Beyond the Arab Spring:
Education, Earnings, and Protest Participation

M. Najeeb Shafiq
University of Pittsburgh

Anna Vignoles
University of Cambridge

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Abstract: We explore the link between educational returns and protest participation. We use data on male labor force participants collected from seven countries during the Arab Spring (2010-11) and the Arab Winter (2012-14). The estimates of rates of return to education remain positive in Egypt, Jordan, Lebanon, Sudan, Tunisia and Yemen but not Palestine. We find that the differences between actual and expected educational returns ("returns gaps") are associated with protest participation during the Arab Spring (Jordan and Yemen) and especially the Arab Winter (Egypt, Jordan, Sudan, and Yemen).

JEL Classification: I2

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1. Introduction

The strong wage returns to education observed in most studies from a wide range of different countries were used to justify efforts to bring about the impressive expansion of education participation that has occurred across the developing world during the last 20 years. Whilst we have not yet succeeded in achieving the EFA goals set out in 2000, progress has undoubtedly been made. For example, the proportion of primary age children not in school halved between 1999 and 2011 (UNESCO, 2014). However, efforts to improve actual skill levels (literacy) and the quality of education have been less successful (UNESCO, 2014), particularly in the Middle East and North Africa (MENA), the region of interest in this paper (World Bank, 2008). Further, economic conditions, and hence the demand for skill, vary wildly across countries. It therefore remains an open question as to the economic value of the education investments being made across developing countries and the return on this investment will clearly vary by context. In this paper we study the returns to education in a number of MENA countries and explore one possible consequence of the mismatch between what individuals may expect to earn as a return on their educational investment and what they actually achieve, namely political protest.

During the period 2010 to 2012 a number of countries in the Middle East and North Africa (MENA) experienced political uprising, the so-called "Arab Spring". Or as Ajami put it (2012: 56), 'Young people in search of political freedom and economic opportunity, weary of waking up to the same tedium day after day, rose up against their sclerotic masters.' The uprising evolved from 2012 to 2014, a period referred to as the "Arab Winter." This period provides a context in which to test the hypothesis that there is

a relationship between unrealized expectations about the value of education and political activity in the form of protest. We use the term "returns" to refer to labor market earnings for a given level of human capital, which in our case is measured by educational attainment and labor market experience. We distinguish between "expected returns" that refer to the earnings an individual expects for a given level of education and experience, and "actual returns" that refer to earnings an individual actually receives for a given level of education and experience. We hypothesise that differences in actual returns and expected returns are associated with protest participation. To investigate this we use nationally representative data from 2010-11 and 2012-14 in seven Arab economies: Egypt, Jordan, Lebanon, Palestine, Sudan, Tunisia, and Yemen.

One motivation for this paper is that remarkably little is known about private educational returns in a strategically and socially important region, namely the MENA (Colclough et al., 2010; Salehi-Esfahani, 2012). The MENA economies are unique in a number of respects that make an analysis of educational returns for that region particularly informative. Demographically, the proportion of young people in these economies is high because of large declines in infant mortality rates and high fertility rates from 1950 to 1980 (World Economic Forum 2012). For example, the median age in Yemen is just under 18 years of age. This "youth bulge" raises questions about the ability of the labor market to absorb such a rapid increase in more educated labor, or indeed unskilled labor. Another feature of the region is the (low) quality of education (World Bank 2008) which too raises issues about skill mismatch.

From the perspective of employers, numerous observers have noted that a persistent problem in the region is that workers lack the skills desired by employers (Gatti

et al., 2011; Rauch and Kostyshak, 2009; Yousef, 2004). This will potentially give rise to a mismatch between the apparent level of education of young people and their actual opportunities in the labor market. In particular, Heyneman (1997) has observed that MENA economies typically have shrinking state involvement and a growing share of private businesses that require different skills that may be in short supply. A final feature of the MENA economies is the cronyism under authoritarian regimes has raised concerns that personal connections ("wasta") matter more than education in determining labor market outcomes (Cunningham et al. 1994), creating distortions in the relationship between skills and earnings.[1]

In this context, might it be the case that the investments Arabs made in their education did not result in any earnings or employment gain for many individuals - leading to unemployment, underemployment, frustration and political action? Our conceptual framework, drawing on Human Capital Theory, suggests a number of reasons why individuals whose education investments do not produce the level of returns that previous cohorts earned will protest. Put differently, are low and unrealized educational returns partly responsible for the dramatic political and social change we observed in these economies during the Arab Spring and the Arab Winter? Whilst we cannot provide evidence of a causal link between the value of education in these countries and political unrest, we are able to consider two questions in this study. First, are educational returns in the MENA economies low by worldwide standards? Second, at the individual level,

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[1] As Cunningham & Yasin (1994) note, "wastah" may refer to the act of mediation or intercession, or to the person who mediates or intercedes. Intercessory wasta involves a protagonist intervening on behalf of a client for a job or admission to prestigious university. In circumstances with multiple protagonists and agents, the strongest wastas are successful. The system of intercessory wasta potentially causes anger and disenfranchisement among unsuccessful agents.

are the gaps between actual returns and expected returns correlated with protest participation?

Using data from the *Arab Barometer* 2010-11 and 2012-14 rounds, we reach several conclusions. We find evidence of positive educational returns for the MENA economies except Palestine; the returns range from 2% to 8%, indicating that some countries do clearly have lower returns than the 6.0% to 10% found in many developed economies (Gunderson and Oreopoulos, 2010). We also find expected earnings are lower than actual earnings for approximately 60% to 80% percent of labor force participants. However, we find statistical evidence supporting a link between unrealized educational returns and protest in only one economy during the Arab Spring, and three economies during the Arab Winter; this suggests that other grievances may have driven the protests by male labor force participants.

We make several contributions. We add to the limited research on educational returns in MENA economies and the gap between expected and actual returns to education. Moreover, our frameworks are useful for understanding the link between educational returns and other types of political outcomes such as political attitudes, engagement and expertise. Finally, we provide initial evidence on the validity of an explanation for the Arab Spring and the Arab Winter: that people protested because they were not getting the kind of jobs and pay they were expecting given their education and experience (Goldstone 2011, Lynch 2012).

2. Context

Here we discuss some contextual features of the countries considered. Table 1 presents some key development indicators for the seven economies. We use figures from 2010-11 because it immediately precedes the turbulence and noise of the Arab Spring and Arab Winter. The average annual economic growth rate for the 2001-2011 period exceeded the OECD average of 1.6%. Jordan, Sudan, and Lebanon experienced growth rates of over 5%. Economic growth rates in Egypt and Tunisia were more than double the OECD rates which does not provide first order evidence of a link between weak economic conditions and political uprising. Perhaps unsurprisingly, Palestine is the lowest performing economy. Per-capita incomes also range considerably across the region. Though none of the economies have incomes below the $2/day, per capita incomes are highest in Lebanon ($13,670) and lowest in Sudan ($1,910) and Tunisia ($2,435).

