

Why was the Arab World Poised for Revolution? Schooling, Economic Opportunities, and the Arab Spring

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In December 2010, the self-immolation of a Tunisian fruit vendor sparked what has come to be termed the “Arab Spring.” What first appeared as an isolated act of protest against local authorities quickly gained broader significance, as it was followed by a series of demonstrations that has shaken the grip of autocratic regimes across the Arab world. A year later, three longstanding dictators – Zine El Abidine Ben Ali of Tunisia, Hosni Mubarak of Egypt, and Muammar el-Qaddafi of Libya – have been ousted, after varying degrees of violence. Syria, Yemen and Bahrain have all witnessed extensive turmoil, raising serious questions about the legitimacy and survival of their rulers. Elsewhere, the political leaders of Morocco, Algeria and Jordan have also been pressured into enacting reforms to try to assuage public demands.

What underlying long-term conditions set the stage for the Arab Spring? Clearly, the possibilities are manifold. For example, *The Economist’s* (2011a) “shoe-thrower’s index” of the vulnerability of Arab regimes lists many possible determinants of instability: years in power of the incumbent; size of the youth population cohort; democracy, corruption and press freedom; and GDP per capita (as a summary measure of economic performance). In this paper, we do not seek to rule out a contributing role for these and other structural forces that have been proposed; in places, we will acknowledge and comment on some of these other forces. However, we are convinced that education and its connection with the economic environment deserve prominent consideration in any inquiry into the Arab Spring and other similar episodes of political change.

The argument that education positively affects the political development and democratization of nations has a long and venerable vintage (Dewey, 1916; Lipset, 1959, 1960). At a more micro level, a vast body of evidence confirms that individuals with a higher educational attainment consistently exhibit a greater propensity to participate in the full spectrum of political activities, from milder forms of engagement such as voting or discussing politics, to more public forms of mobilization such as

demonstrations.¹ This positive relationship holds true in virtually any survey dataset which asks about political engagement, even after controlling extensively for other individual traits such as age, gender and income. Indeed, Putnam (1995a, p.68) claims with some justification that education is “the best individual-level predictor of political participation.”

But education and economic opportunity can be mismatched. Huntington (1968, p.48) discusses how higher education in many modernizing countries often failed to provide skills that were relevant to the countries’ needs, churning out graduates faster than jobs could be created, and thus leading instead to alienation and instability: “The higher the level of education of the unemployed,... the more extreme the destabilizing behavior which results.” Along similar lines, Davies (1962) famously posited that rising expectations associated with expansions in education could, when left unmet, spill over into political violence, and several observers have highlighted the potential for this combustible mix of conditions in the Arab world (Courbage and Todd, 2007; Noland and Pack, 2007).

Indeed, the Arab world has experienced a remarkable expansion of education in recent decades. Table 1 shows a ranking of countries around the world by the observed increase in average years of schooling in the population aged 15 and over between 1980 and 2010. We use the latest version of the Barro and Lee (2010) dataset, updated in September 2011, which provides quantitative information on educational achievement across 146 countries spanning all inhabited continents. Eight of the top 20 countries as ranked by schooling increases in the general population are members of the Arab League, including notably Tunisia, Egypt, and Libya. A ninth country, Iran, is from the broader Middle East region, and has been the site of a series of mass protests since mid-2009.²

¹ This positive empirical relationship between political participation and schooling has been explored extensively by political scientists and economists, including: Verba and Nie (1987), Rosenstone and Hansen (1993), Putnam (1995b), Verba et al. (1995), Bénabou (2000), Schlozman (2002), Dee (2004), Freeman (2004), Milligan et al. (2004), Hillygus (2005), Glaeser et al. (2007), Sondheimer and Green (2010), and Campante and Chor (2011a). A smaller body of work finds contrary evidence in some instances on the relationship between schooling and voting specifically, but we argue later that this detracts little from our main thesis.

