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FISCAL EXPENDITURE IN THE SELECTED COUNTRIES OF TUNISIA, EGYPT, JORDAN, AND SAUDI ARABIA IN RESPONSE TO THE ARAB SPRING : A STRUCTURAL BREAK APPROACH

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by

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RESEARCH PAPER APPROVAL

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MAJOR PROFESSOR: Dr. Mahbub Morshed

I use the Zivot Andrews Test and Chow Test to determine if the Arab Spring had any effect on the fiscal expenditure of the selected countries of Tunisia, Egypt, Jordan, and Saudi Arabia. The findings suggest that the Arab Spring played a pivotal role in increasing the fiscal expenditure of Tunisia and a partial role in Saudi Arabia. Egypt and Jordan experienced protests but did not experience fiscal reinvigoration of the public sectors or services. The findings bring to light the political and fiscal dynamics and limitations of the Arab Spring.

ACKNOWLEDGMENTS

I would like to thank Professor Morshed for guiding me through the research and supplying me with crucial data for which this research would not have been possible. In addition, I would like to thank Abdul Khan for taking time out of his day to help me run econometric formulas when he could.

DEDICATION

This work is dedicated to my family for being my side and helping me with this program. I especially want to thank my mom and dad for supporting me thoroughly in this endeavor.

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CHAPTER 1

INTRODUCTION

The aftermath of the Arab Spring has brought with it a plethora of literature. Much of the research focuses on the causal nature of the revolts. Others focus on the implications the Arab Spring has on foreign policy and why some revolts succeeded, and others failed. The economic aspects of the Arab Spring have been investigated less so than the political dimensions. Nonetheless, the economic dimensions of the Arab Spring are significant.

In the text that follows I will adventure into the economic aspects of the Arab Spring. Specifically, I will look at the how the Arab Spring effected the fiscal operations of the selected Arab countries of Tunisia, Egypt, Jordan, and Saudi Arabia. The motivation for this effort is that much of the growth in the Middle East is external: the Middle East is consistently one of the highest recipients of foreign aid, it relies heavily on oil revenue, and when oil revenue does not profit it directly, as in the case of oil-importing countries, remittances fill its place. In the wake of the Arab Spring, renowned economists Adeel Malik and Bassem Awadallah wrote in a much-cited paper that "the state centered development paradigm rests on the uninterrupted flow of external windfalls" (Malik and Awadallah 2011). Therefore, I will briefly document the events of the Arab Spring and the collapse of this source of external growth. Next I will review the literature regarding the intra-governmental fiscal policies of Arab countries in accordance to the redistributive model. Lastly, I will run the Zivot Andrews Test and Chow Test with data collected from the International Monetary Fund and other reliable sources to determine if the Arab Spring had any effect on the fiscal expenditures of the selected Arab countries.

It is said that the end of the Cold War and the lifting of the Iron Curtain marked "an end of history." The Middle East had experienced little mobility in economic openness or

transformation of governance since the fall of the Iron Curtain. Certainly no one has argued that there has been any structural changes or broken walls, both abstract and otherwise, during 1989 or the turn of the century with regard to the Middle East. Nonetheless, the world was shocked at the magnitude and audacity of the protesters first in Tunisia, then the wider MENA region.

The Arab Spring protests were sparked after the self-immolation of a street vendor Mohammed Bouazizi on December 17, 2010. Bouazizi's cart was confiscated by police for not having a permit to sell his goods in the marketplace. Soon after, the protests started. At first the protests were uncoordinated but increasing in volume. Less than a month after the self-immolation of Mohammed Bouazizi, Ben-Ali, Tunisia's dictator had resigned and fled the country and mass protests had begun in Tahrir Square in Cairo. By the end of 2011, every country in the MENA, with the exception of some of the Gulf countries, had experienced mass protests with many protests turning into civil wars and others into governmental transition or economic concessions.

The main grievances of the protesters were economic. In polls conducted in 2011, Egyptians, Tunisians, and Jordanians said that their focus was the economy when asked what the main challenge to their country is (Teti 2016). Indeed, by some estimates the youth unemployment rate in the MENA countries is the highest in the world (Islam, Dalal, and Federica 2022). This can be traced to the MENA region's rising population rates. The MENA countries' populations grew at a remarkable rate from 1950 through 1970 having the highest fertility rates in the world at "seven children per woman" (Yousef 2004). This, in turn, put considerable pressures on the economy to somehow adopt mechanisms to integrate the expanding labor force. The labor force in the MENA has grown from 3.4% per year in the 1980's to 3.6% per year in the 1990s before coming back down to 3.4% per year from 2000-2010

(Yousef 2004). This easily puts it as the top growing labor force in any developing region of the world (Yousef 2004). Studies have shown that in order for the MENA countries to keep unemployment rate from getting any worse, some 47 million new jobs would need to be created between 2002 and 2012 (Abed and Davoodi 2003).

Due to a free public education, the regional population was not only young but highly educated. Out of 20 of the countries with the largest increase in education between 1980 through 2010, 8 of them were Arab countries (Assad 2014). However, this increase in education has led, ironically, to an increase in unemployment in the MENA region with a 15% unemployment rate of those with above secondary education in the countries of Egypt, Jordan, and Tunisia (Ahmed, Domonique, and Furceri 2012). Compounding this problem are the fiscal constraints of the MENA countries' economies. The public sector has become overburdened with the new labor supply and is not only leaving out a large swath of the population from public employment but reducing the number of public jobs available for educated persons in the countries of Algeria, Jordan, Egypt, and Tunisia (Assad and Barsoum 2019). Specifically, educated new entrants into the public labor force, within the countries of Egypt and Tunisia, fell from 75-80% in the 1970's to 25-35% in the 2010s (Assad and Barsoum 2019). This development in education could not have been possible without oil revenue (Canpante and Chor 2012)

Oil is the driving force of the regional economy in the MENA and forms the basis of the economic decisions that permeate the region. At the end of World War II a famous State Department policy paper referred to oil in the Middle East as a "stupendous source of strategic power, and one of the greatest material prizes in world history…"(Chomsky 1991). The Persian Gulf and with it the wider Arab Gulf region became a center piece of foreign policy in global competition. Arab countries have leveraged oil as a weapon of foreign policy and as a means for

state building. The GCC countries account for over 25% of the world's proven oil reserves and have had spillover effects of this revenue in the wider region (Mirzoev et al. 2020). The spillover effects came in many forms.

The oil revenue from the GCC has had large benefits to the region. Since 1970, the GCC have extended a total amount of $147 billion in low interest loans and credits, 95% of which has been directed to Arab countries (Espinoza, Fayad, and Prasad 2013). In addition, the GCC accounts for more than 15% of exports for Jordan and Lebanon and 10% for Yemen and Egypt (Espinoza, Fayad, and Prasad 2013). Lastly, foreign aid has helped develop the broader region. Since 1962 the Arab development fund, which is a mix of state-owned funds throughout the GCC have contributed to $104 billion in direct sector specific development aid, 61% of this aid was earmarked to Arab countries (Espinoza, Fayad, and Prasad 2013). The main sector targeted for development in the region is transportation and communication, this could be due to the fact that there was a concerted effort during this time by western countries to push through a successful regional trade agreement such as that undertaken by the European Union at the turn of the 21st century (Espinoza, Fayad, and Prasad 2013).

Foreign aid is pervasive in the MENA region (see Fig 1.). In fact, the MENA region received the most development assistance per capita in 2008 (Malik and Awadallah 2011). This is doubly impressive given the drop in world GDP due to the financial crisis of 2007. The lesson to be learned is that aid donors make their contributions based not on their own income or availability of funds but based on rules of interest. Indeed, Jane Harrigan notes that it is "donor interest" that plays the most significant role in determining aid allocation in the MENA, especially in the case of where that aid is distributed on a bilateral basis (Harrigan 2011). This is not to say that western aid or donor aid was purposefully used to induce the Arab Spring, rather it

is to say that the economies of the MENA countries have become increasingly used to generous aid and that this could be leveraged as a western political instrument.