[Table 1 about here]

Population sizes vary greatly as well. Egypt's 81.1 million equals the total number of people in the other six economies. The median age figures support the "youth bulge" description offered by numerous demographers and observers (Assaad and Roudi-Fahimi, 2007). The lowest median age is 18.6 in Yemen and the highest median age is 31.4 in Tunisia. As we have noted, this sizable youth bulge may pose particular challenges for young people attempting to secure full-time and part-time employment.

Literacy rates also vary substantially across the economies. Over 95% of adults in Jordan and Palestine are literate. However, nearly one-quarter of adults in Egypt, Sudan and Tunisia are illiterate. At 65.3%, Yemen has the lowest adult literacy rate. In high literacy economies, there may be higher competition among highly educated labor force

participants that pushes down educational returns; at the same time, there may be externalities such as innovation that have positive impact on employment opportunities and educational returns.

These differences in literacy rates reflect the very different education systems in MENA countries, though comparable data and metrics with which to compare across countries are quite limited. Chapman and Miric (2009) and Heyneman (1997)) have suggested that despite the expansion of primary and secondary education in the region, the need for further reform in MENA education systems is pressing. Resources are used inefficiently and quality remains a major issue. Further, expansion of higher education has been particularly rapid with an increasing number of private sector providers in some countries. This has resulted in higher participation rates in most countries but again questions remain about the quality of this higher education and hence the skills of graduates.

In summary, there are variations in economic performances, literacy rates, education systems and population sizes, but similarities in youth bulge and (low) educational quality. The growing number of youth labor force participants in particular is likely to lower wage premia of youth compared to non-youth. Indeed one key feature of these countries for the purposes of this study is that MENA youth unemployment rates are the highest in the world; depending on the country, between 30 to 50 percent of 18-24 year olds are unemployed and seeking employment (World Bank, 2004). According to Lynch (2012: 2-3), 'Economies failed to produce jobs for an exploding population of young people.' What do these findings suggest about expected returns to education,

actual returns and the potential relationship of any mismatch between the two with political protest?[2]

3. Data

The data come from the second and third rounds of the *Arab Barometer* project, which conducted nationally representative public opinion surveys during the Arab Spring years 2010 and 2011, and Arab Winter years 2012, 2013, and 2014. The *Arab Barometer* is similar to public opinion surveys such as the *World Values Surveys*, and the regional *Asian Barometer*, *Afro-Barometer*, and *Latinobarómetro* (Jamal and Tessler, 2012). The key investigators of the *Arab Barometer* project, based at the University of Michigan and Princeton University, were joined by country team leaders and steering committee members from universities and research centers from each of the participating countries. Unlike the Arab Barometer I, the Arab Barometers II and III included Egypt, Palestine, Lebanon, Sudan and Yemen. We restrict our analysis to male labor force participants because the low female labor force participation (typically between one-quarter and one-third of females in the 18-55 age-group) poses problems of severe selection bias.

We begin with the sub-samples of adult males aged 18 to 55 (a typical mandatory retirement age in the public sector). Table 2 presents the shares of labor force participants (full-time employment, part-time employment, and unemployment) and non-labor force participants.[3] The 80-90 percent labor force participation rate suggests that selection in to

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[2] In a series of sophisticated studies, Campante and Chor (2012; 2014) address the role of education, income, and Arab Spring protests using data from the *World Values Surveys* that was collected *before* the Arab Spring. In contrast, we use *Arab Barometer* data that was collected during the Arab Spring and Arab Winter.

[3] The wage data in the Arab Barometer have several shortcomings. Notably, the wages reported are monthly wage rates unadjusted for hours worked. The respondents with missing wage observations are dropped, but missing data in excess of 20% of the sample raises concerns with selection in Lebanon, Sudan

the labor force is not a major methodological issue in an analysis of males. Egypt, Tunisia, and Yemen have the highest shares of males (nearly one-quarter) who are unemployed; this is consistent with the observation that countries that experienced the highest level of protests and political change had high levels of unemployment. In all economies, over half of males in the 18-55 age-group are engaged in full-time employment.

[Table 2 about here]

Table 3 presents the mean educational attainment (years) of male labor force participants during the Arab Spring (2010-11) and Arab Winter (2012-14). Notably, the educational attainment of full-time employees is actually lower than that of part-time workers and the unemployed in Egypt (2010-14), Jordan (2010-14), Sudan (2012-14 only), and Lebanon (2012-14 only). The other curious pattern in Table 3 is that educational attainment is also lower among part-time workers than the unemployed in Egypt (2010-14), Jordan (2010-14), Lebanon (2014), Tunisia (2010-11 only), and Yemen (2010-11 only). These facts, whilst only indicative, are perhaps suggestive evidence of queuing: some more educated people may be unable to secure employment or are not be satisfied with the low wage full-time and part-time employment available, and are instead tolerating unemployment in the hope of securing high-paying full-time employment.

[Table 3 about here]

Figure1shows the kernel density distributions of inflation-adjusted monthly earnings of male labor force participants during the Arab Spring and Arab Winter; all values are in 2010 US$. The rightward shift of the earnings distribution in Egypt,

and Yemen (though of course non response rates to standard Labour Force Surveys in OECD countries are often similar).

Lebanon, Tunisia and especially Sudan and Tunisia indicate improvements in earnings. This pattern is consistent with Sudan's economic crisis during the Arab Spring, and Tunisia's steady democratic transition. There are no visible shifts in the earnings distribution in Jordan and Palestine, which is consistent with the relative lack of economic and social change during Arab Spring and Arab Winter. The leftward shift in the earnings distribution in Yemen reflects the worsening economic and social turmoil. As we will show in a later section, there is also large variation in earnings among individuals with comparable education and experiences.[4]

[Figure 1 about here]

Table 4 shows the protest participation rates by labor force status. In most countries, the Arab Barometer asked the following question on protest participation: "During the past 3 years, did you participate in a protest, march, or sit-in?" We code *protest* = 1 if response is "once" or "more than once", = 0 if "I have never participated."[5] During both the Arab Spring and Arab Winter, protest rates are lowest in Jordan (11.2% and 6.4%) and highest in Yemen (48.8% and 64.5%). Over this period, protests are unchanged in Egypt but rise in Palestine and Yemen. There is a dramatic decline in Tunisia, where relatively steady and collaborative efforts to advance democracy have been acknowledged by Nobel Peace Prizes in 2011 and 2015. In contrast, Yemen protests rising protest rates are indicative of deepening political and economic crisis.

[Table 4 about here]

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[4] For all but two countries in the ABIII, incomes were in US$. Palestinian income in ABIII were in Israeli New Shekels; this was converted to US$ using a conversion rate of US1=3.8 Shekels. Similarly, Yemeni income in ABIII were in US$1=215 Yemeni Rials.