² It may appear odd that Germany ranks so highly on this top 20 list, largely because the Barro-Lee data suggest relatively low levels of schooling attainment in Germany in 1980. On this, Barro and Lee (2001, p.559-560)

We develop our argument by first presenting evidence that this expansion of education in the Arab world was indeed matched with poor labor market prospects, and particularly so in the countries that have been at the heart of the protest wave. We show that this set of conditions is in turn associated with an increased propensity at the individual level towards engaging in political activities of a protest nature, especially among those who have received more education. We then argue that these conditions are useful predictors of political instability and incumbent change at the country level, although we caution that more work is needed to establish the causal nature of this relationship. Finally, we conclude by discussing several potential research directions, as well as the implications of our framework for some ongoing developments and debates. For convenience, we will refer to the Arab world and Middle East interchangeably. Our discussion will include Iran, which is not an Arab League member but largely follows the patterns discussed here. It will however exclude Israel and Turkey, which are geographically in the Middle East but face different economic and political challenges.

Schooling and Economic Opportunities in the Arab World

In recent decades, the Arab region has been characterized by an expansion in schooling coupled with weak labor market conditions. This pattern is especially pronounced in those countries that saw significant upheaval during the first year of the Arab Spring uprisings.

Figure 1 compares the Arab World vis-à-vis the rest of the world along the two respective dimensions of schooling gains and labor market conditions. For ease of visualization, only the Arab League and Iran are labeled by their country names in the scatterplot. In all three panels, the horizontal axis plots the change in average years of schooling between 1980 and 2010 in the general population –

have noted the discrepancy between their estimates, which are based on data from the United Nations Educational, Scientific and Cultural Organization (UNESCO), and other estimates by the Organisation for Economic Co-operation and Development (OECD), which tend to ascribe higher education levels to Germany in past decades. They attribute these differences mostly to the fact that the UNESCO data classified vocational and non-academic educational training, which are very important in Germany, as part of lower levels of schooling.

this is the same variable that was reported in Table 1, calculated from the Barro and Lee (2010) dataset. The Arab countries are generally above the sample median (indicated by the vertical line) in terms of the gains in schooling attainment that they achieved. While many developing countries elsewhere also saw large improvements in schooling during this period, the Arab world had in many cases the advantage of oil revenues that supported the expansion of the education system (Daun and Arjmand, 2002). These data admittedly only provide a rough gauge of educational achievement. For instance, they say nothing about the content of education, and a comparatively high proportion of students' time in Arab countries is devoted to religious studies that may be linked to lower labor market rewards (Daun and Arjmand, 2002). Notwithstanding this caveat, the available data do suggest large gains in human capital in the Arab world.

No correlation is obviously apparent in Figure 1 – nor would we have expected one – but one message that clearly emerges is that the gains in schooling in the Middle East were often not accompanied by abundant labor market opportunities. Figure 1A plots the unemployment rate in the general population averaged over 2005-2009 on the vertical axis, as made available by the World Bank's World Development Indicators. These data are drawn from the International Labor Organization (ILO), which compiles labor market statistics from labor force or household surveys conducted by country authorities around the world. These are convenient as a summary indicator of labor market prospects for a broad sample of countries. However, it should be noted that while the ILO defines the unemployment rate as the share of the labor force that is without work, but is available for and seeking employment, the definitions of what constitutes the labor force and unemployed status can differ from country to country.

Figure 1A confirms that many Middle East countries have experienced unemployment rates above the sample median (horizontal line). Indeed, many of the countries that have seen large-scale protests in the first year of the Arab Spring are in the upper-right quadrant of this figure. Egypt, Tunisia, Yemen, and Iran stand out in this regard, although Morocco and Jordan have also seen

significant though less violent protests. On the other hand, those Middle East countries with the lowest unemployment rates, namely Qatar, Kuwait, and the United Arab Emirates, have seen some rise in political expression (for press coverage, see *Economist*, 2011c), but have not seen mass protests.

A very similar picture emerges when we consider an alternative measure of the state of the labor market in Figure 1B, namely the employment-to-population ratio for the population aged 15 and older, once again averaged over 2005-2009. It measures the share of the population employed in the market production of goods and services. While these data are also taken from the World Development Indicators, and ultimately draw from the same ILO source as the unemployment data, they are potentially less subject to some idiosyncrasies that could distort the accuracy of unemployment rates as a description of labor market conditions. For instance, a country might have a relatively low unemployment rate because individuals drop out of the labor force in response to bleak job prospects. Most of the Middle East countries that have been at the center of violent protests exhibited large schooling gains and poor employment-to-population ratios, appearing in the lower-right quadrant of Figure 1B. In particular, this quadrant now includes Libya, for which the unemployment data were unavailable for Figure 1A. On the other hand, countries such as Qatar and the United Arab Emirates, which remained relatively peaceful amid the ongoing events in nearby countries, once again show up in the quadrant combining large gains in schooling and a relatively healthy labor market.³