Aid (or official development assistance (ODA)) is defined by the OECD as loans and credits that exclude military purpose and which 25% is non-refundable (Challand 2014). This definition is crucial to the understanding of aid. Aid is not an altruistic or generous action of help but, as expressed before, takes into consideration "interest." As such net aid is defined as the amount of aid that must be paid back after the 25% non-refundable portion is accounted for. Benoit Challand notes that net ODA aid to Egypt in the run up to the Tahrir Square protests declined from $1.7 billion in 2007 to $0.4 billion in 2011 as compared to the steady amount of aid it had received on average in previous periods (Challand 2014). In the 1980's when the effects of low oil revenue were being felt profoundly the MENA agreed to Structural Adjustment Loans. It has been calculated that of the MENA countries that withdrew loans under the IMF's Structural Adjustment Loans program 30-64% of their export earnings went to pay off external debt under their loan obligations (Challand 2014).

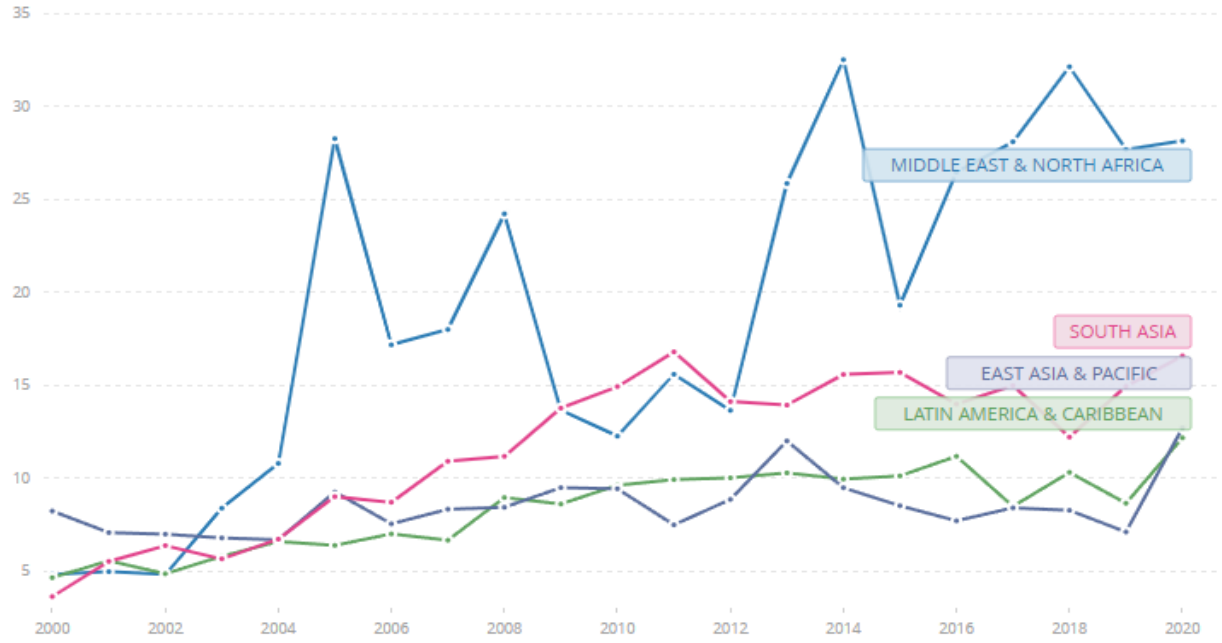

Fig 1. The World Bank. 2024. "Net official development assistance received (current US$)- Middle East & North Africa, Latin America & Caribbean, East Asia &Pacific, South Asia." World Bank Indicators. Accessed 25 March 2024. https://data.worldbank.org/indicator/DT.ODA.ODAT.CD?locations=ZQ-ZJ-Z4-8S&start=2000&end=2020&view=chart

Remittances played a notable role in the regional economics of the MENA. It is estimated that Middle East remittances "exceed the value of regional trade in goods" and official capital flows (Thiollet 2011). The discovery of oil in the Gulf countries created a dichotomy: resource rich countries were labor poor. As such, a marriage of sorts emerged where labor rich regional Arab countries exported labor and were rewarded with higher wages in their home countries as well as a stronger exchange rates from remittances sent back home. Remittances to labor exporting countries from the Gulf states are estimated at about $27 billion each year during the oil booms (Kapiszweski 2006). In the 1990's, remittances are estimated to provide from 12.4%

to 22.4% of the home countries GDP (Kapiszweski 2006). These estimates are on the lower bound due to the fact that migration to the Gulf fluctuated and the proportion of Arabs migrating to the GCC countries declined from the 1980's onwards (Thiollet 2011).

The collapse of remittances as a form of external revenue for some labor importing Arab countries is due to political causes. At the height of the migratory period, which is inextricably interlinked with oil revenue, some 7 million migrants were located in the Arabian Gulf, 5 million of which are estimated to be workers (Thiollet 2011). Many of the workers came from Egypt, Yemen, Jordan, Syria, Iraq and displaced Palestinians (Thiollet 2011). However, given the deep political seismic shifts in the region, the Arab Gulf countries began to view these migrants as a liability to their national well-being. An example of this is during the First Gulf War when Saddham Hussein invaded Kuwait. The governments of the PLO, Jordan, and Yemen supported Saddham Hussein's invasion of the Gulf state and the GCC countries responded by expelling some 2 million Arab workers from the region that were nationals of the supporting parties (Thiollet 2011). However, the demand for labor in the oil exporting GCC countries was of vital importance to the regional and global economy. The Gulf countries resided on a solution: phase out Arab labor with Asian labor (Thiollet 2011). In 1975, 72% of the Gulf migrants were Arab, by 2010 that number had dropped to 30% (Hertog and Luciani 2017, p.221). With the decrease in Arab migrants to the region, the benefits of the remittances to those labor exporting countries decreased with some countries being more negatively impacted than others (Miniaoui 2020).

CHAPTER 2

LITERATURE REVIEW

The Middle East growth model is a subject of much interest. Given that the modern Middle East institutions and countries were concocted after World War II the model of choice to be investigated is the "statist" model of development. I will describe this model within the context of the Middle East and its distinguishing features. Next, I will describe the effects of this model and how it impacted the economics, population and politics of the Middle East. Lastly, I will discuss literature that connects the development model and its characteristics to the Arab Spring.

The modern Middle East was born in the aftermath of World War II. Within this context the political-economic ideology of many developing regions, especially the Middle East, was born. This post-war model is called the interventionist-redistributive economic developmental model by some authors (Yousef 2004). The model is characterized by a number of factors: nation building, protection from outside influence, and oil production (Yousef 2004). While this model was the primary model of growth to different degrees throughout much of the world given the scale of destruction during World War II, it differs in the Middle East with regard to its magnitude as Tarik M. Yousef puts it, "state regulation of the economy and in the extent to which social policies became the vehicle for implementing redistributive programs" (Yousef 2004).

The beneficial outcomes of the model were undeniable. Between 1960 and 1985 the Middle East and North Africa had an average growth rate higher than Latin America and the Caribbean but lower than East Asia (Yousef 2004). In addition, poverty remained the lowest out of the developmental regions, with 5.6% of the Middle East and North Africa populations living in absolute poverty compared to East Asia and Latin America that had an absolute poverty rate of

14.7% and 28.8% respectively (Yousef 2004). Social quality indicators moved in a positive direction as a result of these redistributive policies: infant mortality decreased, life expectancy increased, literacy levels increased, and the population grew (Yousef 2004).

Subsidies are fundamental to the interventionist redistributive model of the MENA region. According to the IMF the MENA countries energy subsidies amounted to 48% of the world's entire energy subsidies in the year of 2011 (Sdralevhich et al. 2014). The subsidies made available in the region include energy and food staples. The most prevalent type of subsidy in the region is the pretax subsidy. The pretax subsidy of fuel is such that prices are set at artificially low prices in the domestic market, then company distributors are usually imbursed by the state through fiscal operations when taxes are declared for the difference between the market price and the price the service is sold (Sdralevich et al. 2014). Post tax subsidies are defined as a tax rate lower rate than the "desired tax" (Sdralevich et al. 2014). In 2012, subsidies on diesel and gasoline cost about 3% of GDP in the countries of the MENA within the context that MENA countries pay the lowest petroleum prices on average than any other region of the world (Sdralevich et al. 2014).