[5] The questions differed for Egypt and Tunisia in the Arab Barometer 2010-11 cited contexts. In Egypt, respondents were asked: "Did you participate in the protests against former president Hosni Mubarak between Jan. 25 and Feb. 11, 2011?" In Tunisia, respondents were asked: "Did you participate in the protests against former president Zain Al- Abdeen Ben Ali between Dec 17, 2010 and Jan 14, 2011?"

According to the table 4, perhaps surprisingly, it is not the case that protest rates are uniformly higher amongst the unemployed, as one might have anticipated. These data are descriptive and do not account for individuals' education levels and we return to this issue in a multiple regression framework later in the paper.

4. Conceptual Framework

In his 1980 Nobel acceptance speech, Theodore Schultz expressed optimism on the 'income equalizing potential of education.' Essentially, Schultz argued that individuals with identical levels of education and work experience should earn similar wages in the labor market. In practice, however, there is evidence of large gaps in returns for individuals with comparable levels of education and experience (e.g., Buchinsky 1994). Theoretically there are a number of potential explanations for this. One explanation might be that education quality and hence the skills acquired varies, and the apparent differences in rates of return actually reflect genuine skill differences. Alternatively, differences in rates of return may reflect rigidities in the labour market, again caused by a variety of problems including perhaps "wastah" or personal connections. In either case one might expect that individuals who have had raised expectations about their likely earnings from their investment in education would feel aggrieved if those expectations are not realized. This may lead to political protest. In our conceptual framework, we consider the implications of returns gaps on the probability of protesting.

Let us assume that the expected returns of labor force participants are based on the mean earnings of full-time workers with identical education and experience. In many

cases, the actual returns of most labor force participants will deviate from their expected returns. In particular, the unemployed, underemployed (or part-time workers), and even full-time workers in low-wage occupations will find that their actual returns are smaller than their expected returns. Conversely, for some labor force participants such as full-time workers in elite occupations, their actual returns may exceed their expected returns. Figure 2 presents two basic social science frameworks—the traditional human capital theory and political economy frameworks—that link the relationship between returns gaps and protest participation.

[Figure 1 about here]

A *traditional economic theory* framework predicts a downward sloping relationship between the educational returns gap and protest participation. The mechanism is straightforward: the more that the actual return exceeds the expected return, the greater the opportunity costs from protest participation, holding all else constant. Hence more privileged individuals with high returns to their education will be less likely to protest. Assuming some positive benefit accrues to the individual from protesting, those with lower opportunity costs will be more likely to protest (Berman et al., 2011). In addition, individuals consider their relationship relative to others, such that negative gaps are associated with disutility (disenfranchisement) and positive gaps are associated with utility (Dooley and Prause, 2004).

A *political economy* framework predicts an upward sloping association between returns gaps and protest participation. This framework draws from the historical and contemporary research on MENA that concluded that disenfranchised individuals (low returns in absolute terms and relative to expected returns) are too demoralized to be

politically active (Lerner, 1958; Krueger, 2007). The privileged individuals are arguably most likely to protest because they have most to potentially gain from changing the system.

A third possibility of course is that people protest for reasons other than returns gaps, such as other disappointments, governance failures, class conflicts, religion, and the impact of foreign intervention (Kuran, 1989; Beissinger et al., 2015; Hoffman and Jamal, 2014). If such non-labor market factors dominate, we should observe no relationship between returns gaps and protest participation.

The relationship described above may be heterogenous across both the education level of the individual and the magnitude of the returns gap. For example, in a human capital theory framework low educated individuals will protest more irrespective of their returns gap, since the opportunity cost of protest is less for them. Political economy explanations suggest the reverse - if individuals have low education, low status and feel disenfranchised they are less likely to protest. By contrast, human capital theory suggests that high educated individuals may be less likely to protest as the opportunity cost is higher (or again the reverse if political economy explanations hold). The key point here is that there are two distinct questions we need to answer: first what is the relationship between an individual's education level and their likelihood of political protest. Second, conditional on education level, are individuals who experience returns gap more or less likely to protest and does this relationship vary according to the magnitude of the gap? We do not estimate a causal model in this paper but our empirical investigations attempt to shed some light on these complex issues.

5. Analysis

We follow several steps to investigate the relationship between education, earnings, and protest participation. First, we estimate the relationship between education level and the likelihood of protest, using a standard probit model. Second, we use the original human capital earnings function equation and samples of full-time workers to predict the monthly earnings of each labor force participant based on country, educational attainment, and years of experience. From this we create new variables to measure the relative position of each labor force participant, which are constructed using the formula: educational returns gap = actual educational returns - expected educational returns. To account for the possible non-linear relationship between protest participation and educational returns gaps we use this variable to construct five quintile dummy variables (or five bins), such that the bottom quintile reflects substantially *lower* actual returns than expected returns (i.e., most disenfranchised), while the top quintile reflects substantially *higher* actual returns than expected returns (i.e., most privileged). We then use this to estimate a probit of the likelihood of protest and the relationship with the magnitude of this returns gap (conditioning on the person's education level).

5.1 The relationship between education level and protest

We estimate a probit model where the dependent variable takes the value of one if the individual participates in protest and zero otherwise. Table 5 presents the marginal effects from this probit regression model of the relationship between educational attainment and protest participation, after controlling for employment status, labor market experience,

marital status, and region (urban or rural). In Model 1, we use years of schooling as the key explanatory variable. In Model 2, we use educational attainment dummy variables.

[Table 5 about here]

The analysis from the Arab Spring (Panel 1) shows a strong association between university education and protest participation in Egypt and Yemen but not elsewhere. Every additional year of schooling is associated with a 1.7 percentage point (ppt) and 4.6 ppt higher probability of protest participation in Egypt and Yemen, holding other factors constant. Model 2 illustrates that the university educated in Egypt were 19.8ppt more likely to protest than those with only primary education; however, there are no differences in the probabilities of protest among individuals with primary education, secondary education, and vocational education. In Yemen, individuals with secondary, vocational, and university education are 21.0ppt, 28.3ppt, and 27.8ppt more likely to protest than those with primary education, after controlling for other characteristics. Thus, there is no statistical association between education and protest participation during the Arab Spring in Jordan, Lebanon, Palestine, Sudan and Tunisia.

There are more instances of statistically significant associations between educational attainment and protest participation during the Arab Winter. According to the Model 1 results, an additional year of education is associated with 2.6ppt, 0.7ppt, 2.8ppt and 3.9ppt higher likelihood of protest participation in Egypt, Jordan, Sudan, and Tunisia respectively. The Model 2 results for Egypt, Sudan, Tunisia, and Yemen show large statistically significant differences between those with primary education and post-secondary education. In both the Arab Spring and Arab Winter, there is a statistically

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significant relationship between education and protest participation in Lebanon and Palestine, after controlling for other observable characteristics.