The labor market prospects faced by skilled or educated workers in the Arab world appear to be especially weak. Figure 2 presents one such illustration based on the secondary unemployment rate over 2005-2009, namely the percentage of workers with some secondary education who are unemployed.⁴ This variable is analogously plotted against the change between 1980-2010 in the

³ A very similar figure emerges when using the employment-to-population ratio for the male workforce only (also from the World Development Indicators), indicating that our conclusions are not overly driven by the relatively low levels of female participation in labor markets in the Arab world. We also obtained a similar set of scatterplots when using real GDP per capita from the Penn World Tables as an alternative proxy for economic conditions on the vertical axis. Both of these figures are available in the online Appendix.

average years of secondary schooling among those aged 15 and over. A key caveat here is that unemployment data by education status is reported by fewer countries, so that the scatterplot is much sparser; for example, Egypt and Algeria both drop out of the sample. The available data nevertheless provide a picture that is consistent with Figure 1: Protest-prone Tunisia, Iran, and Morocco all saw relatively large increases in secondary schooling, yet had high secondary unemployment rates. Kuwait and the United Arab Emirates on the other hand appear to have been the most successful in the region in providing job opportunities for the secondary-educated, while averting major unrest at the same time.

An alternative approach to assess the labor market rewards for educated individuals would be to examine the prevailing skill premium in Arab countries. On this count, the data from Clemens, Montenegro and Pritchett (2009, Table 2) on immigrant wages in the United States uncover some indirect evidence. For instance, they show that very skilled Egyptians with at least some college-level education who migrated to the United States earned more than 13 times as much as comparable individuals who remained in their home country. While less-skilled Egyptians would also earn more in the United States than their counterparts back home, the premium in their case turns out to be smaller, namely a factor of ten for those with no more than a secondary education. A similar pattern also applies to Yemen, where the corresponding wage factors are eleven and nine for college-educated and secondary-educated immigrants to the U.S. economy, respectively. This pattern is in fact unusual for the sample of countries in Clemens Montenegro, and Pritchett (2009), as the relative premium for immigrants with some tertiary education is often on par or even lower than the premium for immigrants with only some secondary education (relative to counterparts in their countries of origin). This is true in particular for the other two Arab countries in their sample, Morocco and Jordan, which

⁴ The available variable from the ILO actually reports the percentage of the unemployed who have a secondary schooling attainment. To convert this to the percentage of those with some secondary education who are unemployed, we multiply this by the overall unemployment rate, and divide by the percentage of those aged 15 and above with some secondary education (from the Barro-Lee dataset). Data availability issues prevent us from building the same figure for tertiary unemployment rates for a large enough number of countries.

incidentally did not see the Arab Spring boil over to the same degree: College-educated immigrants from Jordan earned a premium that was a factor of 4.15, lower than the corresponding factor of 4.82 for those with some secondary education; in the case of Morocco, the immigrant-premium was essentially the same for both education categories (a factor of two). Egypt and Yemen thus seem to have had particularly unrewarding labor markets for the relatively skilled.

Still on this note, it is especially telling that the Tunisian street vendor, Mohamed Bouazizi, whose act of protest marked the start of the Arab Spring, was himself rumored to be a university graduate. Although this detail about his schooling was apocryphal (Fahim, 2011), the fact that the rumor gained such traction is revealing of the strong current of job-related discontent amongst university graduates in Tunisia. Many observers have since drawn attention to the high unemployment rates that prevail among the increasing ranks of the educated in countries such as Tunisia and Egypt, pinning blame on the overbearing presence of an inefficient, heavily regulated state that crimps the development of independent enterprises and business activity (Ammous and Phelps, 2011; Cassidy, 2011; *The Economist*, 2011b). For example, in the recent World Bank report on “Doing Business in the Arab World” (Doing Business, 2011), the region as a whole ranked only ahead of South Asia and Sub-Saharan Africa on a composite index designed to capture how easy it is for small private firms to do business.⁵

Taken together, these different pieces of information build a narrative that suggests that the combination of rising levels of education and poor job prospects – particularly for the relatively skilled – was present in the Arab world, and particularly so in those countries that have witnessed the Arab Spring in its fullest bloom.