The model also relied heavily on public employment. The Arab national governments of the time had tried to guarantee work to all nationals, in line with pan-Arab socialism ideology. As such, the MENA is said to have arguably the largest public sector in the world (Assad and Barsoum 2019). Average share of public sector jobs in total employment in the 21st century was as high as 25% in Egypt, 40% in Jordan and 38% in Saudi Arabia (Assad and Barsoum 2019). In other GCC countries the public sector can be twice as high (Assad and Barsoum 2019). For a summary see Fig. 2.

	General Government Employment		Public Sector Employment	
	Percent of total employment	Percent of nonagricultural employment	Percent of total employment	Percent of nonagricultural employment
Algeria	25.7	32.0	31.3	39.0
Egypt	28.2	56.6	34.9	70.3
Iran, I.R. of	..	…	28.4	36.6
Jordan	33.9	39.5	36.1	42.1
Morocco	8.5	18.6	9.5	20.7
Pakistan	8.4	15.0	9.6	17.1
Tunisia	14.9	19.1	21.9	28.2
MENA7			20.0	33.1

Fig. 2. Gardner Edward. 2003. “Government and Public Sector Employment 1996-2000.” IMF. https://www.imf.org/external/pubs/ft/med/2003/eng/gardner/

Unlike the developmental models of the other developing regions of the world, the Middle East relied heavily on oil. Therefore, the economy of the region became highly volatile starting in the 1980’s when oil prices fell. The naked truth of the Middle Eastern economy was exposed for the first time since the production of oil in the region first started: the Middle East is extremely reliant on rents from oil, foreign aid and remittances (Malik and Awadallah 2011). The ensuing economic fallout inspired reforms in the form of the Washington Consensus. Firms were privatized and taxes were lowered. Nonetheless a review of the implementation of these policies in the Middle East and North Africa found “the pace of reforms have been slower in MENA than other regions.” (Dasgupta, Keller, and Srinivasan 2001). As a result, the other developing regions, which included East Asia and Latin America, have pushed farther ahead (Dasgupta, Keller, and Srinivasan 2001).

The MENA region continued to fall behind as globalization ensued after the fall of the Soviet Union. In virtually every category of economic development, the MENA region has fallen behind its developing competitors. The governance indicators of political stability, adherence to

the rule of law and control of corruption, among other indicators, have remained the lowest when compared to the East Asia and the Latin America and Caribbean regions (Abed and Davoodi 2003). This has led to portfolio investment in the MENA becoming "virtually nonexistent" (Abed and Davoodi 2003). Strikingly, the oil exporting countries have done comparatively worse than the non-oil exporting countries in integrating into the global economy (see Fig 3).

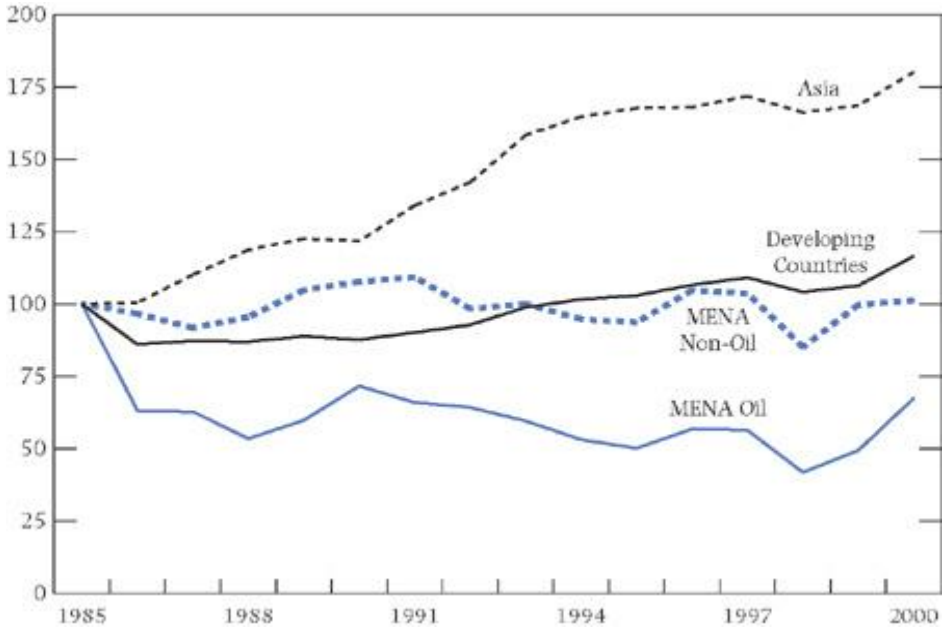

Fig.3. Abed George and Davoodi Hamid. 2003 "Export shares of each region starting in 1985" (Export Share Indices 1985=100).

https://www.imf.org/external/pubs/ft/med/2003/eng/abed.htm

On the eve of the Arab Spring, the economic model of the MENA was a failing experiment. The subsidies to help tackle poverty are woefully mismanaged and inefficient. In addition to having the highest youth unemployment rate in the world, the youth were incredibly educated leading to an extremely restless populace (Campante and Chor 2012). The stage was set for a revolution to take place; however, the signs were missed by virtually all academics and pundits.

CHAPTER 3

DATA SECTION

The chosen countries of Jordan, Tunisia, Egypt, and Saudi Arabia are the focus of this study. They are chosen for the fact that they all experienced the Arab Spring, to different degrees, and due to the data available. Many countries did not survive the transformation of the Arab Spring. Countries like Libya, Syria, and Yemen became failed states from the ensuing civil war that was brought on it by entrenched dictators. The rest of the Arab countries/territories, Morocco, Algeria, Palestine, and the GCC, with the exception of Saudi Arabia, are not included. Morocco and Algeria did not experience any significant unrest. In addition, Morocco does not prescribe to the model under consideration. Out of the GCC countries, Bahrain was the one country that invoked a significant reaction against their respective government. However, the protests were quickly crushed. Saudi Arabia experienced the largest protest in its modern history. In addition, it is a powerful actor and continues to influence the region. Therefore, its fiscal response is added as representative of the Gulf countries and its influence in the region.

The time frame for the study is from 2001-2020. The timeline goes to show 10 years of consistent fiscal operations before the start of the Arab Spring. As such, it gives a consistent history of patterns on how Arab governments reacted to the events around them: the wars in Afghanistan and Iraq, the globalization of the world economy, the Arab Spring and the regional economy before the beginning of the Covid-19 Pandemic. The focus of the study is divided on the Arab Spring: the events preceding the Arab Spring and effect this had on fiscal operations in the respective Arab countries.

The data for this research has been extracted from a number of sources. The International Monetary Fund (IMF) and the United Nations Economic and Social Commission for Western

Asia (UNESCWA) form the basis of the information. I combined the functional expenditures and statement of operations accounts of the respective countries in terms of percent of GDP to ascertain how fiscal expenditure has been appropriated across the given sectors over 2001-2020. The Arab countries are notoriously secretive of their accounts (Frank, Garg, and Renteria 2023). Data from UNESCWA focuses overwhelmingly on data after 2011. The IMF has only limited information on the spending policies of the countries under consideration, I fill in the gaps using UNESCWA data. I also utilized IMF Staff Reports. Data from IMF Staff Reports form the bulk Tunisia's social protection column and Saudi Arabia's revenue and expenditure columns. Jordan's entire table under the timeline being considered was imported from the IMF and didn't require external sources to fill in the data. Egypt's data was forthcoming on all aspects of its budget I wish to consider limited to 2015- after which I relied on UNESCWA data. Saudi Arabia's functional expenditure data was taken from its national website. Missing data on defense spending is replaced with data from the Stockholm International Peace Research Institute.