In summary, in many countries we find some evidence of a statistical association between education level and protest participation, more so during the Arab Winter than the Arab Spring. This may be because the Arab Spring was the more chaotic event, where other grievances and unobserved factors may have contributed more to protest participation than education.

5.2 An estimation of educational returns for full-time workers

We now construct our measure of expected returns to education - based on the actual earnings of full time employees. We estimate a human capital earnings function, which takes the following form:

$$\ln(earnings) = \beta_0 + \beta_1 educ + \beta_2 exper + \beta_3 exper^2 + u$$

where the dependent variable is a labor force participant's natural log of monthly earnings. The coefficients on educational attainment (*educ*), years of work potential work experience (*exper*), and years of potential work experience squared (*exper2*); the mean of error term (*u*) is zero. As usual the explanatory variables are treated as if they are independent of the disturbance term in the wage relation and there is no control for selectivity into full-time employment, nor education. Hence again a causal interpretation of the relationship between the explanatory variables and earnings is not possible. The key independent variable is years of schooling, and the coefficient on the education variable is interpreted as the mean percent increase in earnings associated with an additional year of schooling.

Some assumptions are required to interpret the coefficient on education as a return on an education investment, including negligible direct costs of schooling (e.g., tuition and fees), indirect costs (i.e., foregone earnings), and psychological costs. However, the major limitation of the analysis is that lack of data prevents us from including control variables such as ability (e.g. test score) and family background information (Blundell et al 2005). This means that in our work the gap between predicted earnings and actual earnings, which we loosely describe as the returns gap, may reflect differences in individuals' abilities potentially, as distinct from unrealized talent not being rewarded in the labour market. However, our aim here is not to estimate the return to education accurately, rather to measure the difference between expected and actual earnings. We suggest that individuals' expectations about their wages are based on their view of the labour market which is likely to be dominated by what the average person earns as a return to their education. There is also of course an argument that education attracts a return in the labour market because of its signaling value, as distinct from being productivity enhancing as predicted by human capital. Again we remain agnostic between these two theoretical explanations for the role of education in the labour market but simply note that individuals' expectations about their earnings are likely to be based on average realized returns.

Table 6 presents estimates of the value of an additional year of schooling. The point estimate for years of schooling during the Arab Spring (2010-11), under the common Mincerian (1974) interpretation, implies the following 'return' for a year of schooling (in ascending order): 1.9% in Sudan, 4.0% in Lebanon, 5.7% in Yemen, 6.3% in Egypt, 6.6% in Jordan, and 8.1% in Tunisia. The coefficient for Palestine is

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statistically insignificant at the 10% level. The point estimates of the value of an additional year of schooling in the Arab Winter (2012-14) are as follows (in ascending order): 3.8% in Lebanon, 5.2% in Sudan, 5.9% in Egypt, 6.1% in Jordan, 6.6% in Yemen, 11.7% in Tunisia. Again, the coefficient for Palestine is statistically insignificant. Thus, from the Arab Spring to the Arab Winter, returns improved in Sudan, Tunisia, and Yemen, but declined in Egypt, Jordan, and Lebanon.

[Table 6 about here]

From a comparative perspective, the estimates of the return to education in the seven Arab economies are slightly lower than the 10% mean observed for males in 52 developing countries (Patrinos and Psacharapooulos 2007). The R^2 values indicate that the human capital earnings function explains between 1.6% to 18.0% of the variation in the natural log of monthly earnings of full-time workers in the seven economies. The slightly higher R^2 values for the 2012-14 round are likely to reflect the relative stability following the Arab Spring.[6]

5.3 A comparison of expected earnings versus actual earnings

Using the results described in section 5.2 for each economy, we predict earnings for all labor force participants: full-time workers, part-timer workers and the unemployed.[7] We propose that these predicted earnings are the earnings that labor force participants will expect to earn given their educational attainment and experience. In

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[6] For the UK, most researchers choose to adopt to adopt the non-linear approach and focus on qualifications rather than years of education (Blundell et al. 2005); this approach is appropriate because Arab education systems were shaped by the Colonial British system. We considered non-linear returns but do not incorporate those results in the analyses in the main text because it is difficult to estimate returns gap using non-linear specifications.
[7] We follow Cameron and Trivedi (pp. 108-111, 2010) is dealing with the "transformation problem" in predictions in logs.

other words, all labor force participants will develop their expected returns by examining the average earnings of a full-time worker with identical educational attainment and work experience.

We can now create the educational returns gap variable to measure the relative position of each labor force participant. The returns gap variable is computed by subtracting expected educational returns from actual educational returns. From these data we also construct five quintile dummy variables (or five bins), such that the bottom quintile reflects substantially *lower* actual returns than expected returns (i.e., most disenfranchised), while the top quintile reflects substantially *higher* actual returns than expected returns (i.e., most privileged).

Table 7 presents estimates of the gap between expected and actual returns gaps by quintiles for male labor force participants in each economy during the Arab Spring and Arab Winter. In most countries we see substantial returns gaps, expressed in dollars per month. The sizes of returns gaps are smallest in Egypt, suggesting that most individuals earn slightly above or below their expected returns, and greatest in Palestine. The large gaps between expected and actual returns are not surprising perhaps, given that they are largely driven by the high share of the labor force who are unemployed or underemployed.

[Table 7 about here]

5.4. The relationship between returns gaps and the likelihood of protest

In this last step, we regress protest participation on the earnings gap dummies and control variables for labor force participants in each economy. We estimate the following probit regression model:

$$P(protest = 1|x) = \Phi(\beta_0 + \beta_1 qgap1 + \beta_2 qgap2 + \beta_3 qgap4 + \beta_4 qgap5 + \beta_5 educ)$$

where the *qgap* variables are returns gap dummy variables. The reference group (*qgap3*) consists of labor force participants whose actual earnings are comparable to their expected earnings. We expect to observe positive and statistically significant coefficients in lower deciles, thus indicating the greater likelihood of protest participation among labor force participants who actual earnings are lower than expected earnings.

Table 8 shows the results of this regression. The results in Panel A provide little evidence of an association between returns gaps and protest participation during the Arab Spring. In Yemen, the results indicate an inverse-U shaped relationship that suggests that the severely disenfranchised *and* most privileged are least likely to protest during the Arab Spring. In particular, individuals in returns gap quintiles 2, 3, and 4 are 23ppt, 22ppt, and 16ppt more likely to protest than individuals in quintile 1 (severely disenfranchised). These findings might suggest that the political economy explanation is valid for individuals facing highly negative gaps, but the economic (opportunity cost) explanation holds for the most privileged. They are not replicated in other countries. There is weak statistical evidence from Jordan that suggests that individuals in quintile 5 (most privileged) are 10.3ppt more likely to protest than individuals in quintile 1 during the Arab Spring.