⁵ This average score for the Arab world masks a lot of diversity within the region: Saudi Arabia, Bahrain and the United Arab Emirates were actually among the top 40 countries in the world on this index, with Qatar, Tunisia, and Oman not too far behind. The report also documents a number of positive reforms that have been undertaken by Arab countries in recent years.

The Links to Political Protest

Why would a large expansion in schooling and weak prospects for the workforce open the door to political instability? A very robust and widespread body of empirical evidence has shown that individuals with higher educational attainment are more likely to engage in all types of political acts – whether because education increases awareness of political issues, fosters the socialization needed for effective political activity, or generally increases so-called civic skills (for example, Brady et al., 1995; Glaeser, Ponzetto and Shleifer, 2007). Indeed, evidence from randomized and quasi-experimental settings (such as Sondheimer and Green, 2010), as well as from instrumental variables approaches (such as Milligan, Moretti and Oreopoulos, 2004), suggest that the relationship from more education to greater political involvement is likely to be causal.

We believe that the attractiveness of the labor market returns for the skills acquired through education will influence the extent to which education would also raise one's participation in political activities. In Campante and Chor (2011a), we flesh out a formal framework for understanding why this would be the case. Suppose that the skills and human capital acquired through education are useful both in production and political activities. In this setting, an economic environment in which human capital is more valuable in production will also be one where individuals are less likely to direct their human capital towards political participation, given the higher opportunity cost of the production income from labor markets that would be foregone. This tradeoff should be especially acute for those forms of political engagement that are effort-intensive, and so the economic environment should have a larger effect on the propensity to devote one's human capital to labor-intensive activities like public protests as compared to less labor-intensive acts like voting. In addition, weak economic conditions that affect all workers' incomes proportionately should lead to a relatively larger response in political participation from more educated individuals, given the higher value of the foregone income that such individuals should in principle command. In fact, the importance of the opportunity cost of political

activity has been used in a number of ways in the literature. For example, it has been emphasized in the study of regime transitions (Acemoglu and Robinson, 2001, 2005; Brückner and Ciccone, 2011), civil wars (Grossman, 1991; Collier and Hoeffler, 2004), and political violence in general (Besley and Persson, 2011).

In the years leading up to the events of the Arab Spring, the expansion of schooling in the Arab world increased the pool of individuals who had completed primary and attained some secondary schooling (and beyond), but who had not seen that education rewarded in the labor market. The low opportunity cost of political participation would thus make such individuals more likely to instead channel their efforts towards political action, and political protest in particular. We can explore this prediction using response data from the World Values Survey, a comprehensive study on socio-cultural and political attitudes conducted periodically around the world. We draw on the most recent complete wave of this survey, which was conducted from 2005-2007. Several questions in the survey pertain to one's propensity to engage in a number of different political activities, including "attending lawful demonstrations" (question E026). The response options to this question are "Would never do," "Might do," or "Have done," which we coded respectively as 0, 1, and 2 to provide a score of an individual's self-reported propensity towards this effort-intensive form of political participation. We took a simple average of this individual score for those respondents in each country who reported having at least some secondary education (usually numbering several hundred per country).⁶ We focus specifically on these respondents, because our argument implies that country differences in the propensity to demonstrate should be even starker for individuals with higher levels of education. It is unlikely, after all, that primary education focused on basic literacy and numeracy would have the same effect on political involvement as the teaching of critical thinking skills in secondary and tertiary schooling. We were able to compute this country score for only 40 countries, admittedly a relatively small number.

⁶ This corresponds to individuals who reported at least a 3 on the World Values Survey eight-point scale of education status.

Figure 3 compares the average country scores within each of the quadrants of Figure 1A: that is, grouping countries according to whether they are above or below the world median in terms of schooling gains and the unemployment rate. Figure 3A shows that there is a higher average propensity to attend lawful demonstrations in countries that were above the median in terms of the increase in years of schooling. Most notably, this difference is entirely driven by the subgroup of countries that also saw relatively high unemployment rates. In short, greater gains in education at the country level appear to be associated with a stronger individual propensity towards protest activities, but much more so when they are combined with poor labor market conditions.

