

Protests and the Arab Spring: An Empirical Investigation

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Abstract

This article discusses a variety of major explanations for the intensity of recent protests in Arab states and investigates whether there is empirical support for them. We survey various political, economic, and social factors and develop a comprehensive empirical model to estimate the structural determinants of protests in 19 Arab League states between 1990 and 2011, measured using events data. The results show that protests were stronger in countries with higher inflation, higher levels of corruption, lower levels of freedom, and more use of the internet and cell phones. Protests were also more frequent in countries with partial democracies and factional politics. We find no evidence for the common argument that the surge in protests in 2011 was linked to a bulge in the youth population. Overall, we conclude that these economic, political, and social variables help to explain which countries had stronger protest movements, but that they cannot explain the timing of those revolts. We suggest that a contagion model can help explain the quick spread of protests across the region in 2011, and we conduct a preliminary test of that possibility.

I. Introduction

The Arab revolts started in Tunisia in December 2010 and spread across the Middle East and North Africa with great speed in early 2011.¹ In Tunisia and Egypt, loosely organized groups using mostly nonviolent techniques managed to topple regimes that had been in power for decades. The protests became more violent when they spread to other countries such as Yemen, Bahrain, Libya, and Syria. By the end of 2011, sporadic protests had spread to other Middle Eastern countries, including Algeria, Jordan, Kuwait, Morocco, Palestine, and Saudi Arabia. These uprisings, which have become known as the Arab Spring, took most experts by surprise. Studies of the Middle East prior to 2011 typically emphasized the longevity of authoritarianism in the region and explained it in terms of state security, state control of the economy, and the adaptability of the authoritarian model.²

This article reviews the main explanations for the intensity of protests in Arab states and investigates whether there is empirical support for these explanations. Since the onset of the Arab Spring, experts have offered various explanations related to different grievances believed to have driven the revolts. We survey these explanations and develop several empirical models to estimate the structural determinants of protests in 19 Arab League countries.³ If these factors produced grievances that formed the environment in which these protests occurred, we should be

¹ For simplicity, we will refer to this region as the Middle East throughout the article.

² Eva Bellin, "The Robustness of Authoritarianism in the Middle East: Exceptionalism in Comparative Perspective," *Comparative Politics* 36 (2004): 139-157; Jason Brownlee, *Authoritarianism in the Age of Democratization* (New York: Cambridge University Press, 2007); Gregory F. Gause, "Why Middle East Studies Missed the Arab Spring: The Myth of Authoritarian Stability," *Foreign Affairs* 90 (July/August 2011): 81-90; and Marsha Poussey, "Authoritarianism: Middle East Lessons for Comparative Theory," *Comparative Politics* 36 (2004): 127-138.

³ We should note that this article evaluates the grievances believed to be related to the protests and does not attempt to explain the outcomes of such protests—a significant topic, which is better explored elsewhere.

able to observe a correlation between some of these measures and protests. However, we recognize that grievances alone are not sufficient to explain the emergence of protests. In addition to variables measuring economic and political grievances, we account for state capacity and the role of social media and other social factors. We develop three different models based on political, economic, and social factors. In some of our estimates of the models, we include country **fixed effects** to control for unobserved country characteristics that are constant over time and that affect the level of protests.

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The article makes several important contributions to existing knowledge of the Arab Spring. First, we examine the Arab Spring using an events data set as a way of measuring the extent of the revolts. The events data provide a more nuanced measure of the Arab Spring protests than dichotomous indicators measuring the presence or absence of protests. We quantify the strength of the Arab Spring movement in a country by counting the number of [events classified as protests, demands, and calls for political reform](#) ~~reports~~ in online news [reports](#) ~~sources of protests, demands, and other calls for political reform~~. The dependent variable we examine is the average daily number of protests and demands for political reform in a country in a given year. Second, using this dataset, we test some of the more significant hypotheses in the literature about the Arab Spring. We find that protests in the Arab League nations were stronger in countries with higher inflation, higher levels of corruption, less freedom, and a greater increase in the use of the **Internet** and cell phones. The protests were also larger in countries that had governments characterized as partial democracies with factionalism, which is defined by Goldstone et al. as sharp polarization between uncompromising voting blocs.⁴ Third,

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⁴ Jack Goldstone, et al., "A Global Model for Forecasting Political Instability," *American Journal of Political Science* 54 (2010): 190-208.

our statistical results do not support the argument that a demographic youth bulge was a major factor in the protests. In fact, if anything, we find that the youth bulge is associated with *fewer*, not more, protests. We extend our analysis to test if this counter-intuitive finding depends on other conditions (e.g., education or unemployment) as a cause of protests, but we find no robust evidence that this is the case. Moreover, we find that although the economic, political, and social variables linked to the Arab Spring can help predict which countries faced more protests, they cannot explain the timing of the protests. We suggest that the spread of protests in 2011 should be explored as a diffusion effect, in which protests in one country inspired protests in neighboring countries. We explore this possibility at the end of the article. In the next two sections, we discuss the various explanations associated with the onset of the Arab Spring and describe the data we use and the different statistical models we test. Then we discuss results of the different model specifications and conclude by summarizing our main findings and suggesting areas for further research.

Explaining the Arab Spring

Were the Arab revolts spontaneous, as some observers have painted them, or were they linked to political, economic, and social grievances?⁵ Certainly, many Middle Eastern countries experienced demonstrations and protests in the past, but not at the mass scale or persistent level observed in 2011. In a number of previous cases, regimes had tried to manage protests by

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⁵ Katerina Delacoura, "The 2011 Uprisings in the Arab Middle East: Political Change and Geopolitical Implications," *International Affairs* 88 (2012): 63-79.

making cosmetic changes to the political and economic order. The early 1990s were the high point for such efforts, but they failed to address genuine grievances of the opposition.⁶

Most explanations for the intensity of the protests during the Arab Spring are related to political, economic, and social grievances.⁷ Studies have linked the Arab revolts to such variables as the youth bulge, high unemployment, high food prices, cuts in subsidies, lack of economic growth, lack of freedom, corruption, and growth of social media.⁸ A good example of the effects of these factors is the case of Tunisia. Schraeder and Redissi cite several socioeconomic, political, and military indicators such as high unemployment rates, a relatively young population, rising food costs, lack of democracy, and endemic corruption as responsible for the fall of the Zine al-Abidine Ben Ali regime.⁹ However, writing during the early months of

⁶ Lisa Anderson, "Searching Where the Light Shines: Studying Democratization in the Middle East," *Annual Review of Political Science* 9 (2006): 189-214, at 194.

⁷ Tony Badran, "Syria's Assad No Longer in Vogue: What Everyone Got Wrong about Bashar al-Assad" in *The New Arab Revolt*, ed. Council on Foreign Relations (New York: Council on Foreign Relations, 2011), 210-214; Melani Cammett, Ishac Diwan, Alan Richards, and John Waterbury, *A Political Economy of the Middle East*, (Boulder, CO: Westview Press, 2015), 1-34; Filipe Campante and Davin Chor, "Why was the Arab World Poised for Revolution? Schooling, Economic Opportunities, and the Arab Spring," *The Journal of Economic Perspectives* 26 (2012): 167-87; Gregory F. Gause, "Why Middle East Studies Missed the Arab Spring," 81-90; Michael Hudson, "The Middle East in Flux," *Current History* 110 (2011): 364-369; Randall Kuhn, "On the Role of Human Development in the Arab Spring," *Population and Development Review* 38 (2012): 649-683; Ann Lesch, "Egypt's Spring: Causes of the Revolution," *Middle East Policy* 18 (2011): 35-48; Lin Noueihed and Alex Warren, *The Battle for the Arab Spring* (New Haven, CT: Yale University Press, 2012), 24-43; Kamal Eldin Osman Salih, "The Roots and Causes of the 2011 Arab Uprisings," *Arab Studies Quarterly* 35 (March 2013): 184-206; and Onn Winckler, "The Arab Spring: Socioeconomic Aspects," *Middle East Policy* 20 (2013): 68-87.

⁸ Unsurprisingly, the focus of Arab Spring explanation is similar to other models, which use some of the same internal characteristics of states to explain the onset of civil conflict (for example, see Havård Hegre, Joakim Karlsen, Havård Nygård, Havård Strand, and Henrik Urdal, "Predicting Armed Conflict, 2010-2050," *International Studies Journal* 57 (2013): 250-270; and Barry Hughes, Devin Joshi, Jonathan Moyer, Timothy Sisk, and José Solórzano, *Strengthening Governance Globally: Forecasting the Next 50 Years* (Boulder, CO: Paradigm Publishers, 2014), 72-99.

⁹ Peter Schraeder and Hamadi Redissi, "Ben Ali's Fall," *Journal of Democracy* 22 (2011): 5-19.

the Arab Spring, Anderson cautioned against making sweeping generalizations about the causes of the revolts, noting that countries in the Middle East faced different challenges.¹⁰ Differences among the structural factors for each country are likely to influence the character and outcome of the revolts.

In this section, we examine the explanations given for the Arab revolts under the broad categories of economic, political, and social factors. For each category, we provide a brief sketch of the importance of these explanations, particularly for the six countries that have become most associated with the Arab Spring because of their persistent and widespread protests (Bahrain, Egypt, Libya, Syria, Tunisia, and Yemen), although the later statistical analysis includes most Arab League states. Similar themes tend to be present under each category for many of the countries, as reflected by the demands of the protesters.

Economic Factors

Economic conditions across the Middle East vary across rich and poor countries, with the former generally having oil-based economies. Industrialization in the 1960s and the oil boom of the 1970s led to state-controlled economic growth in most states, and development paths for most countries in the region at some point included import substitution industrialization policies. These policies were practiced primarily by single party states or by regimes with populist platforms, which provided subsidies and welfare benefits that in essence formed social contracts between the governments and the people.¹¹

¹⁰ Lisa Anderson, “Demystifying the Arab Spring: Parsing the Differences between Tunisia, Egypt, and Libya,” *Foreign Affairs* 90 (May/June 2011): 2-7.

¹¹ Melani Cammett, “The Political Economy of Developments in the Middle East” in *The Middle East*, ed. Ellen Lust (Washington, D.C.: CQ Press, 2011): 99-142.

Since the 1970s, non-oil states, especially Egypt, Jordan, Morocco, and Tunisia, have been opening up their economies by privatizing some industries, inviting in foreign capital, and decreasing the benefits of the state welfare system. Over time, this has had a negative impact on economic conditions.¹² Kaboub attributes the causes of the Arab Spring to the negative consequences of the neoliberal economic model that many countries adopted in the 1980s.¹³ The structural reforms encouraged by outside lenders, such as the International Monetary Fund, created some economic growth but also concentrated wealth and widened the gap between the rich and the poor. However, Cammett and Diwan point out that protesters were influenced more by the perception of inequality resulting from liberal economic policies than by inequality itself, and they conclude that “inequality based on standard consumption-based measures does not appear to be a driver of the uprisings.”¹⁴

More importantly, structural adjustment policies resulted in decreased government spending or cuts in the welfare state. Structural adjustment policies also led to an increase in unemployment, particularly for the young working population.¹⁵ The practice of many authoritarian regimes of providing food subsidies to ensure stability was also eroded by liberal economic policies, and as a result, prices for staple items increased.¹⁶ In Egypt, food prices rose 19% and bread prices rose 37% in 2008, leading some to conclude that food prices were crucial

¹² Gause, “Why Middle East Studies Missed the Arab Spring,” 81-90.

¹³ Fadhel Kaboub, “The End of Liberalism? An Institutional Analysis of the Arab Uprisings,” *Journal of Economic Issues* 47 (2013): 533-543.

