth classes are defined by relatively flat sections of the curve that occur between abrupt increases in wealth. Figure 2 represents a wealth distribution curve typical of most societies, which have a tail of very poor, followed by a sharp increase in wealth that is fairly level and defines a middle class, which is then followed by an extremely sharp increase that continues all the way to the wealthiest individuals in a society. Mathematically, this curve is monotonically increasing, with an initially concave upward section (the poor), followed by a concave downward segment (the middle class), followed by a strongly concave upward section (the wealthy). The curve reflects the fact that wealth is typically concentrated at the top.

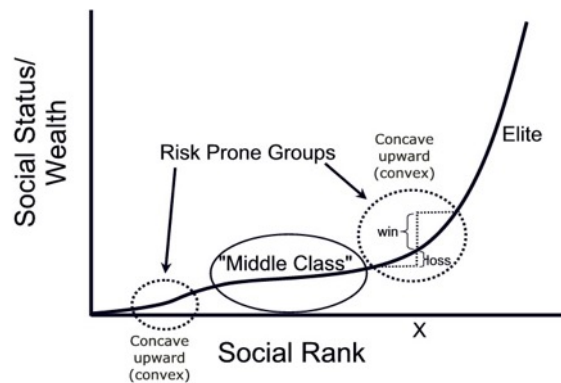


Figure 2. Typical Wealth Distribution Curve

Research demonstrates that this pattern is found in societies as varied as small tribes to ancient kingdoms, modern states and even the entire world economy (Kuznar, 2001, 2002). Given the length of time these societies are known to have existed, the implication is that extreme inequality has probably been a pervasive feature of human societies for the past 10,000 years.

### Wealth and Status

The practical utility of wealth is obvious, it can be used to purchase goods and services people need or desire. However, wealth plays another social role that is often neglected in economic studies, it signals social status. The simplest societies use tokens, often made from exotic materials that have little or no practical use whatsoever. A few examples include metal arm bands in ancient Germanic societies, the

<sup>7</sup> The Gini Coefficient is the difference between the Lorenz curve, defined by percent wealth of each percentile of a society, and the line of total equality, in which each percentile of society shares equally in society's wealth.

shell arm bands and necklaces of the Trobriand Islanders in the south Pacific, and sheets of elaborately carved copper of indigenous tribes along the North American northwest coast (Malinowski, 1985; Mauss, 1967; Rosman & Rubel, 1986). Modern societies are no different. The conspicuous consumption (Veblen, 1994) of the wealthy is abundantly present in modern society; they build elaborate mansions and buy luxury cars whose cost far exceeds what is necessary to satisfy the basic needs of shelter and transportation. The wealthy are not the only people interested in tokens of status. A study of social media discussions among the US general public found a positive correlation between inequality and desire for status goods (Walasek & Brown, 2015). Wealth has much greater significance than purchasing power, it signals one's position in society and consequently one's social worth.

## Inequality, Wealth and Status, and Risk Sensitivity

Wealth has great material and social value, and therefore one would expect people to compete for it. However, not everyone is equally motivated to compete. People whose utility functions (measures of satisfaction) are concave downward are expected to avoid risk and purchase insurance, which they do (Bernoulli, 1954; Cashdan, 1985). By its very nature, competition is risky because there is the possibility of failure and loss of status. One would expect people to accept risks to achieve status when potential gains exceed potential losses, or when the probability of success far exceeds the probability of failure (Friedman & Savage, 1948; Markowitz, 1952). This pattern of risk taking behavior has been confirmed across an incredibly wide array of cultures around the world including hunting and gathering bands, tribes, kingdoms and modern states (Kuznar, 2001, 2002; Pryor, 1976). Such situations are represented by concave upward sections of the wealth distribution curve in Figure 2. Risk taking to gain status can take many forms. Legal and socially accepted forms of risk taking include investing in the stock market or starting a business. However, people may engage in unsanctioned or illicit forms of risk taking as well. Criminal forms of risk taking include dealing in illicit drugs, burglary, or illegal migration. Engaging in unsanctioned protest, rioting, or political violence are by definition extremely risky. Therefore, only those who perceive the gains (in wealth, status, political goals) from such activity to be far greater than losses from failure are expected to engage in political challenges to a society's status quo. However, even risk averse preferences can be flipped to risk taking.

Loss aversion is another pervasive pattern in human risk taking behavior. Gains give people satisfaction, and losses cause them disappointment. However, the amount of disappointment people feel from a loss is typically twice the satisfaction they feel from an equivalent gain (Kahneman & Tversky, 2000). The asymmetry between satisfaction and disappointment causes people to pay high costs or take risks in order to avoid losses; they are loss averse. Loss aversion is obviously manifest in the fact that people generally over-insure (Camerer, 2000; Wang & Fischbeck, 2004). Loss aversion can be influenced by the frame, or manner, in which someone views a prospect, and frames can be easily manipulated. A classic study carried out on well-educated medical students found that they would adopt a treatment if they were told it saved 2/3 of their patients but rejected the treatment if they were told it could result in the deaths of 1/3 of their patients (Tversky & Kahneman, 1981). The two prospects are the same, the only thing that differs is the language used to frame the prospect to the medical students. In short, loss aversion can flip risk aversion to strong risk acceptance. Therefore, when assessing the risk sensitivity of any population, it is important to ascertain whether it is focused on the hope of gains or the fear of loss.