On the other hand, a less distinct pattern emerges when we consider a form of political activity that is less effort-intensive, namely voting. Voting has been described as “the only political act requiring relatively little initiative” (Verba and Nie, 1987, p.77), as well as being the least demanding in terms of civic skills (Brady et al., 1995). Figure 3B reproduces the above exercise using instead the response to a binary voting variable from the World Values Survey (question E257) – whether the individual voted in the most recent parliamentary election – to compute the country political participation score. The interaction between education and economic circumstances does not appear to operate as clearly in promoting this form of political activity, which is consistent with the lower opportunity cost of time and effort associated with voting.

Of course, the illustrative presentation of the data patterns here is only a starting point, but we have explored these patterns of political participation more formally using data from the World Values Survey and the Comparative Study of Electoral Systems in Campante and Chor (2011a). For example, in countries well-endowed with resources that are likely to decrease the relative returns to human capital in production – for example, resources such as land that are associated with less skill-intensive activities – the positive correlation between education and participation at the individual level was stronger precisely in effort-intensive political activities such as attending demonstrations or occupying buildings. At a more micro level, we also found that individuals who worked in unskilled or manual

occupations showed a greater propensity than those in skilled occupations to devote any incremental human capital towards political activities.⁷ In Campante and Chor (2011b), we have undertaken a more rigorous empirical exploration of these ideas using the full individual-level data in the World Values Survey. We found that while more educated individuals are more likely to engage in political acts such as demonstrations, boycotts and strikes, this link between education and political protest is stronger among those individuals who underperform in the labor market. To be specific, we constructed a measure of income underperformance as the extent to which an individual's reported income status falls below that predicted by a regression model based on a comprehensive set of observable characteristics for the individual, including importantly their level of schooling. We further verified that many of the Arab countries present in the World Values Survey also tended to display very high average levels of income underperformance for individuals who have some secondary education. In fact, Morocco, Iraq, Jordan, Egypt, and Algeria were among the worst-ranked countries on this count when compared with the rest of the world.

At this juncture, we should distinguish our argument from the long line of thought that has held that "grievances" can provide the fuel for demonstrations. For instance, Opp (1988) links grievances to participation in social movements, and Verba et al. (1987, p.161) argue that a "group [that is] particularly motivated by a sense of grievance vis-à-vis other groups... may become much more active than its socioeconomic level would predict." Such "grievance" effects driven by economic frustration were certainly present during the Arab Spring. Take for example the results of a poll conducted by the International Republican Institute (IRI) in Egypt in April 2011, shortly after the resignation of President Mubarak. Out of the 28 percent of respondents who claimed that they had taken part in the recent protests, 64 percent cited "low living standards / lack of jobs" as their primary motivation, far above the 19 percent who mentioned "lack of democracy and political reform" (IRI, 2011). Indeed, 41

⁷ In a similar vein, Charles and Stephens (2011) provide evidence that positive labor market shocks tend to reduce voter turnout in local U.S. elections. They attribute this finding to the increased opportunity cost of using one's time to pay attention to and gather information on political developments related to municipal issues, which tend to receive less media coverage than national issues.

percent of the respondents indicated that they “have trouble feeding [themselves] and [their] family and buying even the most essential things for survival.”

We certainly do not discount the importance of the pure “grievance” effect. Nevertheless, we would argue that it becomes difficult to explain the patterns in the data fully if we do not complement a grievance-based explanation with the opportunity cost effect that we emphasize. After all, one could envision that the public could be angry at the economic situation but apathetic, particularly if the time and effort cost of engaging in political action is too high. In our interpretation, individuals would be more prone to devote their energies to political protest not only because they are aggrieved, but also because it is less costly to do so when labor market conditions are weak. Thus, one can now explain why those with more schooling are more likely to react to poor economic conditions through effort-intensive forms of political participation, without having to assume that the grievance motive somehow has more traction with the highly educated.

From a broader perspective, the opportunity cost argument also helps us to make sense of some evidence that leans against the mainstream finding of a positive impact of schooling on political participation at the individual level. Several papers have reported finding a small or even insignificant causal effect of education (for example, Tenn, 2007; Kam and Palmer, 2008; Berinsky and Lenz, 2010). There is also some evidence that this correlation is considerably weaker in low-income countries (Pande, 2011). However, all of these exceptions have to do with voting, a relatively less effort-intensive activity for which we would expect the opportunity cost forces to be weaker. Such findings underscore the need to distinguish between different forms of political engagement, which are quite possibly affected by the economic and institutional environment in different ways.