¹⁴ Melani Cammett and Ishac Diwan, *The Political Economy of the Arab Uprisings* (Boulder, CO: Westview Press, 2013), 21.

¹⁵ Winckler, “The Arab Spring,” 68-87; and Campante and Chor, “Why was the Arab World Poised for Revolution?,” 167-87.

¹⁶ Annia Ciezadlo, “Let Them Eat Bread: How Food Subsidies Prevent (and Provoke) Revolutions in the Middle East,” in *The New Arab Revolt*, ed. Council on Foreign Relations (New York: Council on Foreign Relations, 2011), 229-235.

to Arab Spring.¹⁷ However, others disagree with this view. Cincotta argues that high food prices were unlikely to be the cause of the Arab Spring. He notes that in Tunisia the local consumer food price index was relatively low and did not change over the relevant time period. Moreover, the Tunisian government's announcement in early January 2011 that it was going to lower basic food prices had no effect on the protests.¹⁸

Some of the more significant economic grievances included unemployment, particularly for the younger cohorts, and lack of economic growth. According to Knickmeyer, the region has the highest unemployment for youths in the world, and this fact has been cited by many scholars, journalists, and policy makers as a key determinant of the Arab Spring events.¹⁹ Understanding the link between economic development and political stability provides a useful foundation for explaining the Arab revolts.²⁰ In the 1950s, Lipset established a link between economic development and democracy.²¹ More recently, Przeworski and Limongi established a threshold of \$6,000 per capita (in 1995 dollars), after which countries become politically more stable.²²

Economic explanations receive some support from case studies. Tunisia is a good example of a mixed economy that has progressed far enough to be classified as a state with a

¹⁷ Rami Zurayk, "Use Your Loaf: Why Food Prices Were Crucial in the Arab Spring" *The Guardian*, July 17, 2011.

¹⁸ Richard Cincotta, "High Food Prices an Unlikely Cause for the Start of the Arab Spring," *New Security Beat*, April 7, 2014.

¹⁹ Ellen Knickmeyer, "The Arab World's Youth Army," *Foreign Policy* (January 27, 2011), available at <https://foreignpolicy.com/2011/01/27/the-arab-worlds-youth-army-2/>.

²⁰ Omar Dahi, "Understanding the Political Economy of the Arab Revolts," *Middle East and Information Project* 259 (2011): 2-6.

²¹ Seymour Martin Lipset, "Social Requisites for Democracy: Economic Development and Political Legitimacy," *American Political Science Review* 33 (1959): 69-105.

²² Adam Przeworski and Fernando Limongi, "Modernization: Theories and Facts," *World Politics* 49 (1997): 155-183.

medium level of development, based on its GDP per capita.²³ The major problems facing Tunisia in 2011 were the underemployment of the young, corruption, and high inflation. In Tunisia, the regions that revolted were the center and south, areas that were underdeveloped.²⁴ Trade unions, particularly at the local level, proved to be the key to the protests' success in Tunisia.

By most economic measures, Yemen has a low level of development and is poorly integrated into the world economy. Unemployment is high, and the oil industry accounted for 20% of its GDP in 2010.²⁵ Grievances of the Yemeni protesters were connected to lack of jobs and poor living conditions.²⁶

For Bahrain, the main proposed economic cause of the revolts is the high unemployment rate of the young. Campante and Chor, for instance, show that Bahrain was among the top 10 countries in the world in terms of increases in schooling attainment from 1980-2010, and they argue that the combination of increased education levels and poor employment prospects played an important role in the start of the Arab Spring there.²⁷

Singerman links the revolts, particularly in Egypt, to the high youth unemployment and greater inequality produced by the neoliberal economic model that Egypt adopted for the last several decades.²⁸ Egypt's experimentation with liberal economic policies dates back to its

²³ Jeffrey Coupe, "Tunisia," in *The Middle East*, ed. Ellen Lust (Washington, D.C.: CQ Press, 2011), 702-729.

²⁴ Farhad Khosrokhavar, *The New Arab Revolutions that Shook the World* (Boulder, CO: Paradigm, 2012).

²⁵ Sara Phillips, "Yemen," in *The Middle East*, ed. Ellen Lust. (Washington, D.C. : CQ Press, 2011), 761-778.

²⁶ Khaled Fattah, "Yemen: A Social Intifada in a Republic of Sheikhs," *Middle East Policy* 18 (2011): 79-85, at 81.

²⁷ Campante and Chor, "Why was the Arab World Poised for Revolution?" 167-87.

²⁸ Diane Singerman, "Youth, Gender, and Dignity in the Egyptian Uprising," *Journal of Middle East Women's Studies* 9 (2013): 1-27.

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policy of “opening” (*infitah*) under the Sadat regime in the 1970s.²⁹ As Egypt borrowed more money from lending institutions, such as the International Monetary Fund and World Bank, it was pressured to engage in structural reforms throughout the 1980s and 1990s.³⁰ The regime’s economic policies created a narrow base of support centered in the business community. More recently, the regime’s policies also gave the military an entrenched role in the economy by giving it control in various sectors, including military production, tourism, and agriculture.³¹ Economic reforms since the 1990s enriched the few at the expense of the many, leading to the growth of crony capitalism, which granted monopoly rights to close friends and relatives of the regime.³² Structural reform policies ultimately weakened the welfare state in Egypt, leading to high unemployment, low paying jobs, and alienation of the middle class. The economic crisis of 2008 and rising food prices—partly due to global climate change—added more pressure on Egypt, which depends on food imports.³³ For example, bread prices tripled in Egypt in 2011 due to the doubling of wheat prices on the global market.³⁴ Forty-one percent of its population lived

²⁹ John Waterbury, *The Egypt of Nasser and Sadat* (NJ: Princeton University Press, 1983), 123-157, at 123.

³⁰ Tarek Masoud, “Egypt,” in *The Middle East*, ed. Ellen Lust (Washington, D.C.: CQ Press, 2011), 387-410.

³¹ Zoltan Barany, “Comparing the Arab Revolts: The Role of the Military,” *Journal of Democracy* 22 (2011): 24-35, at 28.

³² Cammett and Diwan, *The Political Economy of the Arab Uprisings*, 16.

³³ Sarah Johnstone and Jeffrey Mazo, “Global Warming and the Arab Spring,” *Survival* 53 (2011): 11-17.

³⁴ Troy Sternberg, “Chinese Drought, Bread, and the Arab Spring,” *Applied Geography* 34 (2012): 519-24.

under the national poverty line during 2000-06.³⁵ In the end, structural reforms failed to meet the expectations of many groups, especially the middle class.³⁶

During the last two decades, Syria also experimented with economic liberalization. Hinnebusch argues that economic liberalization under Bashar al-Assad after 2000 “required a restructuring of the regime’s social base away from its initial populist alliance,” which led to growth in the private sector and contributed to the revolts.³⁷ At the time of the revolts, Syria faced a high unemployment rate (estimated at 20%) and declining oil revenues, which were a small but significant part of the economy. The country also suffered from a high poverty rate, with 30% living under the national poverty line from 2000 to 2006.³⁸ The 2007-09 drought in Syria further exacerbated the economic and social pressures in the country, leading to higher food prices and an influx of peasants into the cities.³⁹

It is interesting to note that the Arab revolts affected non-oil states much more than oil states. Some have argued that the persistence of authoritarianism in the Arab world is related to

³⁵ United Nations Development Programme, *Arab Human Development Report, 2009: Challenges to Human Security in the Arab Countries* (New York: United Nations Development Programme, Regional Bureau for Arab States, 2009).

³⁶ Hazem Kandil, “Why Did the Egyptian Middle Class March to Tahrir Square?” *Mediterranean Politics* 17 (2012): 197-215, at 210-211.

³⁷ Raymond Hinnebusch, “Syria: From Authoritarian Upgrading to Revolution?” *International Affairs* 88 (2012): 95-113, at 106.

³⁸ Raymond Hinnebusch, “Syria,” in *The Middle East*, ed. Ellen Lust (Washington, D.C. : CQ Press, 2011), 675-701, at 690; and United Nations Development Programme, *Arab Human Development Report 2009*.

³⁹ Myriam Ababsa, “The End of the World: Drought and Agrarian Transformation in Northeast Syria (2007-2010),” in *Syria from Reform to Revolt: Volume 1: Political Economy and International Relations*, ed. Raymond Hinnebusch and Tina Zintl (NY: Syracuse University Press, 2015): 199-222; and Suzanne Saleeby, “Sowing the Seeds of Dissent: Economic Grievances and the Syrian Social Contract’s Unraveling,” *Jadaliyya* (February 16, 2012), available online at <http://www.jadaliyya.com/pages/index/4383/sowing-the-seeds-of-dissent-economic-grievances-an>.

oil, in what is referred to as the oil curse, or the rentier state model.⁴⁰ For example, Ross argues that oil wealth can help some rulers to contain protests by allowing them to buy off citizens through the distribution of benefits.⁴¹ Bueno de Mesquita and Smith also link the longevity of dictators to economic resources they can use to put down rebellions.⁴² The same link is explored by Brownlee, Masoud, and Reynolds in an attempt to explain the causes and outcomes of the Arab Spring revolts.⁴³ However, Libya's oil wealth did not ~~prevent the eruption of protests in the country~~ shield the country from protests. In 2008, Libya was producing 1.8 million barrels per day and was estimated to have 43 billion barrels in reserves.⁴⁴ Libya's GDP per capita averaged \$14,400 in 2005, putting it over the threshold for countries susceptible to internal revolts. However, unemployment remained high during the last decade, ranging from 18% to 20% between 2000 and 2010.⁴⁵ Despite the country's economic growth, most of the wealth remained in the hands of the powerful.

The discussion of economic factors above leads us to test hypotheses regarding economic variables in the following model in the statistical section of this article:

⁴⁰ Ibrahim El Badawi and Samir Makdisi, "Explaining the Democracy Deficit in the Arab World," *Quarterly Review of Economics and Finance* 46 (2007): 813-831; and Giacomo Luciani, "Resources, Revenues, and Authoritarianism in the Arab World: Beyond the Rentier State?" in *Political Liberalization and Democratization in the Arab World: Theoretical Perspectives*, ed. Rex Brynen, Bahgat Korany, and Paul Noble (Boulder, CO: Lynne Rienner, 1995): 211-228.

⁴¹ Michael Ross, "Will Oil Drown the Arab Spring?" *Foreign Affairs* 90 (September/October, 2011): 2-7.

⁴² Bruce Bueno de Mesquita and Alastair Smith, *The Dictator's Handbook* (New York: PublicAffairs, 2011).

⁴³ Jason Brownlee, Tarek Masoud, and Andrew Reynolds, *The Arab Spring* (New York: Oxford University Press, 2015), 18-39.

⁴⁴ Luis Martinez, "Libya," in *The Middle East*, ed. Ellen Lust. (Washington, D.C. : CQ Press, 2011), 551-575.

⁴⁵ World Bank data, accessed at <https://data.worldbank.org/indicator/SL.UEM.TOTL.ZS>.

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Economic Model: An increase in the level of protests is correlated with low levels of GDP per capita and GDP per capita growth, high inflation rates, high youth unemployment rates, and greater trade openness.⁴⁶

Political Factors

Another set of explanations for the onset of the Arab revolts focuses on the various political grievances people held against their governments. The first Arab Human Development Report in 2002 identified lack of freedom as a major impediment to development in the Middle East and found that the region had the lowest scores of all world regions for voice and accountability.⁴⁷ Relatedly, according to 2010 Freedom House rankings, this region had the highest number of states defined as “not free.”⁴⁸ The Arab Development Report in 2004 expanded on the issue of the deficit in freedoms and prophetically warned:

If the repressive situation in Arab countries today continues, intensified societal conflict is likely to follow. In the absence of peaceful and effective mechanisms to address injustice and achieve political alternation, some might be tempted to embrace violent protest, with the risk of internal disorder.⁴⁹

⁴⁶ The models of protests that we develop investigate factors that change over time within each country. Characteristics that are constant over the time period we examine, such as whether the country is an oil exporter, are controlled for using country fixed effects.