The data table is in formation of the IMF template. All data is set as a percent of GDP. I combine the data table information on revenue and expenses without their subcomponents and then attach them to the broader sectors of government functional expenditures such as public order and safety, environmental protection, housing community and amenities, health, education, and social protection. It is important to note that subsidies are an inherent part of the interventionist-redistributive model; they are included in the social protection section of the template.

It would be prudent to further define government expense components given that they are broad and may appear contradictory. Social protection includes, largely, subsidies on fuel, food,

electricity, and unemployment benefits and other minor components (Social Expenditure Monitor 2022). Housing community and amenities include infrastructure support for communities such as street lighting, public transportation, and quality water supply services (Social Expenditure Monitor 2022).

Fig. 4

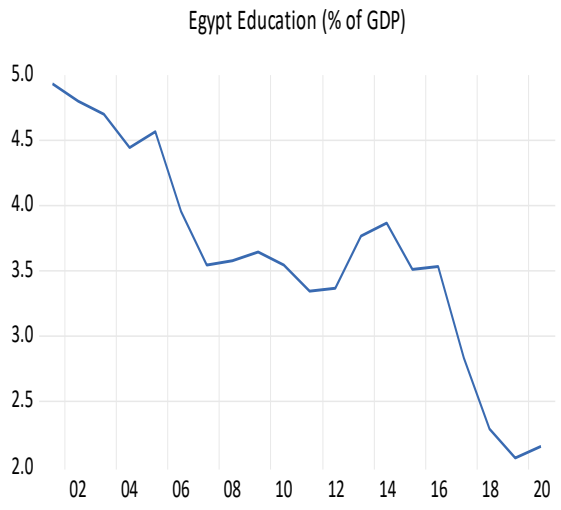

Fig. 5

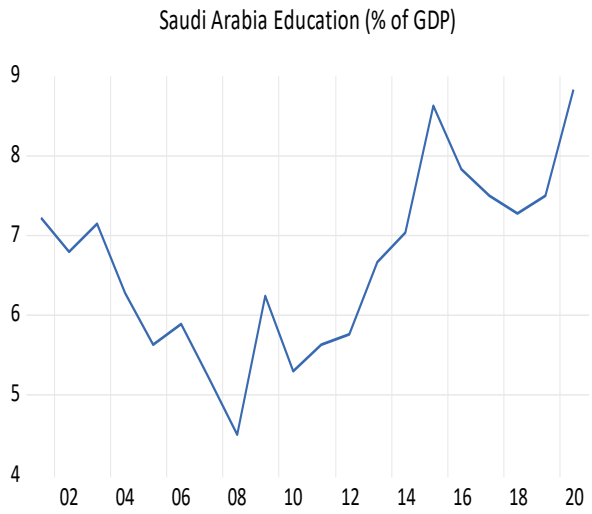

Fig. 6

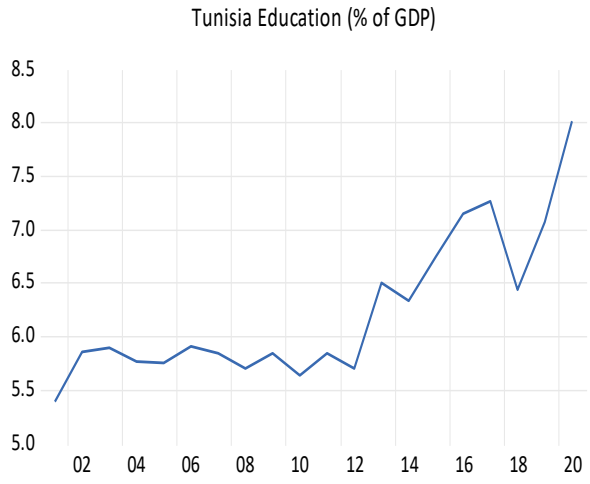

Fig. 7

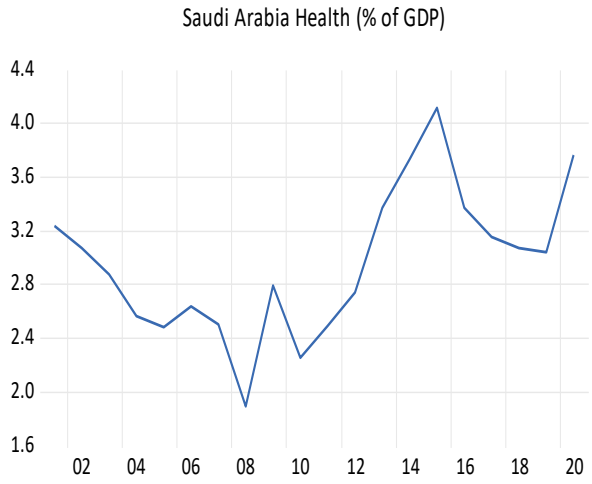

Fig. 4-6 demonstrate, graphically, the expenditure trajectory of some of the social sectors from 2001-2020. Egypt has a decreasing investment in education over time. Tunisia and Saudi Arabia, on the other hand, have increased expenditure in their respective social sector(s). The figures show that sectoral government expenditures have changed significantly after the Arab Spring in these countries.

CHAPTER 4

METHODOLOGY

I utilize a structural endogenous break and exogenous break test on the data to ascertain if government fiscal expenditure has changed as a result of the Arab Spring. The Arab Spring was a cascade effect starting in Tunisia in December of 2010. The protests hit the streets in different countries afterwards with various results within the year 2011 onwards. In all four of the selected countries, I will test whether social expenditures up to 2010 changed after, and including, 2011.

I will use the Zivot Andrews endogenous test to test for a structural break within the data itself. The four countries analyzed in the sample differ widely in their economies and all have had different results from the impact of the Arab Spring. The endogenous test will ascertain which, if any, fiscal sectors were changed as a result of the Arab Spring given the data. It is important to note that there are several ways to run the Zivot Andrews test. I have decided to run the Zivot Andrews Test using both a trend and intercept break. This means that the structural breaks that are found must be more permanent in nature than simply a marginal increase, or decrease, in functional government expenditure to placate protesters, as has been the case in many of the MENA countries (Sralevich et al. 2014). Therefore, the results presented will be more robust than simply a trending structural break.

For the exogenous break, I use the Chow Test in the selected social sectors of education and health for which data is available. The Chow Test is different than the Zivot Andrews test in that it requires the analyst to specify the date, or time, of the break. For this analysis, the point of break will be set at 2010. The alternative hypothesis will be identified as a decreasing or increasing break in functional expenditure in the selected public sectors as described in the data section.

CHAPTER 5

RESULTS

Table 1: Zivot Andrews Test Significance Results

Year	Tunisia	Egypt	Jordan	Saudi Arabia
2001				
2002				
2003				
2004				
2005				
2006				
2007				
2008			X** X***	
2009			X***	X**
2010		X**		
2011	X*** X**			
2012			X***	
2013		X***		X***
2014		X***		
2015				
2016		X***		
2017				
2018				
2019				
2020				
Total Statistically Significant Structural Breaks	2	4	4	1

Table 1 Details: All structural breaks in Table 1 are significant at the 10% level if *, 5% level if **, 1% level if ***. Tunisia's fiscal expenditure structural breaks include Revenue (2011)** and Social Protection (2011)***. Egypt's fiscal expenditure structural breaks include Revenue (2010)**, Health (2013)***, Defense (2014)***, and Environmental Protection (2016)***.
-Jordan's fiscal expenditure structural breaks include Housing Communities and Amenities (2008)**, Education (2008)***, Social Protection (2009)***, and Health (2012)***. Saudi Arabia fiscal expenditure structural break include Expenses (2009)** and Housing Community and Amenities (2013)***.

I report Chow Test results for education expenditures of all four countries in our sample and health expenditures for Saudi Arabia, Egypt, and Jordan. It is evident from Table 2 that Saudi Arabia, Jordan, and Tunisia changed their government expenditure on education significantly after the Arab Spring in 2010. However, in terms of health expenditure, only Saudi Arabia yielded a structural break. Since increased inequality was one of the factors that fueled the revolt against the governments during the Arab Spring, we observe some efforts from the governments to respond to this by raising their expenditure on education and health.