All in all, we have offered suggestive evidence that the combination of education and unrewarding economic circumstances is associated with an increased propensity towards political protest. Since we have also argued that the Arab world indeed witnessed both substantial investment in

education and poor labor market conditions, it is plausible to think that this combination was important as a root cause of the Arab Spring.

Of course, a number of other structural forces have been mentioned in connection with the Middle East turmoil, and it is useful to acknowledge these and how they might complement our framework. In particular, the youthful demographic profile of the affected countries has featured prominently in these discussions, motivated by the evidence, from casual observation and from political scientists like Urdal (2006), that youth are more prone to acts of political protest or violence. We briefly explore this “youth hypothesis” in Figure 4. The upper panel plots the change in the share of the population aged 15-24 (out of the population aged 15 and over) from the Barro and Lee (2010) dataset on the horizontal axis. A quick look at this figure reveals that Syria, Egypt, Yemen and Iran did see a large increase in this youth cohort share from 1980 to 2010. On the other hand, countries like Tunisia, Jordan, Algeria, and Morocco actually experienced fairly large declines in the relative size of this youth cohort during this period.

The picture changes considerably however if we focus on the share of the population aged 25-39 instead. Figure 4B illustrates that all the countries that were affected by significant uprisings during the Arab Spring were also places where the share of the population aged 25-39 had increased considerably from 1980 to 2010, amid a labor market climate featuring high unemployment rates. It thus seems that the demographic shifts in this “not-so-young” age cohort might actually be more relevant for the recent Arab experience. It is perhaps no coincidence that the age 25-39 cohort consists of young workers entering the prime of their working age years, whose political behavior would be more liable to respond to prevailing conditions in the labor market. In other words, Figure 4B suggests that the “youth hypothesis” refers most fully to younger members of the workforce with poor economic prospects who are particularly inclined to revolt. We view this as entirely consistent with the opportunity cost mechanism we emphasize.

Links to Political Change

Even if education and poor economic rewards tend to be correlated with a greater propensity towards protest activities at the individual level, it does not follow immediately that, at the aggregate level, they would be associated with political change. Of course, it is not enough to point to the Arab Spring as vindication: Why then did the Middle East experience this sudden wave of uprisings, but not other countries with similar structural conditions? In other words, why have the other countries in the upper-right quadrant of Figure 1A not gone through their own “springtime”? Perhaps they will in the future, but more generally it seems plausible that revolutionary episodes are not deterministic processes, so their occurrence might not even be guaranteed, even in relatively favorable conditions.

Can we nevertheless say something more systematic about how the interaction of increased education and economic circumstances affects the probability of episodes of political change? To take a stab at these questions, we use a measure of political change that we have built based on turnover data on country leaders compiled from Worldstatesmen.org, an encyclopedia that provides detailed chronologies of heads of state and heads of government around the world.⁸ We construct a binary indicator for whether there is any change in the chief executive running the country during a given five-year window, namely 1990-1994, 1995-1999, and so on. Note that, for this variable, we do not distinguish between changes that are brought about by peaceful democratic processes or violent revolutions, although we will return to a discussion on this issue later below. We estimate probit regressions on this indicator of executive change, where the key explanatory variables are the same measures of the unemployment rate and the change in the average years of schooling that we have already been using. Due to how sparse the unemployment data become across countries as we go further back in time, we focus our analysis on the period between 1990 and 2009, taking averages of

⁸ To guard against concerns that might be raised over the open-source nature of the website, we have compared the records in WorldStatesmen.org against other data sources as a cross-check for the years in which political transitions occurred. See Campante et al. (2009) for more details.

the unemployment rate over each five-year window. (For the change in schooling variable, we calculate this for the 1990-1994 observation as the difference in average years of schooling between 1985 and 1990, and so on.) Given the panel nature of our approach, we include country and time dummies in our regressions, while also clustering the standard errors by country. The country fixed effects in particular are useful for controlling for omitted variables such as social or even geographical features. One might suspect for instance that the concentration of Sunnis, or whether a country is a Gulf versus non-Gulf state, might otherwise be correlated with a country's investment in education or its unemployment rate.