⁴⁷ United Nations Development Programme and Arab Fund for Economic and Social Development, *Arab Human Development Report, 2002: Creating Opportunities for Future Generations*, (New York: United Nations Development Programme, Regional Bureau for Arab States, 2002).

⁴⁸ Karin Karlekar, “Press Freedom in 2009: Broad Setbacks to Global Media Freedom”, accessed at <https://freedomhouse.org/report/freedom-press/freedom-press-2010>.

⁴⁹ United Nations Development Programme, Arab Fund for Economic and Social Development, and Arab Gulf Programme for United Nations Development Organizations, *Arab Human Development Report, 2004: Towards freedom in the Arab World*, (New York: United Nations Development Programme, Regional Bureau for Arab States, 2005), 19.

Regardless of regime type, maintaining legitimacy has always been a challenge for governments in the Middle East and North Africa.⁵⁰ Legitimacy in the Middle East has depended largely on the ability of governments to provide stability and social and welfare benefits. Opposition to regimes due to political and economic grievances can be mitigated if political leaders are able to use government spending as a way to buy support from important constituencies, but recent economic structural reforms curtailed government spending.⁵¹ Oil-producing states have an advantage over non-oil producing states in that their greater revenues allow them more opportunity to provide subsidies and benefits to citizens who are making political demands.

Another consideration when evaluating the causes of protests is the state's capacity to resist or halt such protests. Although state capacity is a multidimensional concept, two reasonable indicators are a state's repressive power and its economic power.⁵² Scholars have pointed to differences in state capabilities to help account for the success or failure of protests during the Arab Spring. For example, Bellin and Barany highlight the role of the military and the repressive capability of the state in explaining regime survival in the Arab Spring.⁵³ In their model, Brownlee, Masoud, and Reynolds also focus on the coercive capabilities of states to explain the outcome of revolts.⁵⁴ One might also use the repressive capability of states to

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⁵⁰ Michael Hudson, *Arab Politics: The Search for Legitimacy* (New Haven, CT: Yale University Press, 1977).

⁵¹ Sean Yom and F. Gregory Gause III, "Resilient Royals: How Arab Monarchies Hang On," *Journal of Democracy* 23 (2012): 74-88.

⁵² Cullen Hendrix, "Measuring State Capacity: Theoretical and Empirical Implications for the Study of Civil Conflict," *Journal of Peace Research* 47 (2010): 273-285.

⁵³ Eva Bellin, "Reconsidering the Robustness of Authoritarianism in the Middle East," *Comparative Politics* 44 (2012):127-149.; and Barany, "Comparing the Arab Revolts: The Role of the Military," ~~[page range deleted because it's the full range for this article; if you would like to cite specific pages, please do so; otherwise, this is okay].~~

⁵⁴ Brownlee, Masoud, and Reynolds, *The Arab Spring*.

explain the level or number of protests.⁵⁵ However, Nassif highlights the importance of disaggregating the repressive capability of the state into different actors and examining the different rivalries within the military and across other repressive groups in order to understand the unfolding events of the Tunisian case.⁵⁶ Also, a regime's use of force could have an ambiguous effect on the number of protests. The goal of the government in using force is to raise the cost of protesting and discourage others from joining in. Repression, however, could lead to a backfire dynamic in which repressive acts are seen as unjust and lead uncommitted citizens to side with the protesters, as Hess and Martin and Schock describe.⁵⁷ For example, violence against protesters in the Egyptian case led to outrage or moral shock, which greatly increased the number of protesters. According to Jumet, participating in the protests was particularly likely among citizens who combined moral shock with empathy with the victims.⁵⁸

The Middle East has consistently been singled out for its corruption, lack of public accountability, and weakness of the rule of law. On this point, the Arab Barometer 2011 survey asked respondents, "Do you think that there is corruption within the state's institutions and agencies?"; 80% of Egyptians and 69% of Tunisians responded "yes" to this question.⁵⁹

Furthermore, most states in the region can be defined as weak states, as measured by The Fund

⁵⁵ For a discussion of the link between state capacity and the onset or outcome of internal violence, see the special issue on state capacity and civil war in the *Journal of Peace Research*, 47 (2010).

⁵⁶ H. B. Nassif, "A Military Besieged: The Armed Forces, the Police, and the Party in Bin 'Ali's Tunisia, 1987-2011," *International Journal of Middle East Studies* 47 (2015): 65-87.

⁵⁷ David Hess, and Brian Martin, "Repression, Backfire, and the Theory of Transformative Events," *Mobilization: An International Journal* 11 (2006): 249-267.; and Kurt Schock, "The Practice and Study of Civil Resistance," *Journal of Peace Research* 50 (2013): 277-290.

⁵⁸ Kira Jumet, *Contesting the Repressive State: Why Ordinary Egyptians Protested during the Arab Spring* (New York: Oxford University Press, 2018), 95-102.

⁵⁹ Arab Barometer, Arab Wave II: 2011, accessed at <http://www.arabbarometer.org/survey-data/data-analysis-tool/>.

for Peace's Failed State Index.⁶⁰ This has led some analysts to characterize the revolts as a rejection of sultanistic regimes.⁶¹ Others have defined the revolts as a rejection of the post-colonial state and as a call for the adoption of a new democratic formula.⁶²

It is not surprising that many explanations for the revolts highlight the role of political variables. The Tunisian regime prior to the revolts, for example, was defined as personalistic and corrupt, with few political or civil rights, despite the modernization process undertaken by former president Bourguiba from 1957 to 1987.⁶³ Under Ben Ali's rule (1987-2011), corruption dominated the workings of the regime, and domestic security services had a great deal of influence. The regime's practice of limiting free speech and torturing dissidents had much in common with the Eastern European dictators who lost power after the fall of the Berlin Wall in 1989.⁶⁴

Common explanations of the Egyptian revolt highlight political issues. Lesch singles out the impact of the 2010 elections and arrangements to make Mubarak's son the next president as critical causes of the uprisings.⁶⁵ Similarly, Shehata relates Mubarak's downfall to corruption and economic exclusion, alienation of the youth, the 2010 elections, and the issue of

⁶⁰ Ellen Lust, "Institutions and Governance," in *The Middle East*, ed. Ellen Lust (Washington, D.C.: CQ Press, 2011), 143-192, at 148.

⁶¹ Jack Goldstone, "Understanding the Revolutions of 2011: Weakness and Resilience in Middle Eastern Autocracies," *Foreign Affairs* 90 (May/June 2011): 8-16, at 8.

⁶² Jacqueline Ismael and Shereen Ismael, "The Arab Spring and the Uncivil State," *Arab Studies Quarterly* 35 (2013): 229-40, at 233.

⁶³ Jeffrey Coupe, "Tunisia," 702-29.

⁶⁴ Michelle Angrist, "Morning in Tunisia: The Frustrations of the Arab World Boil Over," in *The New Arab Revolt*, ed. Council on Foreign Relations (New York: Council on Foreign Relations, 2011), 75-80.

⁶⁵ Ann Lesch, "Egypt's Spring: Causes of the Revolution," *Middle East Policy* 18 (2011): 35-48, at 39.

succession.⁶⁶ Over the last two decades, the brutal practices of the government, on top of the restrictions on free speech and corruption, left many Egyptians alienated and frustrated.⁶⁷ These issues were also reflected in the demands of the protesters during the revolt: the ouster of Mubarak, new elections, the lifting of emergency laws, and changes to the constitution.

The revolts in Yemen were linked to the regimes' efforts to modify the constitution, the lack of democracy, and dissent within the regime dating back to 2009. Yemen has always been a precarious country politically. In 1994, the country experienced a two-month civil war in which North Yemen gained dominance over the country, and since 2007 protests in Yemen have been common.⁶⁸ Corruption is a serious problem. Yemen has held several elections since 1993, with multiple parties participating. However, the legislature is weak and ineffective, and Yemen ranks low on ratings for political and civil liberties.

Bahrain has a better record than other monarchies in the Gulf, since it has a parliament and political parties. However, that was not sufficient to prevent the spread of protests to the country in 2011. Protesters' demands in Bahrain included the removal of the prime minister, who had been in power for over 40 years, and the replacement of the monarchy with a republic.⁶⁹ Initially, the protests drew individuals from all sectors of society who were frustrated with the lack of political reforms that had originally been detailed in the passage of a 2001 referendum.⁷⁰ Over time, disagreements developed among different groups, which ended up making the

⁶⁶ Dina Shehata, "The Fall of the Pharaoh: How Hosni Mubarak's Reign Came to an End," *Foreign Affairs* 90 (May/June 2011): 26-32.

⁶⁷ Ann Lesch, "Egypt's Spring": Causes of the Revolution," *Middle East Policy* 18 (2011): 35-48; and Paul Amar, "Why Mubarak Is Out," *Jadaliyya* (February 1, 2011), available online at <http://www.jadaliyya.com/Details/23641/Why-Mubarak-is-Out>.

⁶⁸ Phillips, "Yemen."

⁶⁹ Noueihed and Warren, *The Battle for the Arab Spring*, 135-163.

⁷⁰ Stephen Zunes, "Bahrain's Arrested Revolution," *Arab Studies Quarterly* 35 (2013): 149-164, at 151-52.

opposition movement more sectarian. The main political grievance is the Shiite majority's discontent with the Sunni ruling minority, which discriminates against Shiites in major economic, political, and security spheres.

The main causes of the Libyan revolts are also connected to corruption and repression. Although Qadhafi promoted direct democracy through a series of congresses, he was still the head of the armed forces and the Guide of the Revolution. As a result of Qadhafi's ideas about democracy and capitalism, national institutions were weakened, and his authoritarian rule led to corruption, repression, and a lack of press freedom. Qadhafi was no different from other despots; he used torture, public executions, and purges to kill off any opposition.⁷¹

Politically, Syria is characterized by the lack of political freedom, inequality, and corruption.⁷² Badran cites political and economic grievances as the main cause of the revolts. Freedom House ratings for Syria on political and civil rights are among the lowest in the region.⁷³ Initially, however, observers did not think that the Arab Spring would spread to Syria because, unlike in Tunisia and Egypt, there was a leadership succession, as Bashar al-Assad succeeded his father in 2000, and Syrians were optimistic that reforms would quickly follow. Calls for reforms, led by the Movement for the Restoration of Civil Society in Syria, began with the Damascus Spring in 2000. These reform efforts were followed by a series of statements and documents such as Statement of the 99 Intellectuals, the Document of the One Thousand, the Statement of the Forum of the Supporters of Civil Society, and the Damascus Declaration for

⁷¹ Fouad Ajami, "The Arab Spring at One," *Foreign Affairs* 91 (March/April, 2012): 56-65.

⁷² Sami Moubayed, "Letter from Damascus: Will Syria Descend into Civil War?" *Current History* 110 (December 2011): 339-344; and Michael Broning, "The Sturdy House That Assad Built: Why Damascus Is Not Cairo," in *The New Arab Revolt*, ed. Council on Foreign Relations (New York: Council on Foreign Relations, 2011), 200-204.

⁷³ Badran, "Syria's Assad No Longer in Vogue," 210-14.

Democratic Change in 2005.⁷⁴ All of these statements singled out grievances that came to be identified with the revolts of 2011.