Table 2: Chow Test Results

Saudi Arabia Education Chow Test Result
Chow Breakpoint Test: 2010
Null Hypothesis: No breaks at specified breakpoints
Varying regressors: All equation variables
Equation Sample: 2001 2020

F-statistic	13.13147	Prob. F(2,16)	0.0004
Log likelihood ratio	19.42644	Prob. Chi-Square(2)	0.0001
Wald Statistic	26.26295	Prob. Chi-Square(2)	0.0000

Egypt Education Chow Test Result
Chow Breakpoint Test: 2010
Null Hypothesis: No breaks at specified breakpoints
Varying regressors: All equation variables
Equation Sample: 2001 2020

F-statistic	2.071571	Prob. F(2,16)	0.1585
Log likelihood ratio	4.605503	Prob. Chi-Square(2)	0.1000
Wald Statistic	4.143141	Prob. Chi-Square(2)	0.1260

Jordan Education Chow Test Result
Chow Breakpoint Test: 2010
Null Hypothesis: No breaks at specified breakpoints
Varying regressors: All equation variables
Equation Sample: 2001 2020

F-statistic	3.886060	Prob. F(2,16)	0.0421
Log likelihood ratio	7.918495	Prob. Chi-Square(2)	0.0191
Wald Statistic	7.772120	Prob. Chi-Square(2)	0.0205

Tunisia Education Chow Test Result
Chow Breakpoint Test: 2010
Null Hypothesis: No breaks at specified breakpoints
Varying regressors: All equation variables
Equation Sample: 2001 2020

F-statistic	8.149249	Prob. F(2,16)	0.0036
Log likelihood ratio	14.04864	Prob. Chi-Square(2)	0.0009
Wald Statistic	16.29850	Prob. Chi-Square(2)	0.0003

Saudi Arabia Health Chow Test Result
Chow Breakpoint Test: 2010
Null Hypothesis: No breaks at specified breakpoints
Varying regressors: All equation variables
Equation Sample: 2001 2020

F-statistic	4.200352	Prob. F(2,16)	0.0342
Log likelihood ratio	8.440465	Prob. Chi-Square(2)	0.0147
Wald Statistic	8.400704	Prob. Chi-Square(2)	0.0150

Egypt Health Chow Test Result
Chow Breakpoint Test: 2010
Null Hypothesis: No breaks at specified breakpoints
Varying regressors: All equation variables
Equation Sample: 2001 2020

F-statistic	1.169992	Prob. F(2,16)	0.3356
Log likelihood ratio	2.729897	Prob. Chi-Square(2)	0.2554
Wald Statistic	2.339983	Prob. Chi-Square(2)	0.3104

Jordan Health Chow Test Result
Chow Breakpoint Test: 2010
Null Hypothesis: No breaks at specified breakpoints
Varying regressors: All equation variables
Equation Sample: 2001 2020

F-statistic	0.767003	Prob. F(2,16)	0.4807
Log likelihood ratio	1.831070	Prob. Chi-Square(2)	0.4003
Wald Statistic	1.534006	Prob. Chi-Square(2)	0.4644

Table 3: Tunisia Functional Expenditure (as a percentage of GDP): IMF(A) 2013; IMF (A1) 2021; Social Expenditure Monitor(a) 2022; SIRPI(a) 2024. Note: health calculated in 2013 is averaged based on author's calculations. Data on social protections after 2013 is estimated by the author from IMF(A1) 2021 Staff Report.

Year	Revenue	Expenses	Defense	Public Order and Safety	Environmental Protection	Housing & Community Amenitites	Health	Education	Social Protection
2001	21.81	19.75	1.52	2.26	0	1.48	1.76	5.39	0.4
2002	22.32	20.13	1.49	2.36	0	1.53	1.74	5.86	0.42
2003	21.52	19.66	1.48	2.28	0	1.4	1.67	5.9	0.43
2004	21.58	19.81	1.43	2.25	0.29	1.26	1.55	5.77	0.43
2005	21.27	20.13	1.45	2.18	0.33	0.99	1.51	5.75	0.54
2006	21.33	19.66	1.45	2.06	0.44	0.85	1.5	5.91	0.46
2007	21.7	19.88	1.26	2.01	0.34	0.92	1.4	5.85	0.47
2008	24	20.89	1.29	1.97	0.34	1.12	1.34	5.7	0.55
2009	22.96	21.26	1.3	2.04	0.38	1.4	1.41	5.84	0.55
2010	22.84	20.97	1.3	2.05	0.37	1.77	1.44	5.64	0.54
2011	24.89	26.64	1.56	2.51	0.34	1.42	1.52	5.84	1.98
2012	24.08	27.5	1.51	2.84	0.31	1.2	1.67	5.7	2.39
2013	23.6	29.62	1.6	N/A	N/A	N/A	1.7	6.5	1.8
2014	24	28.08	1.8	N/A	0.65	2.07	1.73	6.34	1.5
2015	22.4	26.61	2.1	N/A	0.73	2.22	1.93	6.75	1.65
2016	22.5	27.39	2.2	N/A	0.79	2.67	2	7.15	1.6
2017	24.3	28.96	2	N/A	0.78	3.39	1.95	7.27	1.95
2018	24.9	28.87	2	N/A	0.7	3.11	1.85	6.44	2.5
2019	27.5	29.18	2.4	N/A	0.73	2.74	1.95	7.07	2.75
2020	26.1	34.64	2.7	N/A	0.99	3.2	2.46	8.02	3.25

Table 3a: Tunisia averages of functional expenditure with (2001-2010) before the Arab Spring and (2011-2020) during or after the Arab Spring in percent of GDP.

Year	Expense	Defens	Public Order and Safet	Environmental Protectio	Housing & Community Amenitie	Healt	Educatio	Social Protectio
2001-2010	20.214	1.397	N/A	N/A	N/A	1.532	5.761	0.479
2011-2020	28.749	1.987	N/A	N/A	N/A	1.876	6.708	2.154444444
	INC	INC				INC	INC	INC

Table 4: Egypt Functional Expenditure (as percentage of GDP): IMF(B) 2016; Social Expenditure Monitor 2022; SIRPI (b) 2024.

Year	Revenue	Expenses	Defenses	Public Order and Safety	Environmental Protection	Housing&Community Amenitities	Health	Education	Social Protection
2001	19.71	21.43	2.58	1.46	0	1.31	1.18	4.93	0.2
2002	19.66	19.54	3.21	1.54	0.07	1.31	1.76	4.8	1.77
2003	20.31	19.67	3.04	1.58	0.2	1.29	1.73	4.7	1.82
2004	19.97	19.65	2.85	1.49	0.09	1.15	1.58	4.44	2.23
2005	19.58	20.19	2.61	1.57	0.09	1.06	1.28	4.56	2.64
2006	23.29	25.5	2.45	1.62	0.06	0.86	1.49	3.95	8.57
2007	23.01	22.88	2.29	1.42	0.11	1.18	1.33	3.54	6.96
2008	23.51	26.35	2.13	1.4	0.1	1.47	1.4	3.58	9.15
2009	25.78	28.11	2.06	1.48	0.11	1.66	1.44	3.64	10.78
2010	21.13	25.04	1.88	1.44	0.11	1.6	1.37	3.54	7.38
2011	18.4	25.11	1.85	1.44	0.08	0.89	1.41	3.34	7.9
2012	18.13	25.98	1.57	1.65	0.09	0.69	1.34	3.37	8.51
2013	18.83	29.47	1.57	1.89	0.09	0.94	2.2	3.77	8.4
2014	21.44	30.45	1.61	1.93	0.1	0.97	2.25	3.86	8.6
2015	19.04	27.48	1.46	1.76	0.09	0.88	2.05	3.51	7.81
2016	18.1	28.56	1.7	N/A	0.29	1.37	1.6	3.53	7.02
2017	19	28.23	1.4	N/A	0.22	2.49	1.34	2.84	7.57
2018	18.8	26.67	1.2	N/A	0.24	1.51	1.18	2.29	7.06
2019	17.7	24.48	1.2	N/A	0.2	1.2	1.1	2.07	5.14
2020	16.7	23.32	1.1	N/A	0.24	1.31	1.19	2.16	3.73

Table 4a: Egypt averages of functional expenditure with (2001-2010) before the Arab Spring and (2011-2020) during or after the Arab Spring in percent of GDP.