Table 2 contains the results of this exercise. The first column shows that the incidence of executive change is positively correlated with the unemployment rate; on the other hand, its correlation with changes in years of schooling is statistically insignificant. The second column uncovers how a combination of schooling increases and weak labor markets is associated with a greater likelihood of incumbent change: the coefficient of the interaction term between the change in average years of schooling and the unemployment rate is positive and significant at the 1 percent level. In column 3, we incorporate variables that would help to account for the possible role of a youthful demography in driving political change, specifically by controlling for the lagged five-year change in the share of the population aged 15-24, as well as its interaction with the prevailing unemployment rate. We find evidence here that the role of schooling increases is indeed statistically robust to and distinct from the "youth hypothesis," at least when the latter is represented by the age 15-24 cohort. Our central findings do seem to be complemented though by the change in the population cohort share that is aged 25-39, as shown in column 4. Countries which saw large increases in the size of this "not-so-young" cohort, amid a labor market with a high unemployment rate, are in turn more liable to experience a change in political leadership. This in fact augments the role of the underlying expansion of schooling, as the significance of the interaction of this previous term with the unemployment rate remains significant. Overall, we view this as consistent with the idea that the opportunity cost in labor markets helps to

explain the patterns in the political turnover data, as this slightly older cohort should be most active in labor markets and not obviously more (or less) likely to hold grievances.

While we would refrain from placing too much emphasis on the specific numbers from these illustrative regressions, the lesson we draw is that our story of interest can be quite important and useful for predicting the likelihood of turnover.⁹ These implications for regime stability are explored further and more formally in a cross-country regression framework in Campante and Chor (2011b).

As previously mentioned, our cross-country analysis does not distinguish between the means by which regime change was triggered, in part to avoid having to make arbitrary choices regarding what constitutes an instance of turnover driven by a revolution. We would moreover argue that our mechanism applies just as well to a situation where an incumbent might be brought down within an existing democratic framework, as a result of political pressure from mass demonstrations or strikes. Having said this, the Middle East countries do differ significantly from the other countries in the upper-right quadrant of Figure 1A on one key dimension: democracy. To illustrate this, we use the Polity IV database, which gives countries a “Democracy” score on a 0-to-10 scale, based on the assessment of a list of institutional features meant to capture the characteristics of a well-functioning democracy (Marshall and Jaggers, 2011). The data are available on a yearly basis, and for each country in the upper-right quadrant of Figure 1A, we compute an average 2005-2009 score. As it turns out, the average score for the non-Middle East countries in that quadrant is around 8.3, in contrast with a Middle East average of 1.1. In other words, one dimension that sets the Middle East countries apart is that they are highly non-democratic when compared with the other countries in that quadrant. One interpretation is thus that in the absence of democratic mechanisms for regime change, the societal pressures that had been building up in the Middle East against incumbents were pent up and eventually

⁹ In terms of the quantitative implications of this probit model, the column 4 estimates suggest that a one standard deviation increase in the unemployment rate (roughly six percentage points for the countries in the sample in 2005-2009) would be associated with an increase in the probability of turnover of about 36 percent. About seven-tenths of this increase can be attributed to the main effect of the unemployment rate alone, with the remaining three-tenths due to the interaction of the unemployment rate with increases in schooling. (We evaluate all other country variables at their mean values in 2005-2009.)

found expression in popular outbursts of protest. Alternatively, those pressures exerted by the combination of schooling increases and poor economic circumstances might have found a more peaceful resolution within the democratic institutional framework in other countries, through for example the removal of incumbents via the electoral process.

This interpretation does receive some support from the data on incumbent changes. Of the 19 non-Middle East countries in the upper-right quadrant of Figure 1A, 13 had experienced at least one change in the identity of the chief executive between 2005 and 2009. In contrast, among the eight Middle East countries in that quadrant, only two saw a change, namely Iran and Iraq – and of course, Iraq is a peculiar case associated with a transition away from a foreign intervening power. Moreover, there is only one non-Middle East country, Kazakhstan, in this high-unemployment, high-schooling gains quadrant, which also shares a similarly low democracy score as the Middle East. While we would refrain from making overconfident predictions, we would not be shocked to see some political instability in Kazakhstan in the not-too-distant future.