As the discussion above suggests, regime type can be an important factor affecting the level of protests in a country. The Middle East and North Africa region contains many regime types, including authoritarian states, monarchies, and partial democracies. In 2011, extensive and widespread protests unfolded in authoritarian states, which resulted in regime changes in Tunisia, Egypt, Yemen, and Libya (the latter with the help of outside intervention). The monarchies in general proved to be more resilient; although states such as Jordan, Kuwait, Morocco, and Saudi Arabia experienced small protests, these occurred for shorter periods of time and did not lead to regime change. A partial exception is Bahrain, which saw widespread mobilization, though the monarchy was able to stay in power due to outside intervention. In a finding related to regime types, Goldstone et al. show that factionalism within regimes, which is usually associated with “confrontational mass mobilization,” is an important determinant of political instability and civil wars.⁷⁵

Overall, the literature has emphasized corruption, coercive state capacity, low levels of government spending, regime type, and a lack of political freedom as important contributors to the Arab Spring movement, which leads us to form and test hypotheses regarding political variables in the following model in the statistical section:

⁷⁴ Sadek Al-Azm, “The Arab Spring: Why Exactly at this Time,” *Reason Papers* 33 (2011): 223-29 (translated by Steve Miller).

⁷⁵ Jack Goldstone, et al., “A Global Model for Forecasting Political Instability,” *American Journal of Political Science* 54 (2010): 190-208, at 196.

Political Model: An increase in the level of protests is associated with more authoritarian regimes, factionalism within the government, high levels of corruption, the lack of freedom, low levels of government spending, and low state capacity for repression.

Social Factors

The Middle East has witnessed a significant increase in modernization, as measured by urbanization, education, and development. Improvement in human development can be seen in increases in the Human Development Index, which contains variables along three dimensions: long and healthy life, knowledge, and standard of living, for countries in the region. Nonetheless, literacy rates are only slightly higher than in sub-Saharan countries, with most of the growth in education occurring at the university level.⁷⁶ Modernization theory links higher levels of education with higher levels of political participation.⁷⁷ In many of the countries that experienced prolonged protests, evidence suggests that the combination of an increase in years of schooling and poor employment prospects, particularly for college graduates, was a significant factor in the protests.⁷⁸ The theoretical linkage between the variables includes the idea that for the educated unemployed person, the opportunity cost is low for participating in political activities. As Khosrokhavar describes: “The demography of the Arab world and the educational system, together with the economy’s structural weaknesses, have engendered a strong irritation among the Arab world’s youth, laying the foundation for social movements against the regimes.”⁷⁹ In addition, urbanization coupled with high levels of education and unemployment

⁷⁶ Melani Cammett, “The Political Economy of Development in the Middle East,” 99-142.

⁷⁷ Lipset, “Social Requisites for Democracy,” 78-80; and James Davies, “Toward a Theory of Revolution,” *American Sociological Review* 27 (1962): 5-19.

⁷⁸ Campante and Chor, “Why Was the Arab World Poised for Revolution?,” at 174.

⁷⁹ Khosrokhavar, *The New Arab Revolutions that Shook the World*, 173.

has been found to be related to political discontent.⁸⁰ Increased urbanization in the Middle East led to the breaking of traditional ties and increased alienation from the existing order.⁸¹

Improvement in development, as measured by various indicators, can lead to a rise in expectations, which, if unmet, can lead to protests. Kuhn links gains in human development in the Arab states to political mobilization in Arab countries, as witnessed during the Arab Spring.⁸² Daelacoura singles out unmet expectations with respect to gainful employment as playing a role

⁸⁰ Jack Goldstone, "Population and Security: How Demographic Change Can Lead to Violent Conflict," *Journal of International Affairs* 56 (2002): 2-21, at 10.

⁸¹ Paul Pillar, "Alienation and Rebellion in the Arab World," *Mediterranean Quarterly* 22 (2011): 8-19.

⁸² Randall Kuhn, "On the Role of Human Development in the Arab Spring," 649-83.

in the revolts.⁸³ ~~Hudson notes uneven development as contributing to the protests.~~ ~~Finally, a rise in mortality, which indicates reduced quality of life, was~~ found to be significantly linked to political violence.⁸⁵

Commented [JH10]: This seems like random information here. RK: right, it's not related to the topic sentence.

Commented [CM11R10]: We cut this sentence. Agree, Hudson is not central to the point we are making here.

Many analysts have highlighted the connection between the youth bulge and protests in the region.⁸⁶ The youth population, particularly when it is educated and unemployed, can take greater risks and intensify low-intensity conflict by providing an available force for mobilization.⁸⁷ A large youth population also makes higher demands on government for jobs and services. For example, the Egyptian population experienced large growth in the last two decades, resulting in a youth bulge that came to comprise about one-third of the population. Countries such as Syria and Yemen also had increases in the 15- to 29-year-old age group. The youth population was the highest in Yemen, at 42%.⁸⁸ Moreover, if the age cohort measured is shifted to the 25- to 39-year-old range (beyond the strict definition of a youth bulge), a marked increase in the percentage of population in this age group from 1980 to 2010 is visible in most of the countries involved in the Arab Spring.⁸⁹

As with population pressures, much has been made of the role that social media played in the Arab Spring. Within the last decade, the Arab world has seen a growth in access to media and technology, such as satellites, the internet, and cell phones. In 2010, the rich Gulf states, such as Bahrain (55%), Kuwait (61%), Qatar (69%), and the United Arab Emirates (68%) had the highest percentage of citizens using the internet, while Tunisia (37%), Egypt (22%), Syria (21%), Libya (14%) and Yemen (12%) had smaller percentages of internet users.⁹⁰ Husain and Howard point out that “it is true that Facebook and Twitter did not *cause* [sic] revolutions, but it is bad analysis to ignore the strategic and intentional uses of digital media in political ways.”⁹¹ The use of social media allowed the opposition to publicize the atrocities of regimes, mobilize and organize protesters, and communicate with the outside world.⁹² Furthermore, Tufekci and

Wilson show through surveys they conducted with Egyptian protestors in Tahrir Square during the first two months of 2011 that social media in general was instrumental in helping participants learn about the protests and become involved in the demonstrations.⁹³

Social media had the effect of making it easier and less costly for individuals to protest, by allowing protestors to see that there were other people with similar feelings. Kuran shows how demonstrations can reveal preference falsification, that is, the hidden opposition to the regime.⁹⁴ However, Brown suggests that Egyptians did not hide their preferences (there was plenty of criticism of Mubarak), but that the Arab Spring demonstrations showed individuals

⁸³ Delacoura, "The 2011 Uprisings in the Arab Middle East," 63-79.

⁸⁴ Michael Hudson, "The Middle East in Flux," *Current History* 110 (2011): 364-69.

⁸⁵ Henrik Urdal, "People vs. Malthus: Population Pressure, environmental Degradation, and Armed Conflict Revisited," *Journal of Peace Research* 42 (2005): 417-434, at 428.

⁸⁶ Diane Singerman, "Youth, Gender, and Dignity in the Egyptian Uprising," 1-27; and Filipe Campante and Davin Chor, "Why was the Arab World Poised for Revolution? Schooling, Economic Opportunities, and the Arab Spring," 167-87.

⁸⁷ Henrik Urdal, "A Clash of Generations? Youth Bulges and Political Violence," *International Studies Quarterly* 50 (2006): 607-629; and Richard Cincotta and John Doces, "The Age-Structural Maturity Thesis: The Impact of the Youth Bulge on the Advent and Stability of Liberal Democracy," in *Political Demography*, ed. Jack Goldstone (Boulder, CO: Paradigm Publishers, 2011), 98-116.

⁸⁸ Adeel Malik and Bassem Awadallah, "The Economics of the Arab Spring," *World Development* 45 (2013): 296-313.

⁸⁹ Campante and Chor, "Why was the Arab World Poised for Revolution?" 167-87.

⁹⁰ World Bank data on individuals using the internet (% of population), <https://data.worldbank.org/indicator/IT.NET.USER.ZS>

⁹¹ M. Muzammil Hussain and Philip Howard, "What Best Explains Successful Protest Cascades?" *International Studies Review* 15 (2013): 48-66, at 62.

⁹² Simon Cottle, "Media and the Arab Uprisings of 2011: Research Notes," *Journalism* 12 (2011): 647-649; and Marc Lynch, *The Arab Uprising: The Unfinished Revolutions of the New Middle East* (New York, NY: PublicAffairs, 2012), 67-99.

⁹³ Zeynep Tufekci and Christopher Wilson, "Social Media and the Decision to Participate in Political Protests: Observations from Tahrir Square," *Journal of Communication* 62 (2012): 63-379.

⁹⁴ Timur Kuran, "Now Out of Never: The Element of Surprise in the East European Revolution of 1989," *World Politics* 44 (1991): 7-48, at 18.

what was possible.⁹⁵ Khamis, Gold, and Vaughn suggest that new media platforms (Facebook, Twitter, Youtube) served different functions for protesters and were critical to the protests because they “served to accelerate political transformation, energize civil society, and catalyze public mobilization.”⁹⁶ Thus, as Lim suggests, social media played a role by allowing individuals to make contact, which is important for mobilization.⁹⁷ Social media also were a major source of news about the events of the Arab Spring for actors outside the region.⁹⁸ More specifically, Twitter data consumption shows that social media was a vehicle for conveying information to outside parties and that traffic through Twitter “was functioning like a megaphone, generating external attention from citizens, news media, and governments outside the country.”⁹⁹ Such information about the existence and extent of protests to individuals within and outside a country can persuade others to join because of the perceived reduction in costs and risks of participation, as Lohmann has shown in the case of East Germany.¹⁰⁰

Although Brynen et al. argue that the new media in the Arab world played an “enabling role” in the uprisings, Wilson and Dunn show that when it came to protester communication and organization, traditional media was cited as being more important for Tahrir Square protesters in

⁹⁵ Nathan Brown, “Constitutional Revolutions and the Public Sphere,” in *The Arab Uprisings Explained*, ed. Marc Lynch (New York: Columbia University Press, 2014), 296-312, at 298.

⁹⁶ Sahar Khamis, Paul Gold, and Katherine Vaughn, “Beyond Egypt’s “Facebook Revolution” and Syria’s “YouTube Uprising”: Comparing Political Contexts, Actors and Communication Strategies,” *Arab Media and Society* 15 (2012): 1-30, at 4.

⁹⁷ Merlyna Lim, “Clicks, Cabs, and Coffee Houses: Social Media and Oppositional Movements in Egypt, 2004-2011,” *Journal of Communication* 62 (2012): 231-248.

⁹⁸ Philip Howard, Aiden Duffy, Deen Freelon, Muzammil Hussain, Will Mari, and Marwa Mazaid, *Opening Closed Regimes* (Seattle WA: Project on Information Technology & Political Islam, 2011), 9; .

⁹⁹ Sean Aday, Henry Farrell, Deen Freelon, Marc Lynch, John Sides, and Michael Dewar, “Watching from Afar: Media Consumption Patterns Around the Arab Spring,” *American Behavioral Scientist* 57 (2013): 899-919, at 912.

¹⁰⁰ Susanne Lohman, “The Dynamics of Informational Cascades: The Monday Demonstrations in Leipzig, East Germany, 1989-91,” *World Politics* 47 (1994): 42-101.

a survey covering the period from January to March 2011.¹⁰¹ Thus, one should not ignore the role of old media, such as Al Jazeera. Since its founding, Al Jazeera's focus on politics and a transnational audience of Arabs made it possible for it to play an important role in creating the Arab public sphere.¹⁰² During the protests in 2011, Al Jazeera was key in transmitting videos recorded on cell phones, reporting on events, and allowing protesters to see events in real time, particularly for the early cases of Tunisia and Egypt.¹⁰³ As those cases show, the integration of new and old media helped to spread protests across the region.