Year	Expense	Defense	Public Order and Safet	Environmental Protectio	Housing & Community Amenitie	Health	Education	Social Protection
2001-2010	22.836	2.51	N/A	0.094	1.289	1.456	4.168	5.15
2011-2020	26.975	1.466	N/A	0.164	1.225	1.566	3.074	7.174
	INC	DEC		INC	DEC	INC	DEC	INC

Table 5: Jordan Functional Expenditure (as a percentage of GDP): IMF(C) 2021.

Year	Revenue	Expenses	Defenses	Public Order and Safety	Environmental Protection	Housing &Community Amenitities	Health	Education	Social Protection
2001	27.75	26.17	5.41	2.8	0	0.56	3.26	4.96	5.17
2002	27.73	27.48	6.27	2.64	1.07	0.77	3.34	4.72	0.93
2003	31.72	28.57	6.94	2.84	1.17	0.79	3.3	4.77	0.77
2004	33.02	31.17	5.09	3.13	0.43	0.76	3.35	4.52	0.58
2005	33.29	34.57	4.68	3.13	0.07	0.27	3.14	4.92	12.59
2006	31.51	31.76	4.52	2.97	0.13	0.25	3.89	4.66	9.11
2007	31.75	32.86	6.06	3.19	0.04	0.3	2.59	5.04	10.15
2008	29.47	30.47	5.92	3.43	0.04	1.05	3.27	3.67	5.73
2009	25.95	29.31	5.72	3.99	0.03	1.67	4	3.59	6.31
2010	24.2	26.24	5.04	3.95	0.02	1.36	3.23	3.32	5.5
2011	25.83	28.85	4.69	4.03	0.09	1.2	3.23	3.65	8.59
2012	22.5	28.87	3.94	3.93	0.05	0.75	2.98	3.71	9.39
2013	23.54	26.24	3.47	3.76	0.26	1.14	2.92	3.86	6.66
2014	27.78	27.49	3.44	3.84	0.16	0.84	3.33	3.85	6.29
2015	24.81	25.71	3.42	3.81	0.16	0.87	3.2	3.8	5.49
2016	24.96	25.86	3.62	3.94	0.05	0.79	3.24	3.68	5.556
2017	25.26	25.68	3.88	4.06	0.06	0.87	2.71	3.47	5.89
2018	26.61	26.56	3.97	4.21	0.05	0.81	3.33	3.41	5.61
2019	24.54	26.25	3.89	4.34	0.09	0.5	3.18	3.43	5.46
2020	22.66	28.17	3.82	4.61	0.02	0.6	2.79	3.67	6.49

Table 5a: Jordan averages of functional expenditure with (2001-2010) before the Arab Spring and (2011-2020) during or after the Arab Spring as a percent of GDP.

Year	Expense	Defense	Public Order and Safet	Environmental Protectio	Housing & Community Amenities	Healt	Educatio	Social Protectio
2001-2010	29.86	5.565	3.207	0.3	0.778	3.337	4.417	5.684
2011-2020	26.968	3.814	4.053	0.099	0.837	3.091	3.653	6.5426
	DEC	DEC	INC	DEC	INC	DEC	DEC	INC

Table 6: Saudi Arabia Functional Expenditure (as a percentage of GDP): Morshed, Mahbub, email message to author, February 6, 2024. IMF(D) 2006; IMF(E) 2007; IMF(F) 2013; IMF(G) 2017; IMF(H) 2018; IMF(I) 2019; IMF(J) 2023. Note IMF reports D-J include the revenue and expenses of Saudi Arabia from 2001-2020.

Year	Revenue	Expenses	Defenses	Public Order and Safety	Housing Communities & Amenities	Health	Education	Social Protection
2001	33.2	37.2	7.486573704	5.025950565	1.494389393	3.236564	7.227057686	0.124544518
2002	30.1	36.1	6.842541683	5.253280789	1.239482855	3.072899	6.800208274	0.120390029
2003	34.5	33.3	6.397422891	4.46693909	1.300911058	2.879847	7.147967512	0.118871242
2004	38.1	30.1	6.046586408	4.361614086	1.084941198	2.56183	6.271984565	0.118522122
2005	48.6	30.2	5.195848781	4.539512224	0.992467323	2.478365	5.641098141	0.093356116
2006	48.1	27.3	5.328124657	4.456918252	1.02940791	2.641391	5.899647961	0.08870053
2007	41.2	29.5	5.142135721	4.420118461	1.006205307	2.507398	5.21411292	0.093980923
2008	56.5	26.7	5.014985343	3.275125972	0.959964868	1.889405	4.49837321	0.06674403
2009	31.7	37.1	5.321676613	4.197457514	0.903539054	2.788237	6.249576855	0.086444929
2010	37.5	34	4.847085337	3.581723949	0.925646387	2.259213	5.295394032	0.070022991
2011	44.44	21.9	4.271784105	3.657914026	0.9797608	2.489447	5.635710299	0.081004471
2012	45.2	22.2	4.369065011	3.427727921	0.944779239	2.744733	5.769584739	0.116308393
2013	41.3	35.5	4.214895603	3.961138987	1.415036892	3.374338	6.664638042	0.153575433
2014	36.8	40.2	5.984670944	4.290393902	1.499517155	3.731111	7.029196002	0.184077004
2015	25	32.2	6.506387578	5.218315623	1.552590735	4.118953	8.629099837	0.171835312
2016	21.5	30	5.236945573	4.739118192	1.249488838	3.372863	7.831932815	0.124953019
2017	24.1	28	4.959730028	4.440985719	1.186702641	3.156692	7.490481942	0.125474547
2018	30.9	30.4	4.869226725	4.284935193	1.134391624	3.068771	7.26886489	0.137255606
2019	29.5	28.3	4.803502406	4.410227373	1.09760722	3.041093	7.496295336	0.128585282
2020	28.4	33.4	5.952030494	5.193612139	1.398427261	3.761577	8.817796511	0.161708069

Table 6a: Averages of functional expenditure with (2001-2010) before the Arab Spring and (2011-2020) during or after the Arab Spring as a percent of GDP.

Year	Expense	Defense	Public Order and Safet	Housing Community & Amenitie	Healt	Educatio	Social Protectio
2001-2010	32.15	5.762298114	4.35786409	1.093695535	2.631515	5.890929274	0.098157743
2011-2020	30.21	5.116823847	4.362436907	1.245830241	3.285958	7.263360041	0.138477714
	DEC	DEC	INC	INC	INC	INC	INC

The results from the Zivot Andrews test vary. Tunisia witnessed the clearest example of fiscal change due to the Arab Spring protests. In the Tunisia experience, almost all the designated sectors of analysis were impacted: the public sector was reinvigorated as a result of the revolution. Jordan and Egypt, on the other hand, experienced almost no economic changes, as far as fiscal expenditure is concerned. Saudi Arabia experienced only one sectoral break after 2010

but given that the sector that was targeted was of significant impact to the Saudi populace, it can be inferred that this was a result of the Arab Spring uprisings. Given the unanimous insignificance of the Chow Test results in the social sectors of education and health it can be further inferred that the magnitude of the Arab Spring protests is spread out with each country reacting to population unrest rather than preempting it.

CHAPTER 6

CONCLUSION

Tunisia had the most direct fiscal change after the Arab Spring. Fiscal expenditure, after the overthrow of Ben Ali, has increased about every year since 2011. Expenditure on social protection almost quadrupled in 2011 from the previous year. It has since stayed at an elevated amount. Expenses in Tunisia have continued to climb, and revenue has increased, a sign that Tunisia is not utilizing austerity policies. In fact, the fiscal policies of Tunisia have shown remarkable persistence after the Arab Spring. The problem with Tunisia's fiscal policies is that they have become unsustainable. Since 2017, the tax revenues Tunisia collects have increased steadily but not enough to cover expenses (Diwan, Hachemi, and Hamza 2024).