Theories of risk sensitivity and loss aversion have been applied widely in international relations and social unrest research. While not explicitly and mathematically expressed, the idea of resentment from perceived inequality is at the core of relative deprivation theory (Gurr, 1970) which has been widely

applied for explaining revolutions (Besancon, 2005; Gurr & Moore, 1997; Henderson & Singer, 2000; Muller, Dietz, & Finkel, 1991; Tilly, 1978; Weede & Muller, 1998), terrorism (Crenshaw, 1981; O'Neill, 2000; Thompson, 1989), and social protest movements (Midlarsky, 1988). Collier & Hoeffler's (2004) greed and grievance approach to explaining social unrest and rebellion captures elements of both risk sensitivity and loss aversion. Loss aversion has been explicitly applied in explanations for the Gulf War, Korean War, and World War I (Boettcher, 2004; Jervis, 1992; Levy, 2000, 2003; McDermott, 2000), the decision to use the military in humanitarian operations (Boettcher, 2004), and terrorism (Kuznar, 2007; Kuznar & Lutz, 2007).

## Measuring Risk Sensitivity

Concepts can be useful tools for guiding how we think, but they become scientifically useful when they are operationalized so that they can be measured and their effects on other measurable phenomena can be tested. John W. Pratt (1964) provided a measure of risk sensitivity for an individual at different levels of wealth.<sup>8</sup> Subsequent work by Kenneth Arrow (1974) reinforced this notion and it is known as the Arrow-Pratt measure of risk aversion. The measure is calculated as:

*Equation 1. Arrow-Pratt Measure of Risk Aversion*

$$r(x) = -\left(\frac{U(x)''}{U(x)'}\right)$$

Where  $U(x)$  is a utility function that measures satisfaction for differing levels of wealth,  $x$ .

The measure can range from  $-\infty$  to  $+\infty$ , and negative values indicate the degree of risk acceptance and positive values indicate the degree of risk aversion. To the extent that wealth is a measure of social status, the distribution of wealth therefore becomes the function of its utility, which was implied in the original proposition for measuring utility by Friedman and Savage (1948). Therefore, by fitting a curve to a wealth distribution one can measure wealth's utility for conveying social status, and the Arrow-Pratt measure can be applied to determine the risk sensitivity of an individual at any level of wealth. Fitting a curve to the typical wealth distribution of a complex society can be challenging, but Kuznar (2007) published a means by which such a distribution can be measured with a continuous function to which the Arrow-Pratt measure can then be applied. The measure is called the exposigmoid function because typical wealth distributions are generally exponential (wealth concentrates at the top), but exhibit sinusoid (S-shaped) oscillations that define wealth classes (Figure 2). The function is estimated as:

*Equation 2. Expo-sigmoid utility function*

$$S(rank) = e^{a+b(rank)+c\sin(rank)+d\cos(rank)}$$

Where  $S$  is the exposigmoid fit to the wealth distribution, and  $rank$  is the rank from poorest to wealthiest in the society. The fit is achieved by logging wealth ( $x$ ) over  $rank$  and then fitting a curve to  $a + b(rank) + c*\sin(rank)+d*\cos(rank)$ . This produces a monotonically increasing, twice differentiable function to which the Arrow-Pratt measure can be applied, yielding a measure of an individual's risk sensitivity at every level of wealth in a society.

<sup>8</sup> His formulation is based on the assumption that an individual's utility function (measure of satisfaction over differing levels of wealth) is twice differentiable, that is, it is monotonically increasing (increasing wealth does not decrease satisfaction) and non-linear.

This approach utilizes powerful theoretical insights from rational choice theory in economics on risk sensitivity, combined with the Friedman and Savage (1948) insight that differing levels of wealth in social classes powerfully influence utility functions. This measure correlates with political challenges to the status quo (violent and non-violent) to the status quo (Kuznar, 2002, 2007; Kuznar, 2019b, 2019c; Kuznar & Lutz, 2007).

The pervasiveness of loss aversion demands that it, too, be taken into account in any estimation of risk sensitivity. The basic proposition of loss aversion is that a person averse to risk when considering gains is acceptant of risk when considering losses (Tversky & Kahneman, 1981). Therefore, in every country study, attention is paid to whether segments of a society are experiencing measurable losses (recession, job losses) or perceived losses (influence by political messaging). In those cases, it is expected that segments of a society in concave downward areas of a wealth distribution curve would flip their sensitivity from risk aversion to risk acceptance.

## Summary

Social status is the key good people seek and wealth is a key signal of one's social status. Wealth distributions therefore provide a utility function that can measure willingness to take or avoid risk. Wealth distributions provide monotonically increasing twice differentiable functions to which the Arrow-Pratt measure can be applied. The measure identifies risk acceptant segments of a society more likely to challenge the status quo through political action, with the caveat that if a population experiences real or perceived loss, their risk averse preferences will flip to risk acceptance two-fold. These basic propositions, empirically supported by a history of research, will guide the interpretation of the empirical analyses of inequality and risk sensitivity in the individual country studies.

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