This discussion of social factors in the Arab Spring leads us to test hypotheses concerning social variables in the following model:

Social Model: An increase in the level of protests is correlated with a large youth bulge, high access to cell phones and the internet, high infant mortality rates, high urbanization rates, and high education levels.

II. Data and Statistical Models

In this section, we describe the data and statistical models used to test the hypotheses discussed above. The dependent variable used in the empirical models is the average daily number of [events classified as](#) protests and demands for political reform in a country in a given year. The data source is the Global Data on Events, Location, and Tone (GDELT), which captures events reported in online, broadcast, and print news sources. The events data is based

¹⁰¹ Rex Brynen et al., *Beyond the Arab Spring: Authoritarianism & Democratization in the Arab World* (Boulder, CO: Lynne Rienner Publishers, 2012), 234; and Christopher Wilson and Alexandra Dunn, "Digital Media in the Egyptian Revolution: Descriptive Analysis from the Tahrir Data Sets," *International Journal of Communication* 5 (2011):1248-72, at 1252.

¹⁰² Marc Lynch, *Voices of the New Arab Public: Al-Jazeera, Iraq and Arab Politics Today* (New York: Columbia University Press, 2006).

¹⁰³ Brynen et al. "Beyond the Arab Spring."

on over 250 million records dating back to 1979; the historical data set we use relies heavily on AfricaNews, Agence France Presse, Associated Press, Associated Press Online, Associated Press Worldstream, BBC Monitoring, the *Christian Science Monitor*, Facts on File, Foreign Broadcast Information Service, the *New York Times*, United Press International, and the *Washington Post*. Each news story is read by a machine that classifies events in the story based on the Conflict and Mediation Event Observation Event and Actor (CAMEO) codes.¹⁰⁴ From these event codes, we count the number of protests in a country as the number of events falling into one of the following categories: engagements in political dissent and demands for political reform that involve demonstrations, rallies, strikes, boycotts, obstruction of passage, demands, or violent protests. We also test our model using a broader measure of the revolts that includes assaults, fights, seizure of property, threats of political dissent, criticism of abuses, appeals for political reform, rejections of agreements, and mediation or negotiations.

The sample is made up of 19 of the 22 members of the Arab League from 1990 to 2011. This includes all of the Arab League members except for three countries excluded from the analysis due to lack of data: Palestine, Somalia, and Sudan. Notice that while the analysis focuses on the Arab world, we do not select our sample based on the dependent variable. Instead, we include almost all of the countries in the Arab League, both those where a strong

¹⁰⁴ Nicholas Weller and Kenneth McCubbins (in “Raining on the Parade: Some Cautions Regarding the Global Database of Events, Language, and Tone Dataset,” *Political Violence @ A Glance*, 2014, at <http://politicalviolenceataglance.org>) [CV: this is okay in parens] discuss some concerns about this dataset. One is that events may be counted multiple times because more than one news source reported on it. This possibility creates measurement error in our dependent variable, which is intended to show the number of protests in each country. This type of measurement error is unlikely to be correlated with the explanatory variables in the model, so it will not create a bias in the coefficient estimates. The measurement error will, however, inflate the standard errors of the coefficients in the regressions and thus will make it less likely that our coefficient estimates are statistically significant.

protest movement occurred in 2011 and those where protests did not increase. Using what is nearly the full set of Arab League countries allows us to investigate why mass protests arose in some Arab countries but not in others.

In the regressions that are presented in the next section, we estimate the models using data from 1990 to 2011. We chose to end the sample in 2011 in order to alleviate a concern that the massive protests that year might have significant impacts on the economic, political, and social explanatory variables. Since the explanatory variables are lagged by one year, they will not be affected by the 2011 protests.¹⁰⁵

Figure 1 displays our measure of protests and demands beginning December 17, 2010 through August 31, 2011. This measure nicely captures the timeline of the Arab Spring. Protests and demands spiked first in Tunisia, following Mohammed Bouazizi's self-immolation on December 17, 2010. Bouazizi's stand against the government then inspired widespread protests in Tunisia and led to the resignation of President Ben Ali on January 14, 2011. Following those events, Egypt saw a dramatic increase in protests beginning in January 2011, which led to the resignation of longtime President Hosni Mubarak on February 11. Protests subsequently surged in Yemen, Libya, Bahrain, and Syria, as illustrated in Figure 1. Other Arab League countries did not experience the same level of sustained mass protests, although some protests did occur there. For those countries, the moving average number of protests peaked at 20 per day on February 22, 2011, fell below 10 per day by March 22, and remained below 10 per day for the rest of 2011 and most of 2012. In Saudi Arabia, for example, the moving average of protests briefly peaked at 78 per day in early March 2011. The king pledged \$130 billion in

¹⁰⁵ We also investigated using two- or three-year lags for the explanatory variables, but this did not change our conclusions.

economic and social benefits, however, and by the end of March, protests had declined dramatically. Protests remained at low levels for most of 2011 and 2012. Jordan had some sustained protests in early 2011 but relatively few after March of that year. Morocco and Kuwait experienced fewer protests: each had only 6 days in all of 2011 with more than 30 news event reports of protests. In Jordan and Morocco, the protests died down after the governments in both cases implemented meaningful political reforms. In Kuwait, demonstrations led to the resignation of the prime minister and the dissolution of parliament. The fear of a renewed civil war in Algeria prevented sustained levels of protests in the country. There was calm and stability in Qatar and the United Arab Emirates, presumably partly due to the oil wealth of the countries. In the cases of Iraq and Lebanon, no significant and sustained demonstrations occurred.

-- Figure 1 About Here --

We present four main regression models: an economic model, a political model, a social model, and a complete model including all the economic, political, and social variables. The economic model presented in equation 1 includes five variables: GDP per capita, GDP per capita growth, inflation, trade openness, and the youth unemployment rate. In all of the models, we include a time trend and population as control variables, the latter because larger countries will have more protests on average. These variables (except openness) come from the World Bank World Development Indicators. Openness comes from the United Nations Conference on Trade and Development (UNCTAD) statistics; it is the sum of a country's exports and imports as a share of its GDP.

(1)

$$\text{Protests}_{it} = \beta_0 t + \beta_1 \text{GDP per capita}_{it} + \beta_2 \text{Growth}_{it} + \beta_3 \text{Inflation}_{it} + \beta_4 \text{Openness}_{it} + \beta_5 \text{Youth unemployment}_{it} + \beta_6 \text{Population}_{it} + \beta_7 t + \varepsilon_{it}$$

Field Code Changed

Equation 2 specifies our political model. Corruption is measured using Transparency International's Corruption Perception Index, where higher numbers indicate less corruption. Government type is measured using three variables from Goldstone et al.¹⁰⁶ These authors classify governments as pure autocracies, partial democracies, partial democracies with factionalism, and pure democracies.¹⁰⁷ There were no countries in our data set that were pure democracies, so we include dummy variables for partial autocracies, partial democracies, and partial democracies with factionalism. Countries in the Arab League they classified as being partial democracies with factionalism were Comoros before 2000, Djibouti after 1999, Iraq after 2010, and Lebanon after 2005. The freedom variable is a composite measure called the empowerment index in the Cingranelli-Richards Human Rights Dataset; it comprises workers' rights, electoral self-determination, freedom to move across borders and within the country,

¹⁰⁶ Goldstone et al., 2010, "A Global Model for Forecasting Political Instability," 190-208.

¹⁰⁷ Government type is defined based on Polity IV scales of the openness of executive recruitment and the competitiveness of political participation. Pure autocracies are "systems that combine an absence of effective contestation for chief executive with repressed or suppressed political participation." Partial democracies are "systems in which the chief executive is chosen through competitive elections and political competition is not effectively repressed, but either elections are not fully free and fair, or political participation is not fully open and well institutionalized." Factionalism is defined "as a pattern of sharply polarized and uncompromising competition between blocs pursuing parochial interests at the national level. This winner-take-all approach to politics is often accompanied by confrontational mass mobilization ... and by the intimidation or manipulation of electoral competition." See Goldstone et al., "A Global Model for Forecasting Political Instability," 195-96.

freedom of speech and assembly, and freedom of religion.¹⁰⁸ It ranges from 0 (no rights) to 14 (full rights in all categories). We use the physical integrity variable from the same dataset as a proxy measure of a state's capacity for (and willingness to use) repression.¹⁰⁹ The variable measures the extent of torture, extrajudicial killing, political imprisonment, and disappearances in the country, and it ranges from 0 (no government respect for the physical integrity of its citizens in these areas) to 8 (full government respect for citizens' physical integrity). Total government expenditures as a share of GDP comes from the World Bank World Development Indicators dataset. If a data point was missing, it was replaced with the value from the year closest in time to the missing year.

(2)

$$\text{Protests}_{it} = \gamma_0 t + \gamma_1 \text{Corruption}_{it} + \gamma_2 \text{Government type variables}_{it} + \gamma_3 \text{Freedom}_{it} + \gamma_4 \text{Govt spending}_{it} + \gamma_5 \text{Physical Integrity}_{it} + \gamma_6 \text{Population}_{it} + \gamma_7 t + \mu_{it}$$

Our social model is displayed in equation 3. To measure the impact of social media, we summed the number of internet users and the number of mobile phone subscriptions per 100 people. The urban variable is the percentage of the population living in urban areas of more than one million people. Infant mortality is the number of deaths before age one per 1,000 live births. These three variables come from the World Bank World Development Indicators. The youth bulge is defined as the percentage of the population aged 15 to 24. Education is measured as the mean years of schooling in the country for people age 25 and older; this variable comes from the United Nations Human Development Reports.

¹⁰⁸ David L. Cingranelli, David L. Richards, and K. Chad Clay, *The CIRI Human Rights Dataset*, at <http://www.humanrightsdata.com>. Version 2014.04.14.

¹⁰⁹ The physical integrity variable has an ambiguous theoretical impact on protests. More government repression could act to suppress protests or it could lead to more protests in response to the repression.

(3)

$$\text{Protests} = \theta_{0t} + \theta_1 \text{Communication}_{it} + \theta_2 \text{Urban}_{it} + \theta_3 \text{Infant mortality}_{it} + \theta_4 \text{Youth bulge}_{it} \\ + \theta_5 \text{Education} + \theta_6 \text{Population}_{it} + \theta_7 t + \delta_{it}$$

IV. Results

Table 1 presents Ordinary Least Squares estimates of the economic, political, and social models predicting protests and demands in Arab League countries.¹¹⁰ Some of the explanatory variables are correlated with each other. One measure of multicollinearity is the variance inflation factor (VIF), which shows how much larger the variance of the coefficient is than it would be if the explanatory variable were uncorrelated with all of the other independent variables in the regression. O'Brien describes a common rule of thumb being that a VIF greater than 10 is a sign of serious multicollinearity.¹¹¹ Only two of the variables in Table 1 have VIFs above this value: the urban (VIF = 20) and infant mortality (VIF = 10.4) variables in the full model. As Goldberger notes, however, this multicollinearity does not cause a bias in any of the coefficient estimates and it does not prevent us from determining whether the groups of variables in the models are good predictors of the variation in protests across countries or over time.¹¹² In the economic model, higher inflation and lower GDP per capita are associated with increased levels of protest. Arab League countries that are more open to trade also had significantly more protests over this period. These results are consistent with the hypotheses about how the

¹¹⁰ We estimate a linear regression because only 4 of the 339 observations used in the full model in Table 1 had a value of zero for the protests dependent variable. The linear model fits the data better than alternatives such as a Poisson or Tobit model.

¹¹¹ Robert O'Brien, "A Caution Regarding Rules of Thumb for Variance Inflation Factors," *Quality and Quantity* 41 (2007): 673-690, at 673.