[Table 8 about here]

Panel B in Table 8 presents the results of regressing protest participation on educational returns gap quintiles during the Arab Winter. In Egypt, Jordan, and Sudan, the most privileged are 10ppt, 9ppt, and 15ppt more likely to protest than the most disenfranchised. This again provides some support for the political economy explanation, such that the most privileged protest because they stand to gain after a revolution. In Yemen, however, quintile 2 (disenfranchised) individuals are 15ppt more likely to protest than the severely disenfranchised; this can be interpreted as an inverse-U shaped relationship though the evidence is limited and somewhat inconsistent.[8]

6. Discussion and Conclusion

We find that men who are able to secure full-time employment enjoy positive but variable returns to education in the seven Arab economies considered, during the Arab Spring (2010-11) and the Arab Winter (2012-14). Quality issues notwithstanding, this provides some evidence of the value of education, including higher education, in MENA countries, though the return is low by international standards in some countries. We also find that education is positively associated with the likelihood of protest, though again the pattern is somewhat varied across the seven economies. In particular, we find fewer instances of an association between educational attainment and protest participation during the Arab Spring (Egypt and Yemen only) compared to the Arab Spring (Egypt, Sudan, Tunisia, and Yemen).

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[8] Blanchflower and Oswald (2000) and others have documented the gaps in well-being between youth and non-youth in industrialized countries. Accordingly, we reanalyzed the regressions using sub-samples of youth and non-youth. We do not observe patterns supporting the traditional or political economy models, possibly because of the small sample sizes.

We find weak and mixed evidence that the gap in actual and predicted educational returns is related to protest participation: the relationship varies considerably across countries and across the two time periods. During the Arab Spring, there is some evidence that returns gaps were associated with protest participation in Yemen and to a lesser extent Jordan. The relationship was weak or insignificant in most of the countries however, and in all likelihood, other grievances were responsible for people's decision to protest during the Arab Spring.

In contrast, during the Arab Winter, we find statistically significant relationships between educational returns gaps and protest participation in Egypt, Jordan, Sudan, and Yemen. In particular, we find some limited support for a political economy framework with higher likelihoods of protest participation among the most privileged labor force participants in Egypt, Jordan, and Sudan.

One interpretation of our work is that education may raise individuals' expectations about their earnings and if these expectations are not met the individuals affected are more likely to undertake political protest. However, this does not mean that investment in education is necessarily a bad thing, nor that the link with protest is causal. Certainly we also found evidence of a positive association between education and earnings signifying the economic value of education investments. Of course, labor market outcomes, and participating in political and social change are only some of the economic benefits of education. We are mindful of other potential returns to education, in the form of lower fertility rates, better health and more civic participation. Our analysis therefore provides insight into the working of the labor market in these countries rather than providing prescriptive answers about the level of education investment that is optimal.

References

Berman, Eli, Michael Callen, Joseph Felter, and Jacob Shapiro (2011). "Do Working
Men Rebel? Insurgency and Unemployment in Afghanistan, Iraq, and the
Philippines," *Journal of Conflict Resolution* 55(4), pp. 496-528.

Beissinger, Mark, Amaney Jamal, and Kevin Mazur (2015). "Explaining divergent
revolutionary coalitions: Regime strategies and the structuring of participation in
the Tunisian and Egyptian revolutions," *Comparative Political Studies*,
forthcoming.

Blanchflower, David and Andrew Oswald (2000). "The Rising Well-Being of the
Young," in *Youth Employment and Joblessness in Advanced Countries*, edited by
David Blanchflower and Richard B. Freeman. Chicago: NBER and University of
Chicago Press.

Blundell, Richard, Lorraine Dearden and Barbara Siansei (2005). "Evaluating the effect
of education on earnings: models, methods and results from the National Child
Development Survey," *Journal of the Royal Statistical Society A* 168(3), 473-512.

Buchinsky, Moshe. 1994. Changes in the U.S. wage structure 1963-1987: Application of
quantile regression. *Econometrica* 62(2), pp. 405-458.

Campante, Filipe and David Chor (2014). "'The People Want the Fall of the Regime':
Schooling, Political Protest, and the Economy," *Journal of Comparative
Economics* 42(3), pp. 495-517.

Campante, Filipe and David Chor (2012). "Schooling, Political Participation, and the

     Economy," *Review of Economics and Statistics* 94(4), pp. 841-859.

Chapman, David and Suzanne Miric (2009). "Education quality in the Middle East,"

     International Review of Education 55(4), pp. 311-344.

Colclough, Christopher, Geeta Kingdon and Harry Patrinos (2010). "The changing

     pattern of wage returns to education and its implications," *Development Policy*

     Review, 28, 733-747.

Cunningham, Robert and Yasin Sarayrah (1994). "Taming 'Wasta' to Achieve

     Development," *Arab Studies Quarterly* 16(3), pp. 29-41.

Dooley, David and Joanne Prause (2004). *The Social Costs of Underemployment:*

     Inadequate Employment as Disguised Unemployment. New York: Cambridge

     University Press.

Gatti, Roberta, Diego Angel-Urdinola, Joana Silva and Andras Bodor. 2011. *Striving for*

     better jobs: the challenge of informality in the Middle East and North Africa

     region. MENA Knowledge and Learning Quick Notes Series, no. 49.

     Washington, DC: World Bank.

Heyneman, Stephen (1997). "The quality of education in the Middle East and North

     Africa (MENA)," *International Journal of Educational Development* 17(4), pp.

     449-466.

Hoffman, Michael and Amaney Jamal (2014). "Religion in the Arab Spring: Between

     two competing narratives," *Journal of Politics* 76(3), pp. 593-606.

Jamal, Amaney and Mark Tessler (2012). "The Arab Barometer: Taking stock after five years," *The American Political Science Association- Comparative Development Newsletter*, 10(3).

Lerner, Daniel (1958). *The Passing of Traditional Society*. Glencoe, IL: Free Press.

Krueger, Alan (2007). *What Makes a Terrorist: Economics and the Roots of Terrorism*. Princeton, NJ: Princeton University Press.

Kuran, Timur (1989). "Sparks and Prairie Fires: A Theory of Unanticipated Political Revolution," *Public Choice* 61, pp. 41-74.

Madestam, Andreas, Daniel Shoag, Stan Veuger, and David Yanagizawa-Drott. "Do Political Protests Matter? Evidence from the Tea Party Movement." *Quarterly Journal of Economics* 128.4 (2013).

Rauch, James and Scott Kostyshak (2009). "The Three Arab Worlds," *Journal of Economic Perspectives* 23(3), pp. 165-88.