Egypt, according to the Zivot Andrews Test and Chow Test, did not experience a significant change to its fiscal expenditure despite having a successful political revolution. This is a strange fact given that one usually proceeds after another. A reason why fiscal expenditure was not impacted by the success of the Arab Spring in Egypt could be due to the fiscal constraints on the country. Egypt is heavily indebted and has continued to hover on the edges of an economic crisis. A World Bank report on Egypt's finances, published in the context of the IMF's Standby Agreement with Egypt, stated that "Interest payments stand out as the single largest expenditure item, absorbing significant budget resources" (Youssef et al. 2022). The debt level is high because most of the debt is short term debt with high interest rates. In addition, Egypt is arguably the largest importer of wheat and has much of its food supplies imported. This led to foreign reserves dwindling forcing the Central Bank of Egypt to impose currency controls (Springborg and Luciani 2017, p.189). Therefore, Egypt has had to resort to fiscal constraint rather than fiscal splurge, as what happened in Tunisia.

Egypt's structural break results show a maneuvering of fiscal expenditure since the Arab Spring. Table 4a shows that, on average, expenses, environmental protection, health and social protection have all increased after the Arab Spring. Spending on defense, housing community and amenities, and education have all decreased. The subtle shift in government spending from social sectors to non-social sectors occurred after 2014. In 2014, President Abdel Fattah Al-Sisi took power in Egypt. Soon after he was "elected," he began restructuring the economy by increasing taxes and reducing subsidies (Springborg and Luciani 2018, p. 190). For example, in 2014, social sectors and non-social sectors each occupied an equal amount of the budget. By 2020, non-social sectors received 65.7% of the budget while social sectors received 34.3% of the budget (Youssef et al. 2022). Specifically, government expenditure on wages and energy subsidies has decreased and expenditure on debt interest payments has increased (Youssef et al. 2022). This could explain the structural break reduction in defense spending and health but does not explain the reduction in revenue, especially given the increase in taxes.

The decline of revenue in Egypt can be partially attributed to the Arab Spring. Since the Arab Spring, the GDP of Egypt's economy has splintered (Khan and Miller 2016, p.3). As such, the revenue accumulated by Egypt's government through taxes has also decreased. The two sectors driving Egypt's income, tourism and energy dependent industries, faltered (Springborg and Luciani 2018, p.200). The rise of ISIS in the Middle East and the Egyptian Sinai has been a sharp blow to Egypt's tourism (Springborg and Luciani 2018, p.201). The energy sector in Egypt has also contracted. Shortly after the 2011 revolution, gas supplies dried up in Egypt, negatively impacting all energy related sectors. One example of this was the fall in cement production by 30% due to the higher price of having to import gas (Springborg and Luciani 2018, p. 201). The continued reliance on foreign energy would be a stumbling block for the Egyptian economy.

According to the test results, Jordan experienced no statistically significant change to its functional expenditures as a result of the Arab Spring either. King Abdullah II adopted minor changes to the constitution and there was a modest increase in public wages and subsidies (labelled social protections in Table 5) (Barany 2012). The increase in subsidies and wages were temporary measures and simply reorganized current expenditures to placate the protests. In November of 2012, the Jordanian government ended the subsidies it had instituted when protests first broke out in January of 2011 as part of a previous agreement with the IMF (Beck and Huser 2015). As a response, protests were sparked again but then slowly simmered. Rather than outright placating the protesters by splurging, the King was able to move money from one sector of the economy to the other (The Associated Press, Aman 2012). This can be further demonstrated in the increasing and decreasing sector average expenditures in Table 5a.

The reason Jordan did not feel obligated to increase fiscal expenditure is due to the fact that Jordan still enjoys a high amount of external support. Jordan has been able to induce political rents in the form of loans and grants to absorb the most aid per capita from the U.S. and multilateral organizations than either Egypt or Tunisia (Beck and Huser 2015). According to Martin Beck and Simone Huser, Jordan has been able to leverage its geography, (Jordan is situated in between the Levant and the Gulf) and its close relationship to Israel to make it one of the most “robust authoritarian regimes in the region” (Beck and Huser 2015). In addition, Jordan, just before the Arab Spring, was highly dependent on remittances, with 13 % of its GDP in 2010 consisting of remittances (World Bank Indicators(a) 2024). It is in this sense that Jordan can be considered a rentier state.

Saudi Arabia’s results are partially surprising. Given that Saudi Arabia is a rentier state and relies mainly off the revenue of its oil, few would have thought that Saudi Arabia would

have had any response to the Arab Spring protests. The Kingdom of Saudi Arabia increased expenditure into most sectors of its functional expenditure portfolio. Given the methodological spread of time of these expenses, it seems that Saudi Arabia was adapting to the situation slowly. In 2013, expenses occupied 35% of Saudi Arabia's GDP compared to 22% in 2012. This sharp increase stems from the largest protest in Saudi Arabia's modern history (Matthiesen 2012).

Saudi Arabia's response to the Arab Spring originated from domestic turmoil regarding Shi'ites in the eastern parts of the country. The Shi'ites of Saudi Arabia number about 2.5 million or roughly 10% of the country and have a long history of being discriminated against by the formal institutions of Saudi Arabia (Wehrey 2013). For example, the Shi'a are forbidden from holding positions in the Ministry of Interior, the National Guard and Ministry of Defense (Wehrey 2013). In February 2011 and then again in late 2012 the Shi'a protestors followed the call of the Arab Spring, initially, demanding the release of high-profile political prisoners related to the Khobar Tower bombings of 1996. King Abdullah announced an economic package of around $130 billion which included, unemployment benefits, study abroad scholarships, and an inflation adjusted allowance for Saudi public servants (Wehrey 2013). However, the Shi'a are banned from these institutions, with the possible exception of the study abroad program (Matthiesen 2012). It seems that these concessions were aimed not for the Shi'a population but to preempt a widening of the protests into the Sunni population. By late 2012, "more than 299,000 Saudi men and women had been hired into public employment in the space of a year- a figure that was roughly equal to public-sector hiring for the entire previous decade" (Wehrey 2013).

The Zivot-Andrews Test results show, in Table 1, there was a large infusion of capital in the housing sector during 2013. This infusion of monies was due to one of the chief problems in Saudi society: the large deficit in the supply of housing (Alhajri 2022). However, Saudi Arabia's

investment in the housing sector did not stop there, as Table 6a shows, there was an increased amount of investments into the social sectors of social protection, education, and health after 2010. I believe a reason for this is due not only to the Arab Spring but also due to regional considerations such as the Joint Plan of Action that was signed between western powers and Iran in November 2013 to loosen financial sanctions in exchange for a limit on Iranian nuclear enrichment (Gearan and Warrick 2013). The aftermath of the Arab Spring in Saudi Arabia left the Shi'a population further alienated from Saudi society. As such the continued expenditure in the social sector can be thought of as seeking to consolidate Sunni support for the government rather than seeking reproachment with the Shi'a. Indeed, Sunni and Shi'a relations continued to deteriorate after the Arab Spring culminating in the Qatif protests of 2017.

In conclusion, the Arab Spring played a partial role in the fiscal reinvigoration of the public sector. The successful revolution in Tunisia, also known as the Jasmine Revolution, led to the reinvigoration of the interventionist redistributive model rather than the emancipation from it. The reliance of external forms of support, such as aid from the U.S. and multilateral organizations, have shielded the regime of Jordan from taking any substantive fiscal actions in the form of reinvigorating the public sector or at least reforming it to make it economically viable for the populace. In the case of Egypt, the political revolution had to face the fiscal reality of Egypt's economic position. Had Egypt enjoyed a more economically secure position, it would not have been hard to imagine that they would have followed in the fiscal footsteps of Tunisia. Saudi Arabia's enhanced investment in its public sectors, after 2010, should at least question the long-stated assumptions about regime stability of rentier theory.