¹¹² Arthur Goldberger, *A Course in Econometrics* (Cambridge, MA: Harvard University Press, 1991), 245-53.

economic conditions in a country will affect its level of protests. However, there was no statistically significant relationship between protests and either GDP per capita growth or youth unemployment rates.¹¹³ An F-test shows that the economic variables are statistically significant as a group at the 5% level, so there is evidence that protests in the Arab world do respond to countries' economic conditions.

-- Table 1 About Here --

The next column of estimates shows that the political variables are statistically significant as a group in affecting protests, as shown by the F-test. However, the only political variable that by itself significantly affects protests is the physical integrity variable. There are more protests in countries in which citizens are more subject to physical attacks and imprisonment, which suggests that there was a backlash against government repression. There is no evidence that protests are significantly linked to corruption or to government spending as a share of GDP, although there are measurement issues regarding Transparency International's corruption variable, which relies on perceptions of corruption from country experts.¹¹⁴ A superior measure of corruption would measure acts of corruption rather than perceptions, but this data is largely unavailable except in case studies. For government type, the omitted category in the regression is pure autocracy, so the coefficient estimates indicate the effect on protests of the country having a partial autocracy, partial democracy, or a partial democracy with factions instead of

Commented [RK12]: Okay? Presumably they are subject to repression in all countries, just more in some than in others.

Commented [CM13R12]: Yes, adding "more" here is good.

¹¹³ Using the overall unemployment rate instead of the youth unemployment rate gives a similar result: unemployment does not significantly affect protests.

¹¹⁴ Staffan Andersson and Paul M. Heywood, "The Politics of Perception: Use and Abuse of Transparency International's Approach to Measuring Corruption," *Political Studies* 57 (2009): 746-67, at 752-54.

having a pure autocracy. The government type variables do not have a statistically significant impact on protests in Table 1, although they do in later regressions.¹¹⁵

The third column shows that the social variables, considered in isolation from the other groups of variables, do not significantly affect protests, either individually or as a group. By contrast, the population and time trend control variables included in each of these three models are both statistically significant. Countries with larger populations have more protests, as expected, and there is an upward trend over time in the number of protests in each country. This last result could simply reflect more news reporting of protests in recent years, or it could indicate gradually growing dissatisfaction with the governments in the Arab League countries.

The final column in Table 1 shows the results of the full model. Including all the determinants of protests and demands affects the magnitude and significance level of the estimated coefficients. In this full model, protests are significantly higher in countries that have high youth unemployment rates and that have greater levels of perceived corruption.¹¹⁶ Protests are also significantly higher in countries where internet and cell phone use are more common and in those that are more rural, that have lower infant mortality, and that have smaller shares of youths in the population. The result for internet and cell phone use supports the narrative that social media helped to coordinate and promote the mass gatherings in the Arab Spring. The youth bulge result is surprising, however, and we examine it in greater detail below, where we look at the possibility that a youth bulge leads to protests only when it is combined with a lack of

¹¹⁵ An alternative measure of government type (available at <http://www.systemicpeace.org/polityproject.html>) is the Polity IV Project's overall score, which measures the level of democracy on a scale from -10 (pure autocracy) to 10 (pure democracy). The Polity score never significantly affects protests in our data set when it is included as an explanatory variable, either alone or in combination with the Polity score squared.

¹¹⁶ A higher number for the corruption control variable indicates that there is less corruption.

economic opportunities. In the full model, the groups of political and social variables are found to have a statistically significant impact on protests, but the economic variables as a group do not. The population and time trend variables are not statistically significant in the full model, although the coefficients on both variables remain positive. The full model is our preferred model because it provides the clearest ceteris paribus estimated effect of each variable on protests (i.e., the impact of each variable on protests after all the other economic, political, and social variables are controlled for).

Table 1 does not include lagged protests as an explanatory variable in the models. Our goal is to estimate the underlying structural determinants of the protests rather than to use lagged protests to predict current protests. However, including a lagged dependent variable (or one-, two- and three-year lags of protests) in the model does not change the results. None of the statistically significant coefficients in the full model in Table 1 changes signs when lagged protests are included in the estimation, and only one (the coefficient on government spending) loses its statistical significance. Examination of Cook's D statistic also suggests that the coefficient estimates in Table 1 are not strongly influenced by any outlier observations.¹¹⁷ We did investigate the instances when results are driven by the inclusion of a particular country in the regressions, and we discuss one such case below.

It is possible that the results in Table 1 are biased by country-specific fixed effects, such as geographical or cultural factors that are correlated with the explanatory variables in the model. In order to control for factors specific to each country, Table 2 presents the results of estimates

¹¹⁷ Cook and Weisberg suggest that a D statistic above one is a reasonable indicator that an outlier has a large impact on the coefficient estimates. The maximum value of the D statistic in the full model of Table 1 was 0.52. See R. Dennis Cook and Sanford Weisberg, *Residuals and Influence in Regression* (New York: Chapman and Hall, 1982), 118; and R. Dennis Cook, "Detection of Influential Observations in Linear Regression," *Technometrics* 19 (1977): 15-18.

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including country fixed effects.¹¹⁸ The estimates in Table 2 are similar to the estimates in Table 1. In Table 2, countries are found to have significantly more protests if they have high inflation. Youth unemployment rates did not significantly affect protests in any of the Table 2 regressions. As Cammett et al. note, youth unemployment was high but not a new development in the region.¹¹⁹ By contrast, protests rose significantly if there was an increase in the country's corruption or a decrease in its citizens' freedoms. Also, an increase in internet and cell phone use is associated with a rise in protests. Compared to full autocracies, protests are significantly lower in partial democracies but significantly higher in countries whose government is a partial democracy with factionalism. This latter result is consistent with Goldstone et al., who show that the risk of the onset of instability in a country is extraordinarily high if the government is a partial democracy with factionalism.¹²⁰ Regression estimates shown later in the results section also provide evidence in favor of this conclusion. We should note, however, that in the Arab League countries, this effect is largely driven by the case of Lebanon, which was classified as a partial democracy with factionalism in 2005. Lebanon experienced a large increase in protests from 2005 to 2011, starting with domestic and international pressure to force Syria to withdraw from the country, Hizballah's 2006 war with Israel, and the deadlock among the different communal groups linked to elections in the country. If we drop Lebanon from the analysis, the partial democracy with factionalism variable no longer has a statistically significant impact on protests.

¹¹⁸ The country fixed effects will capture the impact of any factors that affect a country's level of protests and that are constant over the time period we examine. These factors include, among other things, whether the country has traditionally been ruled by a monarchy and whether the country's economy is heavily dependent on oil.

¹¹⁹ Cammett et al., *A Political Economy of the Middle East*.

¹²⁰ Goldstone et al., "A Global Model for Forecasting Political Instability," 195.

-- Table 2 About Here --

For purposes of comparison, the final column of Table 2 presents estimates of the full model but using data only from the years prior to the 2011 Arab Spring protests. High inflation and partial democracy with factionalism were both significantly linked to greater protests in both the Arab Spring and the pre-Arab Spring periods. Interestingly, the variable measuring citizens' freedom does not influence protests in the pre-Arab Spring period, but more freedom is associated with lower protests when we include the Arab Spring 2011 year. Internet and cell phone usage also has no significant impact on protests in the period prior to 2011, but apparently it did lead to increased protests when 2011 was included in the regression. Countries that had heavily urban populations had significantly fewer protests prior to 2011, but when 2011 is included in the regression, the coefficient becomes insignificantly positive.

One possible criticism of the analysis in Tables 1 and 2 is that the dependent variable (number of events reported involving protests and demands for political change) is too narrow to capture the extent of domestic unrest. Therefore, for the regressions reported in Table 3, we broadened the definition of the dependent variable to include events classified not just as protests and demands for political change, but also assaults, fights, seizure of property, threats of political dissent, criticism of abuses, appeals for political reform, rejections of agreements, and mediation or negotiations. The results using this more inclusive dependent variable are similar to those in Table 2. Table 3 shows that inflation remains positively associated with violent activities, although the coefficient is statistically significant in the economic model but not in the full model. Partially democracies with factionalism also remain positively related to the violent

actions, although again the coefficient is significant only in the political and not in the full model. The coefficient on the freedom variable maintains its negative sign in Table 3, but it is no longer statistically significant. The other significant variables in Table 2 (internet and cell phone use, youth bulge, and population) keep their signs and significance. Most of the coefficient estimates in Table 3 are larger in magnitude than those in Table 2 because the dependent variable in that table is about three times larger on average.

-- Table 3 About Here --

One surprising result emerging from this entire analysis, as shown in Tables 1-3, is that countries with a larger percentage of youths aged 15-24 had lower levels of protests, and the negative coefficient on the youth bulge variable is usually statistically significant.¹²¹ The full models in Tables 1 and 2 estimate that each extra percentage point of the population that is between the ages of 15 and 24 reduces the number of protests per day by about 0.5. This means that a one standard deviation increase in the youth bulge lowers protests by about 0.2 standard deviations. This runs counter to the conventional wisdom on the Arab Spring, which sees the movement as being driven by angry youths taking to the streets to protest and rebel against the government in power. Figure 2 reveals one reason why the coefficient estimate on the youth bulge is negative rather than the positive coefficient that other studies have predicted. The figure

¹²¹ Campante and Chor, “Why Was the Arab World Poised for Revolution?” suggest that the 25-39 year-old age cohort might be more important in explaining the Arab Spring uprisings. The data we have available are on populations from ages 15 to 24 and from 15 to 39. We investigated whether our results would change if we measured the youth bulge to be the percentage of the population between ages 15 and 39. The conclusion from Tables 1-3 is unchanged even with this more expansive definition of the youth population.

shows the average percentage of youths 15-24 years old in the population of the six main Arab Spring countries (Bahrain, Egypt, Libya, Syria, Tunisia, and Yemen) as well as the average for the other Arab League countries and the average for the world. As the figure shows, there was a decline in the Arab Spring countries' average youth bulge after 2006; each of the Arab Spring countries except Yemen had a declining proportion of youths in their populations in the years leading up to 2011. Also, the six countries with sustained protests during the Arab Spring had a youth percentage of the population that was virtually identical to the rest of the Arab League countries from 2009 onward. Thus, a bulge in the youth population cannot explain the timing of the Arab Spring protests. Nor can it explain why the protests were stronger in some Arab League countries than in others.

-- Figure 2 About Here --

However, it might be argued that the mere existence of a youth bulge is not sufficient for protests, and that one must also take into account the grievances of the youths. High proportions of youth offer societies an important demographic that can, under the right conditions, be dynamic and good for economic growth and general prosperity. On the other hand, a large youth population can lead to conflict if it is combined with other characteristics such as a lack of economic opportunities.¹²² Young and highly educated but unemployed males are most likely to be frustrated and turn out to protest. We investigate this possibility in the regressions reported in Table 4.

The first column in Table 4 investigates the hypothesis that a youth bulge leads to protests when it is combined with high education and high unemployment. To test this idea, we started with the full model from Table 2 and added interaction terms to capture any interaction

¹²² Campante and Chor, "Why was the Arab World Poised for Revolution?" 169.

among the youth bulge variable, mean years of schooling and youth unemployment rates. One of the coefficients on the interaction terms is statistically significant, but only at the 10% level, and it suggests that protests may be higher in countries with a combination of high education and high youth levels. The coefficients on the interaction terms are also mostly positive, which is consistent with the hypothesis. Nonetheless, the interaction terms as a group have an insignificant impact on protests. Thus, there is no strong evidence in the data that a youth bulge can explain the protests in the Arab world, even when it is combined with high unemployment rates among an educated population.