Salehi-Isfahani, Djavad (2012). "Education, jobs, and equity in the Middle East and North Africa," *Comparative Economic Studies* 54(4), pp. 843-861.

Schultz, Theodore (1982). *Investing in People: The Economics of Population Quality*. Berkeley, CA: University of California Press.

World Bank (2008). *MENA Development Report: The Road Not Traveled—Education Reform.* Washington, DC; The World Bank.

World Bank (2010). *World Development Report 2011*. Washington: World Bank.

World Bank (2012a). *World Development Report 2013: Jobs*. Washington: World Bank.

World Economic Forum (2012b). *Regional Agenda: Addressing the 100 Million Youth Challenge Perspectives on Youth Employment in the Arab World in 2012*. World Economic Forum: Geneva, Switzerland.

Yousef, Tarek (2004). "Development, Growth, and Policy Reform in the Middle East and North Africa since 1950," *Journal of Economic Perspectives* 18(3), pp. 91-116.

Table 1: Development indicators

	Economic growth rate, 2001-11	GNI/capita, 2010 (US$)	Population (millions)	Median age (years)	Literacy rate (%)	Regime
Egypt	4.6%	$2,340	81.1	25.1	73.9	Authoritarian
Jordan	6.0%	$4,350	6.0	21.8	95.9	Authoritarian
Lebanon	5.0%	$9,020	4.2	29.3	89.6	Hybrid
Palestine	2.6%	$4,574	4.2	22.4	95.3	Hybrid
Sudan	5.5%	$1,270	43.6	19.1	71.9	Authoritarian
Tunisia	3.9%	$4,070	10.5	31.4	79.1	Flawed democ.
Yemen	2.9%	$1,060	24.1	18.6	65.3	Authoritarian

Notes: Refers to completion. Growth rates and GNI/capita figures obtained from the World Development Indicators, World Bank and 2012 World Development Report. Palestine obtained from "West Bank and Gaza" figures for 2001 to 2005. Median ages and literacy rates obtained from the CIA's World Factbook (last accessed: 28 April 2014). Literacy rate refers to people age 15 and over who can read and write. Males typically have much higher literacy rates: Egypt: 81.7 vs. 65.8; Jordan: 97.7 vs. 93.9; Lebanon: 93.4 vs. 86; Palestine: 97.9 vs. 92.6; Sudan: 80.7 vs. 63.3; Tunisia: 87.4 vs. 71.1; Yemen: 82.1 vs. 51.8. Within Palestine, income in West Bank is $1924 while Gaza is only $876.

Table 2: Shares of male labor force participants and non-participants

	Obs.	Labor force participants:			Labor force non-participants	Total
		Full-time	Part-time	Unemployed		
Panel A: Arab Spring (2010-11)						
Egypt	506	56.7%	23.4%	10.5%	9.3%	100%
Jordan	535	59.5%	13.8%	9.2%	17.4%	100%
Lebanon	650	69.8%	13.6%	4.3%	12.3%	100%
Palestine	498	52.1%	24.0%	5.0%	18.9%	100%
Sudan	797	57.4%	22.3%	1.2%	19.2%	100%
Tunisia	513	50.2%	12.2%	23.0%	14.7%	100%
Yemen	575	50.9%	21.0%	14.2%	13.9%	100%
Panel B: Arab Winter (2012-14)						
Egypt	508	54.2%	25.4%	10.7%	9.7%	100%
Jordan	761	57.3%	12.9%	11.1%	18.7%	100%
Lebanon	463	76.1%	9.9%	2.3%	11.7%	100%
Palestine	497	54.5%	20.4%	10.5%	14.6%	100%
Sudan	544	39.8%	20.0%	25.3%	14.9%	100%
Tunisia	465	38.3%	14.0%	32.4%	15.2%	100%
Yemen	536	39.0%	27.6%	14.5%	19.0%	100%

Sources: Arab Barometer II (2010-11) and III (2012-14).

Notes: All figures are weighted. Males in the 18-55 age-group. Total may not add to 100.00 because of rounding. Non-participants include students, retirees, and the disabled.

Table 3: Mean educational attainment (years) of male labor force participants

	Obs.	Full-time	Part-time	Unemployed
		Mean (SE)	Mean (SE)	Mean (SE)
Panel A: Arab Spring (2010-11)				
Egypt	462	12.09 (.26)	9.99 (.46)	12.13 (.64)
Jordan	432	13.46 (.14)	12.32 (.33)	13.64 (.37)
Lebanon	559	11.50 (.15)	11.82 (.32)	11.92 (.57)
Palestine	404	12.79 (.18)	11.29 (.29)	12.24 (.61)
Sudan	611	12.57 (.21)	11.13 (.35)	13.29 (1.12)
Tunisia	403	10.33 (.27)	8.88 (.52)	9.60 (.49)
Yemen	487	13.18 (.29)	12.77 (.38)	12.95 (.34)
Panel B: Arab Winter (2012-14)				
Egypt	472	10.81 (.40)	7.75 (.62)	10.82 (1.01)
Jordan	595	10.70 (.38)	11.18 (.35)	11.32 (.33)
Lebanon	412	11.82 (.19)	11.05 (.56)	12.77 (1.28)
Palestine	419	13.48 (.19)	12.58 (.30)	11.82 (.40)
Sudan	447	12.02 (.27)	10.46 (.36)	7.13 (.26)
Tunisia	401	11.85 (.23)	10.77 (.43)	10.74 (.37)
Yemen	416	7.24 (.36)	8.54 (.46)	8.53 (.58)

Sources: Arab Barometer II (2010-11) and III (2012-14).
Notes: Total may not add to 100.00 because of rounding. Non-participants include students, retirees, and the disabled.

Table 4: Protest participation rates (%) of male labor force participants by employment status

	Obs.	Overall	Full-time worker	Part-time worker	Unemployed
Panel A: Arab Spring (2010-11)					
Egypt	462	16.2%	17.6%	12.3%	16.6%
Jordan	432	11.2%	12.8%	6.7%	6.9%
Lebanon	559	22.6%	21.2%	30.5%	19.8%
Palestine	404	33.9%	34.8%	34.9%	19.9%
Sudan	611	28.8%	28.0%	30.3%	43.7%
Tunisia	403	30.3%	30.1%	30.4%	30.7%
Yemen	487	48.8%	47.4%	55.1%	44.4%
Panel B: Arab Winter (2012-14)					
Egypt	472	16.5%	19.4%	13.6%	9.1%
Jordan	595	6.4%	5.9%	7.1%	8.1%
Lebanon	412	25.3%	25.8%	20.5%	28.6%
Palestine	419	43.3%	44.9%	39.9%	41.3%
Sudan	447	26.7%	26.0%	19.5%	33.4%
Tunisia	401	21.2%	19.5%	21.2%	23.3%
Yemen	416	64.5%	63.5%	66.3%	63.5%

Sources: Arab Barometer II (2010-11) and III (2012-14).
Notes: Total may not add to 100.00 because of rounding. Non-participants include students, retirees, and the disabled. The Arab Barometer asked the following question on protest participation: "During the past 3 years, did you participate in a protest, march, or sit-in?" We code *protest* = 1 if response is "once" or "more than once", = 0 if "I have never participated."