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APPENDIX A
Zivot Andrews Test Results
Tunisia

Sector	Breakpoint	Significance
Revenue**	2011	t-Statistic Prob. * Zivot-Andrews test statistic -5.55915 0.047771 1% critical value: -5.57 5% critical value: -5.08 10% critical value: -4.82
Expenses	2011	t-Statistic Prob. * Zivot-Andrews test statistic -3.7796 0.020940 1% critical value: -5.57 5% critical value: -5.08 10% critical value: -4.82
Defense	2011	t-Statistic Prob. * Zivot-Andrews test statistic -3.8421 0.518114 1% critical value: -5.57 5% critical value: -5.08 10% critical value: -4.82
Health	2010	t-Statistic Prob. * Zivot-Andrews test statistic -3.8127 0.064547 1% critical value: -5.57 5% critical value: -5.08 10% critical value: -4.82
Social Protection***	2011	t-Statistic Prob. * Zivot-Andrews test statistic -5.70584 0.023023 1% critical value: -5.57 5% critical value: -5.08 10% critical value: -4.82

Egypt

Sector	Breakpoint	Significance		
Revenue**	2010		t-Statistic	Prob. *
		Zivot-Andrews test statistic	-5.2596	0.001362
		1% critical value:	-5.57	
		5% critical value:	-5.08	
		10% critical value:	-4.82	
Expenses	2013		t-Statistic	Prob. *
		Zivot-Andrews test statistic	-3.9091	0.061035
		1% critical value:	-5.57	
		5% critical value:	-5.08	
		10% critical value:	-4.82	
Defense***	2014		t-Statistic	Prob. *
		Zivot-Andrews test statistic	-8.3394	0.031093
		1% critical value:	-5.57	
		5% critical value:	-5.08	
		10% critical value:	-4.82	
Environmental Protection***	2016		t-Statistic	Prob. *
		Zivot-Andrews test statistic	-7.27012	1.15E-06
		1% critical value:	-5.57	
		5% critical value:	-5.08	
		10% critical value:	-4.82	
Health***	2013		t-Statistic	Prob. *
		Zivot-Andrews test statistic	-7.10350	9.43E-05
		1% critical value:	-5.57	
		5% critical value:	-5.08	
		10% critical value:	-4.82	

Jordan

Sector	Breakpoint	Significance
Public Order and Safety	2009	t-Statistic Prob. * Zivot-Andrews test statistic -3.0888 0.412277 1% critical value: -5.57 5% critical value: -5.08 10% critical value: -4.82
Housing Community and Amenities**	2008	t-Statistic Prob. * Zivot-Andrews test statistic -5.5533 0.004442 1% critical value: -5.57 5% critical value: -5.08 10% critical value: -4.82
Health***	2012	t-Statistic Prob. * Zivot-Andrews test statistic -6.2122 0.038403 1% critical value: -5.57 5% critical value: -5.08 10% critical value: -4.82
Education***	2008	t-Statistic Prob. * Zivot-Andrews test statistic -10.0672 1.10E-05 1% critical value: -5.57 5% critical value: -5.08 10% critical value: -4.82
Social Protection***	2009	t-Statistic Prob. * Zivot-Andrews test statistic -6.5866 0.762478 1% critical value: -5.57 5% critical value: -5.08 10% critical value: -4.82

Saudi Arabia

Social Expenditure	Breakpoint	Significance
Expenses**	2009	t-Statistic Prob. * Zivot-Andrews test statistic -5.40575 0.225250 1% critical value: -5.57 5% critical value: -5.08 10% critical value: -4.82
Public Order and Safety	2014	t-Statistic Prob. * Zivot-Andrews test statistic -4.14881 0.034908 1% critical value: -5.57 5% critical value: -5.08 10% critical value: -4.82
Housing Community and Amenities***	2013	t-Statistic Prob. * Zivot-Andrews test statistic -6.80710 0.001897 1% critical value: -5.57 5% critical value: -5.08 10% critical value: -4.82
Health	2013	t-Statistic Prob. * Zivot-Andrews test statistic -3.48655 0.029392 1% critical value: -5.57 5% critical value: -5.08 10% critical value: -4.82
Education	2007	t-Statistic Prob. * Zivot-Andrews test statistic -3.61307 0.216636 1% critical value: -5.57 5% critical value: -5.08 10% critical value: -4.82
Social Protection	2012	t-Statistic Prob. * Zivot-Andrews test statistic -3.471136 0.056588 1% critical value: -5.57 5% critical value: -5.08 10% critical value: -4.82

APPENDIX B

Data Table

Tunisia Descriptive Statistics (Percentage of GDP)

Metric	Revenu	Expense	Defense	Public Order & Safet	Environmental Protectio	Housing & Community Amenitie	Health	Educatio	Social Protectio
Min	21.27	19.66	1.26	1.97	0.29	0.85	1.34	5.39	0.4
1st Quadrant	27.78	20.07	1.445	2.047	0.34	1.23	1.508	5.765	0.4675
Median	22.9	23.93	1.515	2.215	0.41	1.48	1.685	5.88	1.025
Mean	23.28	24.48	1.692	2.234	0.5319	1.828	1.704	6.234	1.308
3rd Quadrant	24.24	28.28	2	2.3	0.73	2.445	1.87	6.562	1.9575
Max	27.5	34.64	2.7	2.84	0.99	3.39	2.46	8.02	3.25
NA				8	4	1			

Egypt Descriptive Statistics (Percentage of GDP)

Metric	Revenu	Expense	Defens	Public Order & Safet	Environmental Protectio	Housing & Community Amenitie	Healt	Educatio	Social Protectio
Min	16.7	19.54	1.1	1.4	0	0.69	1.1	2.07	0.2
1st Quadrant	18.7	22.52	1.542	1.45	0.09	0.9625	1.317	3.362	3.458
Median	19.62	25.3	1.865	1.54	0.1	1.245	1.405	3.56	7.22
Mean	20.1	24.91	1.988	1.578	0.129	1.257	1.511	3.621	6.162
3rd Quadrant	21.21	27.64	2.482	1.635	0.2	1.395	1.633	4.072	8.428
Max	25.78	30.45	3.21	1.93	0.29	2.49	2.25	4.93	10.278
NA						5			

Jordan Descriptive Statistics (Percentage of GDP)

Metric	Revenu	Expense	Defense	Public Order & Safet	Environmental Protectio	Housing & Community Amenitie	Health	Educatio	Social Protectio
Min	22.5	25.68	3.42	2.64	0	0.25	2.59	3.32	0.58
1st Quadrant	24.74	26.24	3.865	3.13	0.04	0.59	3.1	3.635	5.482
Median	26.28	27.83	4.6	3.825	0.065	0.79	3.235	3.755	5.81
Mean	27.24	28.41	4.689	3.63	0.1995	0.8075	3.214	4.035	6.113
3rd Quadrant	29.98	29.6	5.487	4	0.16	0.915	3.33	4.675	7.143
Max	33.29	34.57	6.94	4.61	1.17	1.67	4	5.04	12.59
NA									

Saudi Arabia Descriptive Statistics (Percentage of GDP)

Metric	Revenu	Expenses	Defense	Public Order and Safet	Environmental Protection	Housing & Community Amenitie	Healt	Education	Social Protectio
Min	21.5	21.9	4.215	3.275	N/A	0.9035	1.889	4.498	0.06674
1st Quadrant	29.95	28.23	4.864	4.138	N/A	0.9893	2.548	5.737	0.09219
Median	35.65	30.3	5.216	4.415	N/A	1.116	2.96	6.732	0.11963
Mean	36.33	31.18	5.44	4.36	N/A	1.1698	2.959	6.644	0.11832
3rd Quadrant	42.09	34.38	5	4.589	N/A	1.3253	3.271	7.324	0.13075
Max	56.5	40.2	7.487	5.253	N/A	1.5526	4.119	8.818	0.18408
N/A					20				

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