-- Table 4 About Here --

The estimation thus far has examined factors that affected the intensity of protests in Arab League countries. The dramatic spike in protests in 2011 in many of the countries suggests that something unusual happened in that year. The second column in Table 4 thus includes a dummy variable for the year 2011 in order to capture changes in protests in 2011 that are not explained by the economic, political, and social factors within each country. Thus, the model divides the changes in protests into the part that can be explained by the structural determinants of protests and the part that is unexplained. The coefficient on the year 2011 indicator variable is large, positive, and statistically significant at the 1% level. The coefficient on the variable shows that protests jumped by 14.5 protests per day in the year 2011 after controlling for the political, economic, and social factors that explain protests. The average daily number of protests in the Arab League nations rose from 1.4 per day in 2010 to 14.4 per day in 2011. Thus, the shift in

protests captured by the year 2011 dummy variable fully explains the increase in protests during the first year of the Arab Spring.

Does this result mean that the traditional economic, political, and social variables used to explain the Arab Spring do not have any true effect on protests? The answer depends on the model specification. In the fixed-effects model presented in Table 4, the economic, political and social variables do not have a jointly significant impact on protests once the year 2011 variable is included. With country fixed effects in the estimation, we interpret this result as meaning that changes in these 17 variables over time within each country are not significantly correlated with changes over time in the country's protests. Thus, changes in the structural variables in 2010 cannot explain why there was a large jump in protests in 2011. When the same model is estimated by ordinary least squares without country fixed effects, the economic, political, and social variables do significantly affect protests at the 5% significance level. The original model without fixed effects reveals whether or not the independent variables can explain both variation in protests across countries and variation in protests within a country over time. Since the fixed-effect estimation means that the variables do not explain changes in protests over time within each country, the significance of the variables in the original model indicates that these economic, political, and social variables do help explain variations in protests across countries (why protests were higher in some countries than in others).

If changes in the economic, political, and social variables in 2010 are unable to explain the surge in protests in 2011, then it is possible that transnational factors could explain the onset of the Arab Spring. This conclusion is similar to one made by Korotayev et al. who argue that the Arab Spring revolts may have been triggered by a "domino effect" in which instability in one

country moves into neighboring ones.¹²³ There is much literature on the effects of diffusion of conflicts in cases of interstate war¹²⁴ and civil war.¹²⁵ The onset of internal conflict can be affected by existing levels of conflict in the region, which can spill over to neighboring countries.¹²⁶ In the case of the Arab Spring, several works have highlighted the role of spillover and demonstration effects in explaining the spread of protests.¹²⁷ For example, the technique of occupying public spaces in the Arab Spring became a common practice in many countries. Weyland writes that “ample evidence shows that critical masses of people were magnetically drawn to the surprising success of the Tunisian uprising and eagerly jumped to the conclusion that they could repeat a similar feat in their own country.”¹²⁸ Furthermore, Mekouar singles out the role local political agents can play in advancing the diffusion of protests (in Tunisia and Egypt) or hindering them (in Algeria and Morocco).¹²⁹ This in some ways explains why the revolts managed to spread despite the differences in economic and political conditions in various

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¹²³ Andrey Korotayev, et al., “The Arab Spring: A Quantitative Analysis,” *Arab Studies Quarterly* 36 (2014): 149-69, at 166.

¹²⁴ For example, see Manus I. Midlarsky, “Analyzing Diffusion and Contagion Effects: The Urban Disorders of the 1960s,” *American Political Science Review* 72 (1978): 996-1008; and Randolph Siverson and Harvey Starr, *The Diffusion of War: A Study of Opportunity and Willingness* (Ann Arbor: University of Michigan, 1991).

¹²⁵ For example, see Alex Braithwaite, “Resisting Infection: How State Capacity Conditions Conflict Contagion,” *Journal of Peace Research* 47 (2010): 311-319; and Kristan Skrede Gleditsch, “Transnational Dimensions of Civil War,” *Journal of Peace Research* 44 (2007): 293-309.

¹²⁶ Havård Hegre and Nicholas Sambanis, “Sensitivity Analysis of Empirical Results on Civil War Onset,” *Journal of Conflict Resolution* 50 (2006): 508-535, at 529.

¹²⁷ Marc Lynch, “Media: Old and New,” 93-109; David Patel, Valerie Bunce, and Sharon Wolchik, “Diffusion and Demonstration” in *The Arab Uprisings Explained*, ed. Marc Lynch (New York: Columbia University Press, 2014), 57-74; Stephen Saideman, “When Conflict Spreads: Arab Spring and the Limits of Diffusion,” *International Interactions* 38 (2012): 713-722; and Kurt Weyland, “The Arab Spring: Why the Surprising Similarities with the Revolutionary Wave of 1848?,” *Perspectives on Politics* 10 (2012): 917-34, at 925.

¹²⁸ Weyland, “The Arab Spring,” 923.

¹²⁹ Merouan Mekouar, “No Political Agents, No Diffusion: Evidence from North Africa” *International Studies Review* 16 (2014): 206-216.

countries. It also should be noted that the process of diffusion and learning can spread to regimes that enhanced their survival by learning from and adapting to the spread of protests in neighboring countries.¹³⁰

As a first cut, the last column in Table 4 investigates the possibility that the protests were transmitted from one country to another. This model includes an explanatory variable counting the number of protests and demands in other Arab League countries, as well as an interaction term between this variable and the dummy variable for the year 2011. The coefficient on the other country protests variable is negative and statistically insignificant, suggesting that in the pre-2011 period, protests and demands did not spread across national boundaries. This result is not surprising given that social media did not have much presence in the Middle East and North Africa region prior to the 2000s. Moreover, most of these protests remained on a small scale and were related to specific grievances. As a result, governments were able to successfully use their power to contain or eliminate such threats. The interaction term for the Arab Spring period has a statistically significant positive coefficient, which means that protests in other countries had a larger positive impact on a country's protests in 2011 than they had in previous years. The sum of the coefficients on the interaction term and on the other country protests variable reveals how a country's 2011 protests were affected by protests in other Arab League nations. The fact that this sum is positive means that in 2011, protests in one Arab country did spread across borders and generated protests in other Arab countries. By 2011, the Arab public was much more socially connected through cell phones, the Internet, Facebook, and Twitter.¹³¹ However, the

¹³⁰ Steven Heydemann and Reinoud Leenders, "Authoritarian Learning and Counterrevolution," in *The Arab Uprisings Explained*, ed. Marc Lynch (New York: Columbia University Press, 2014), 75-92.

¹³¹ Lynch, "Media: Old and New," 93-109.

effect of diffusion or contagion of protests from one country to another is better studied using daily events data rather than the yearly data used in this paper and should be further investigated in that way in future research.

V. Conclusion

This research provides an empirical test of the structural explanations usually advanced to explain the onset of protests in late 2010 and early 2011 in the Arab world. We constructed models that rely on internal structural determinants, based on economic, political, and social explanations for the revolts of 2011. In investigating why some countries had more protests than other countries, we find the strongest evidence in support of political explanations for protests. The political variables were statistically significant as a group in all of the eight models in which they were included. We find that factionalism, high levels of corruption, and low levels of freedom contributed to protest movements.

Economic factors appear to be less important than political factors in explaining protests in the region. The group of economic variables had a significant effect on protests in only two of the eight models in Tables 1-3. High inflation was the only economic factor that consistently led to greater protests in the estimation.

Investigating social variables, our estimation provides some evidence that social media helped protesters to organize. We show, for instance, that internet and cell phone use significantly raised the number of protests during 2011, but did not significantly affect protests in earlier years. While Aday et al. provide evidence that social media acted as a megaphone in projecting information about the Arab Spring to countries outside the region, our results suggest

social media may also have acted as a rallying cry to organize protests.¹³² Most of the other social variables were not correlated with protests. The urban and education variables had statistically significant coefficients in only one of 11 models that we estimated, while the urban percentage of the population had a statistically significant negative impact on protests in only three of the 11 models.

Surprisingly, we find no evidence in any of our models for the argument that a bulge in the youth population caused the revolts. We conclude that while the youth bulge, which peaked in the Arab Spring states in 2004, cannot explain either the timing of the revolts or why the Arab Spring protests were stronger in some Arab countries than in others. We do not think that the youth bulge did not matter, but the evidence suggests the youth bulge is probably better thought of as a catalyst that must be turned on by some other variable. We investigated the role of education and unemployment as potential conditional variables, but did not find compelling evidence that these variables combined with the youth bulge were significantly correlated with protests. Future research can consider this puzzle in more detail by investigating alternative measures of education and unemployment as well as other potential variables that could have pushed the youth bulge to emerge as a catalyst to these events.

These findings thus support explanations that connect protests to social media, factionalism, corruption, a lack of freedom, and inflation. We do not find evidence that the Arab Spring was caused by a high youth unemployment rate or that government spending mitigated the protests. While the structural models that we estimate show that many variables had significant impacts on protests across countries, the models in Tables 1-3, which are based solely

¹³² Aday et al., “Watching from Afar: Media Consumption Patterns Around the Arab Spring,” 899-919.

on internal factors, do not explain why protests suddenly surged in 2011. In fact, we show that there was a rise in protests in 2011 that is unexplained by the political, economic, and social factors within each country. Although structural models of revolts can reveal which countries are ripe for protests, they are not sufficient to predict when such huge mobilization is likely to take place.¹³³ We present evidence that the dramatic increase in protests across the Arab League countries in 2011 can be explained largely as a response to protests that were occurring in other countries. In particular, the success of demonstrators in the cases of Tunisia and Egypt inspired demonstrations in other countries. This conclusion is similar to that of Korotayev et al.¹³⁴ They argue that a domino effect of instability spreading across the region explains why there was a surge of protests against regimes that had appeared to be stable prior to 2011. This demonstration effect was transmitted through the platforms of social media, which played an important role in mobilizing individuals to protest. These results make it understandable that the strength of the uprisings took most experts by surprise.

In conclusion, factionalism within governments, corruption, lack of freedom, and inflation provided conditions in many Arab League countries for strong protest movements to develop. However, any explanation for the magnitude or scale of such demonstrations in the Arab Spring must account not only for these internal factors, but also for the diffusion of protests across country borders through such mechanisms as social media.

¹³³ Jeff Goodwin, "Why We Were Surprised (Again) by the Arab Spring," *Swiss Political Science Review* 17 (2011): 452-456; Timur Kuran, "The Inevitability of Future Revolutionary Surprises," *American Journal of Sociology* 100 (1995): 1528-1551; and Charles Kurzman, "Can Understanding Undermine Explanation? The Confused Experience of Revolution," *Philosophy of the Social Sciences* 34 (2004): 328-351.

¹³⁴ Korotayev et al., "The Arab Spring: A Quantitative Analysis," 149-169, at 166.

[Table 1: Determinants of protests and demands, 1990 to 2011]

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| Variable | Economic | Political | Social | All variables |
|-----------------------------|--------------|--------------|-------------|---------------|
| GDP per capita | -0.039 * | | | -0.019 |
| GDPPC growth | 0.004 | | | -0.018 |
| Inflation | 0.021 * | | | 0.013 |
| Openness | 0.016 ** | | | 0.017 |
| Youth UR | -0.010 | | | 0.046 * |
| Corruption control | | 0.090 | | -0.960 ** |
| Partial autocracy | | -0.659 | | 0.137 |
| Partial democracy | | -1.402 | | -2.126 |
| Partial democracy, factions | | 0.087 | | 1.930 |
| Freedom | | -0.105 | | -0.041 |
| Government spending | | 0.024 | | 0.103 * |
| Physical integrity | | -0.312 * | | -0.228 |
| Communication | | | 0.026 | 0.055 * |
| Urban | | | -0.019 | -0.166 *** |
| Infant mortality | | | -0.017 | -0.118 *** |
| Youth bulge | | | -0.091 | -0.507 ** |
| Education | | | -0.048 | 0.319 |
| Population | 0.067 *** | 0.057 ** | 0.064 *** | 0.022 |
| Year | 0.282 *** | 0.265 *** | 0.153 ** | 0.054 |
| Constant | -565.783 *** | -528.737 *** | -302.082 ** | -84.885 |
| Observations | 367 | 386 | 419 | 339 |
| R-squared | 0.132 | 0.137 | 0.132 | 0.202 |
| F-test economic | 3.35 ** | | | 2.12 |
| F-test political | | 4.08 *** | | 3.90 *** |
| F-test social | | | 0.96 | 4.69 *** |

Notes: The coefficients are unstandardized. Standard errors are robust and allow for correlation between residuals within a single country.