Table 5: Probit model of relationship between education attainment and political protest

	Obs.	Model 1		Model 2			
		schooling Marg. Effect ×100	Controls	*secondary* Marg. Effect ×100	*vocational* Marg. Effect ×100	*university* Marg. Effect ×100	Controls
Panel A: Arab Spring (2010-11)							
Egypt	461	1.67** (.50)	Yes	6.53 (6.99)	7.90 (5.89)	19.83** (6.15)	Yes
Jordan	431	.73 (.64)	Yes	-.44 (4.45)	.04 (5.42)	4.05 (5.13)	Yes
Lebanon	559	.95 (.62)	Yes	3.85 (4.38)	3.31 (5.70)	3.09 (6.31)	Yes
Palestine	402	.93 (.62)	Yes	3.91 (4.38)	3.26 (5.69)	2.85 (6.28)	Yes
Sudan	604	.67 (.60)	Yes	3.26 (6.54)	8.98 (8.24)	4.26 (5.84)	Yes
Tunisia	403	.16 (.70)	Yes	-8.03 (5.87)		8.20 (7.44)	Yes
Yemen	476	4.63** (1.12)	Yes	21.02** (8.50)	28.32** (8.03)	27.81** (8.51)	Yes
Panel B: Arab Winter (2012-14)							
Egypt	472	2.62** (.45)	Yes	28.55** (8.74)	30.66** (9.03)	37.31** (10.20)	Yes
Jordan	595	.66** (.26)	Yes	-18.21 (2.22)	11.42** (5.26)	2.37 (3.15)	Yes
Lebanon	412	.26 (.68)	Yes	-10.84* (6.09)	3.32 (7.82)	3.78 (5.82)	Yes
Palestine	419	1.99 (1.27)	Yes	10.28 (8.78)	19.23 (11.65)	13.08 (9.55)	Yes
Sudan	447	2.78** (.81)	Yes	23.20** (8.08)	27.50** (11.65)	28.88** (9.56)	Yes
Tunisia	401	3.85** (.80)	Yes	11.25* (6.76)	n.a.	34.13** (8.27)	Yes
Yemen	414	1.17 (.77)	Yes	-8.56 (10.81)	8.70 (8.85)	17.21** (6.45)	Yes

Sources: Arab Barometer II (2010-11) and III (2012-14).
Notes: * $p<.10$, ** $p<.05$. Control variables include

Table 6: OLS estimates of educational returns, male full-time workers only

	Arab Spring, 2010-11				Arab Winter, 2012-14			
	Obs.	Coeff. *educ*	Coeff. *exper*	R^2	Obs.	Coeff. *educ*	Coeff. *exper*	R^2
Egypt	272	.063** (.010)	.027* (.015)	.138	299	.059** (.009)	.019** (.009)	.150
Jordan	317	.066** (.019)	.025 (.018)	.050	416	.061** (.008)	.041** (.008)	.180
Lebanon	382	.040** (.010)	.045** (.010)	.095	339	.038** (.009)	.045** (.010)	.106
Palestine	258	.058 (.031)	.010** (.031)	.042	253	.041 (.026)	.049* (.027)	.031
Sudan	331	.019* (.011)	.014 (.013)	.016	182	.052** (.013)	.010 (.015)	.087
Tunisia	228	.081** (.014)	.006 (.017)	.145	188	.117** (.021)	-.006 (.025)	.152
Yemen	233	.057** (.025)	.026 (.021)	.039	197	.066** (.026)	.120** (.040)	.084

Sources: Arab Barometer II (2010-11) and III (2012-14).
Notes: * $p<.10$, ** $p<.05$. Coefficients for experience-squared are not shown.

Table 7: Size of returns gaps (2010 US$) by returns gap quintiles, all male labor force participants

	Obs.	Quintile 1 (Severely disenfranchised)	Quintile 2	Quintile 3	Quintile 4	Quintile 5 (Privileged)
Panel A: Arab Spring (2010-11)						
Egypt	406	-$121	-$77	-$51	-$11	$192
Jordan	427	-$460	-$259	-$177	-$80	$403
Lebanon	466	-$571	-$306	-$158	$62	$847
Palestine	403	-$1038	-$772	-$595	-$379	$153
Sudan	450	-$143	-$95	$53	$7	$370
Tunisia	387	-$370	-$214	-$116	-$36	$239
Yemen	322	-$180	-$113	-$77	-$39	$277
Panel B: Arab Winter (2012-14)						
Egypt	433	-$83	-$43	-$17	$17	$142
Jordan	566	-$29	-$15	-$7	-$2	$37
Lebanon	385	-$85	-$55	-$32	$9	$164
Palestine	415	-$119	-$83	-$61	-$37	$42
Sudan	366	-$60	-$31	-$11	$23	$192
Tunisia	381	-$85	-$52	-$31	-$13	$30
Yemen	373	-$133	-$82	-$59	-$39	$7

Sources: Arab Barometer II (2010-11) and III (2012-14).
Notes: Computed using samples of male labor force participants in each economy. The $ values reflect the difference in expected and actual monthly earnings.

Table 8: Probability of protest participation by returns gap quintile, all labor force participants

	Obs.	Q1 (Severely disenfranchised)	Q2	Q3	Q4	Q5 (Privileged)	Controls	Pseudo-R^2
Panel A: Arab Spring (2010-11)								
Egypt	461	Reference	-.020 (.047)	-.016 (.048)	.027 (.059)	.066 (.054)	Yes	.076
Jordan	431	Reference	.053 (.058)	.001 (.053)	.049 (.059)	.103* (.063)	Yes	.019
Lebanon	559	Reference	.050 (.057)	.008 (.055)	-.019 (.054)	.017 (.055)	Yes	.009
Palestine	402	Reference	-.111 (.069)	.065 (.077)	.014 (.076)	-.042 (.074)	Yes	.053
Sudan	604	Reference	.025 (.056)	.037 (.058)	-.004 (.057)	-.020 (.056)	Yes	.007
Tunisia	403	Reference	.043 (.075)	.077 (.076)	-.006 (.074)	.086 (.075)	Yes	.012
Yemen	476	Reference	.227** (.068)	.219** (.068)	.158** (.071)	-.002 (.073)	Yes	.038
Panel B: Arab Winter (2012-14)								
Egypt	472	Reference	.036 (.058)	.067 (.064)	.040 (.063)	.099* (.062)	Yes	.069
Jordan	594	Reference	.027 (.039)	.016 (.038)	-.017 (.033)	.094** (.047)	Yes	.037
Lebanon	412	Reference	.005 (.063)	.032 (.065)	-.013 (.062)	-.077 (.057)	Yes	.015
Palestine	419	Reference	-.066 (.075)	-.080 (.075)	.109 (.078)	-.098 (.074)	Yes	.036
Sudan	447	Reference	.010 (.065)	.065 (.068)	.098 (.068)	.146** (.070)	Yes	.024
Tunisia	401	Reference	-.040 (.055)	-.044 (.054)	-.014 (.059)	.008 (.058)	Yes	.073
Yemen	414	Reference	.067 (.069)	.145** (.067)	-.064 (.073)	.038 (.069)	Yes	.027

Sources: Arab Barometer II (2010-11) and III (2012-14).