*, **, and *** indicate that the coefficients are significant at the 10%, 5%, and 1% levels, respectively, in two-tailed tests of the null hypothesis $H_0: \beta = 0$.

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Table 2: Determinants of protests and demands 1990 to 2011, fixed-effects regressions

| Variable | Economic | Political | Social | All variables | Prior to 2011 |
|-----------------------------|-----------|------------|------------|---------------|---------------|
| GDP per capita | -0.026 | | | -0.091 | 0.010 |
| GDPPC growth | -0.017 | | | -0.007 | -0.011 |
| Inflation | 0.050 ** | | | 0.029 ** | 0.008 ** |
| Openness | -0.030 | | | -0.043 | -0.001 |
| Youth UR | 0.031 | | | 0.136 | 0.011 |
| Corruption control | | -2.419 ** | | -0.874 | -0.030 |
| Partial autocracy | | -0.882 | | -0.059 | 0.081 |
| Partial democracy | | -2.131 * | | -1.143 | -0.067 |
| Partial democracy, factions | | 3.036 *** | | 3.120 *** | 1.735 *** |
| Freedom | | -0.411 *** | | -0.451 *** | 0.010 |
| Government spending | | -0.006 | | 0.020 | 0.024 |
| Physical integrity | | -0.175 | | -0.154 | -0.026 |
| Communication | | | 0.074 ** | 0.090 ** | 0.001 |
| Urban | | | -0.172 | 0.007 | -0.066 ** |
| Infant mortality | | | -0.132 | -0.063 | 0.008 |
| Youth bulge | | | -0.638 *** | -0.507 ** | -0.038 |
| Education | | | 0.079 | 0.116 | 0.071 * |
| Population | 0.797 *** | 0.614 ** | 0.668 ** | 0.836 * | 0.180 *** |
| Year | 0.093 | 0.024 | -0.224 | -0.276 | 0.026 |
| Observations | 367 | 386 | 419 | 339 | 320 |
| R-squared (within) | 0.153 | 0.174 | 0.210 | 0.230 | 0.235 |
| F-test economic | 2.62 * | | | 1.83 | 1.22 |
| F-test political | | 6.55 *** | | 10.00 *** | 91.13 *** |
| F-test social | | | 3.66 ** | 2.39 * | 3.25 ** |

Notes: The coefficients are unstandardized. Standard errors are robust and allow for correlation between residuals within a single country.

*, **, and *** indicate that the coefficients are significant at the 10%, 5%, and 1% levels, respectively, in two-tailed tests of the null hypothesis $H_0: \beta = 0$.

Table 3: Determinants of protests, demands, and violence, 1990 to 2011, fixed-effect regressions

| Variable | Economic | Political | Social | All variables | Prior to 2011 |
|-----------------------------|-----------|-----------|-----------|---------------|---------------|
| GDP per capita | -0.048 | | | -0.172 | 0.017 |
| GDPPC growth | -0.065 | | | -0.003 | -0.016 |
| Inflation | 0.101 ** | | | 0.075 | 0.046 |
| Openness | -0.031 | | | -0.045 | -0.002 |
| Youth UR | 0.090 | | | 0.309 | 0.028 |
| Corruption control | | -4.234 * | | -0.994 | 0.122 |
| Partial autocracy | | -2.788 | | -0.136 | 0.106 |
| Partial democracy | | -4.794 * | | -2.956 | -0.271 |
| Partial democracy, factions | | 7.613 *** | | 5.922 | 7.148 *** |
| Freedom | | -0.309 | | -0.540 | 0.176 |
| Government spending | | 0.016 | | 0.038 | 0.073 |
| Physical integrity | | -0.358 | | -0.384 | -0.130 ** |
| Communication | | | 0.126 ** | 0.163 ** | -0.002 |
| Urban | | | -0.624 | -0.214 | -0.290 * |
| Infant mortality | | | -0.065 | -0.057 | 0.108 |
| Youth bulge | | | -1.319 ** | -1.107 ** | -0.136 |
| Education | | | 0.280 | 0.594 | 0.068 |
| Population | 1.589 *** | 1.375 *** | 1.666 *** | 1.718 ** | 0.802 *** |
| Year | 0.243 | 0.145 | -0.114 | -0.339 | 0.226 |
| Observations | 367 | 386 | 419 | 339 | 320 |
| R-squared (within) | 0.191 | 0.230 | 0.281 | 0.269 | 0.363 |
| F-test economic | 1.93 | | | 1.55 | 1.08 |
| F-test political | | 13.13 *** | | 2.08 * | 145.74 *** |
| F-test social | | | 2.85 ** | 1.92 | 1.36 |

Notes: The coefficients are unstandardized. Standard errors are robust and allow for correlation between residuals within a single country.

*, **, and *** indicate that the coefficients are significant at the 10%, 5%, and 1% levels, respectively, in two-tailed tests of the null hypothesis $H_0: \beta = 0$.

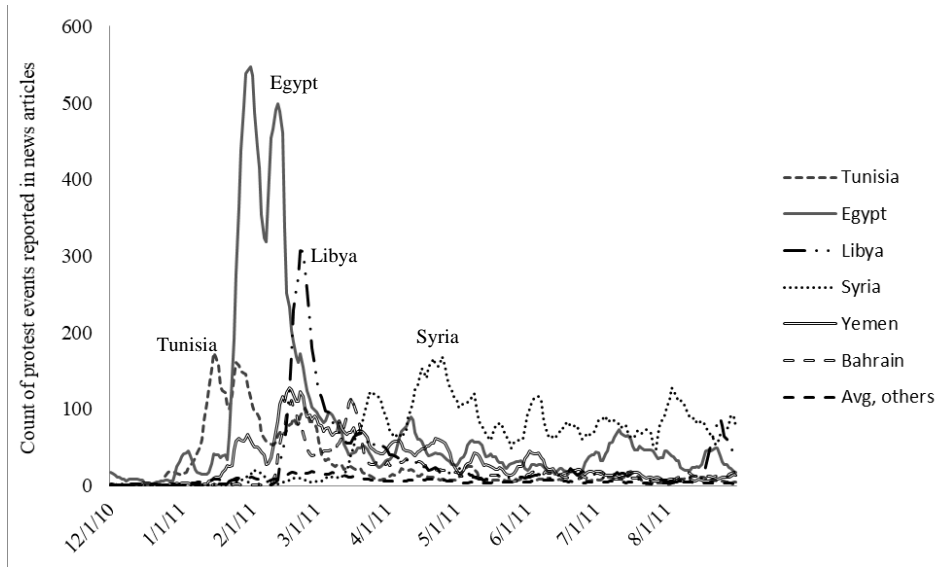
Table 4: Alternative models of protests and demands, 1990 to 2011, fixed-effect regressions

| Variable | Interaction effects | Structural shift | Transmission |
|-----------------------------------|---------------------|------------------|--------------|
| GDP per capita | -0.074 | -0.024 | -0.008 |
| GDPPC growth | 0.001 | -0.008 | -0.012 |
| Inflation | 0.026 * | 0.052 ** | 0.050 ** |
| Openness | -0.043 | -0.012 | -0.013 |
| Youth UR | -1.405 | 0.075 | 0.080 |
| Corruption control | -0.915 | -1.085 | -1.326 |
| Partial autocracy | 0.062 | 0.822 | 0.813 |
| Partial democracy | -2.895 * | -3.025 | -1.875 |
| Partial democracy, factions | 3.029 *** | -1.632 | -0.654 |
| Freedom | -0.532 ** | -0.311 | -0.355 *** |
| Government spending | 0.011 | -0.017 | 0.001 |
| Physical integrity | -0.103 | -0.191 | -0.179 |
| Communication | 0.091 * | -0.020 | 0.007 |
| Urban | 0.072 | -0.237 | -0.184 |
| Infant mortality | -0.112 | -0.010 | -0.019 |
| Youth bulge | -2.907 * | -0.221 | -0.282 * |
| Education | -5.116 | 0.966 | 0.812 |
| Population | 0.777 * | 0.675 *** | 0.728 * |
| Year | -0.313 | -0.112 | -0.022 |
| Year 2011 | | 14.251 *** | |
| Youth bulge*Education | 0.292 * | | |
| Youth bulge*Youth UR | 0.084 | | |
| Youth UR * Education | 0.170 | | |
| Youth bulge*UR*Education | -0.010 | | |
| Other country protests | | | -0.111 |
| Year 2011* Other country protests | | | 0.142 ** |
| Observations | 339 | 339 | 339 |
| R-squared (within) | 0.236 | 0.453 | 0.406 |
| F-test interaction terms | 1.16 | | |

Notes: The coefficients are unstandardized. Standard errors are robust and allow for correlation between residuals within a single country.

*, **, and *** indicate that the coefficients are significant at the 10%, 5%, and 1% levels, respectively, in two-tailed tests of the null hypothesis $H_0: \beta = 0$.

Figure 1. Protests and demands, 7-day moving average count of events

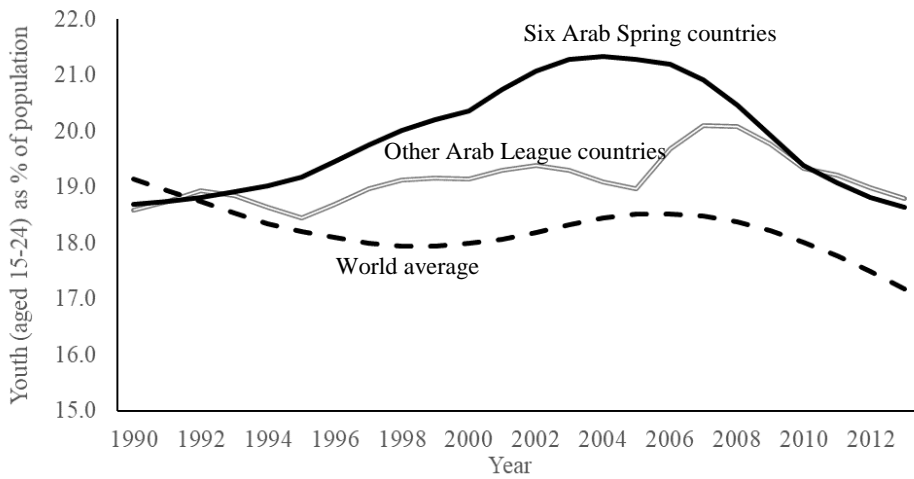


Commented [RK20]: Please address this comment.

Commented [RK21]: In your comment to my earlier query here, you said the no. of protest events differs from the no. of articles. Please check if the text is clear on that; there I got the impression that the unit of analysis was the article, not the event.

Commented [CM22R21]: We tried to clarify this in the paper. We changed the wording in the second page of the introduction and slightly altered the wording in the first paragraph of the Data and Statistical Model section.

Figure 2: Youth Bulge in 19 Arab League countries, 1990-2012



Note: Tunisia, Egypt, Libya, Syria, Bahrain, and Yemen are the six Arab Spring countries in this figure.

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