Notes: * $p<.10$, ** $p<.05$. Computed using samples of male labor force participants in each economy. Control variables include employment status, labor market experience, marital status, and region (urban or rural).

Figure 1: Traditional human capital and political economy explanations of the relationship between educational return gaps and protest
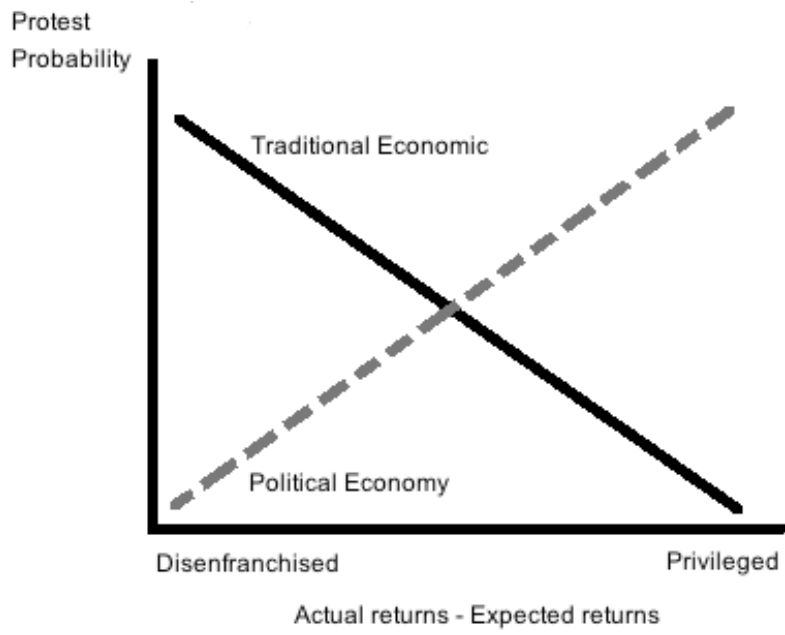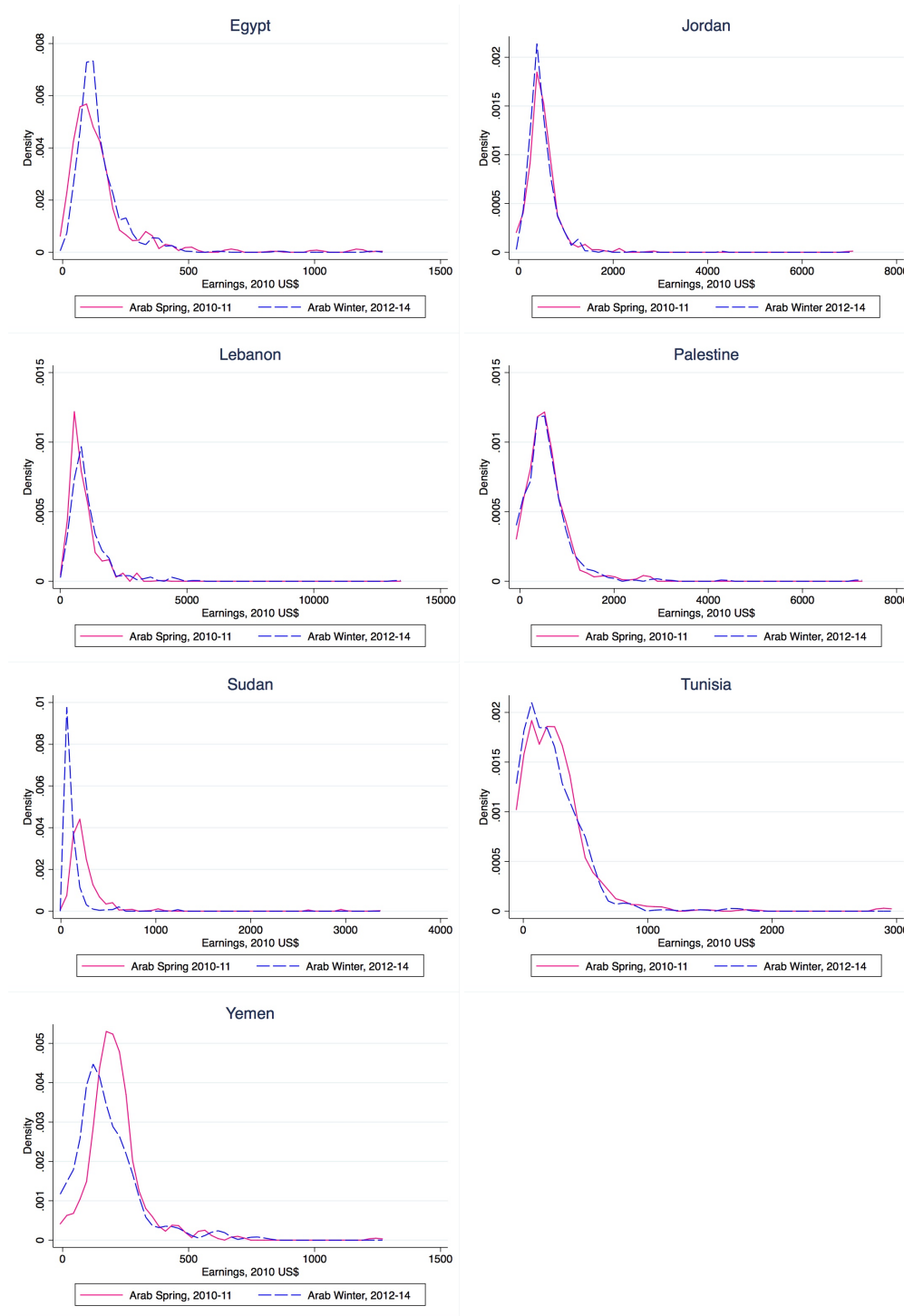
Protest
Probability

Traditional Economic

Political Economy

Disenfranchised   Privileged

Actual returns - Expected returns

Figure 2: Kernel densities of the monthly earnings of male labor force participants during the Arab Spring and Arab Winter