What Can We Hope To Learn?

We have argued that the lack of adequate economic opportunities for an increasingly educated populace can help us understand episodes of regime instability such as the Arab Spring. Our work in this area can be viewed in the context of the long-running debate over the “modernization hypothesis.” In the classic view put forth by Lipset (1960), economic and institutional development tend to go hand in hand, and so “modernization” – including the expansion of education – naturally begets democracy. In an alternative view memorably put forward by Huntington (1968), modernization can instead be destabilizing in the absence of the necessary institutional infrastructure to support the process of change. Przeworski and Limongi (1997) survey and assess this extensive literature.

The major difficulty in distinguishing between these two camps has been empirical in nature. Cross-country studies generally confirm the strong positive raw correlation linking education and democracy (for example, Barro, 1999; Przeworski et al., 2000). However, the empirical work has struggled to show a clear causal effect from within-country increases in schooling to improvements in democracy. For example, Glaeser et al. (2004) find Lipsetian results, while Acemoglu et al. (2009) argue that these findings are spurious, in that they are driven by the joint increase over the years of both education and the spread of democracy across rather than within countries.¹⁰

Our approach seeks to break down the broader theories about modernization into more specific underlying mechanisms: in our case, the interaction between the schooling background and economic circumstances faced by individuals. We have focused on how economic circumstances affect the opportunity cost of political participation, but other mechanisms are certainly possible. In one recent example, Friedman et al. (2011) have explored how schooling affects political views and attitudes, through a randomized field experiment in Kenya that increased individual schooling levels via the assignment of merit scholarships. Their results point at increased knowledge within the treatment group, but also a greater disenchantment with politics and (perhaps surprisingly) a greater acceptance of political violence. Another approach looks at what is taught and how. Algan, Cahuc and Shleifer (2011) find that different teaching methods – for example, group discussion versus lecturing – seem to influence students' views and beliefs.

Our broader thesis may also apply beyond the Middle East. For instance, several observers have pointed to China as an example of a developing country that has recently seen an increased scarcity of job opportunities for university graduates, against the backdrop of a rapid expansion of the tertiary education sector in the past decade (Jacobs, 2010; Eichengreen, 2011). Our interpretation of recent events in the Arab world reinforces the view that China may well face a rise in political

¹⁰ Bobba and Coviello (2007) offer an econometric perspective on this debate. A similar challenge has emerged when it comes to the closely-related problem of establishing a causal effect flowing from income growth to democratization (Acemoglu et al., 2008, 2009). Moral-Benito and Bartolucci (2011) argue that there is evidence for a non-linear effect, namely that rising income fosters democracy, but only up to a certain level of income.

instability, if the Chinese economy does not sustain a pace of growth that generates sufficient jobs to keep up with the education profile of its population. All in all, the connections between education, the economic environment, individual political engagement, and institutional change will most certainly continue to play a large role in driving political developments and dynamics in the years to come.

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Table 1
Increases in Schooling Attainment across the World
(Top 20 countries, 1980-2010)

Country	Years of schooling, 1980	Years of schooling, 2010	Increase in years of schooling
1. Botswana	3.12	9.56	6.44
2. Germany	5.61	11.82	6.21
3. Iran	3.34	8.59	5.25
4. Algeria	3.06	8.30	5.24
5. United Arab Emirates	3.88	9.12	5.23
6. Gabon	3.33	8.35	5.02
7. Brazil	2.77	7.54	4.77
8. Bahrain	4.92	9.59	4.67
9. Jordan	4.58	9.23	4.65
10. Libya	3.26	7.85	4.59
11. France	5.96	10.53	4.58
12. Malaysia	5.69	10.14	4.46
13. Bolivia	5.47	9.91	4.44
14. Egypt	2.65	7.08	4.43
15. El Salvador	3.58	7.97	4.39
16. Mexico	4.89	9.11	4.22
17. Spain	6.17	10.38	4.22
18. Saudi Arabia	4.38	8.48	4.10
19. Tunisia	3.25	7.32	4.07
20. Latvia	6.69	10.60	3.91

Notes: Calculated from the Barro-Lee dataset (2010, version 1.2), based on the average total years of schooling in the population aged 15 and above. Arab League and Iran are in bold.

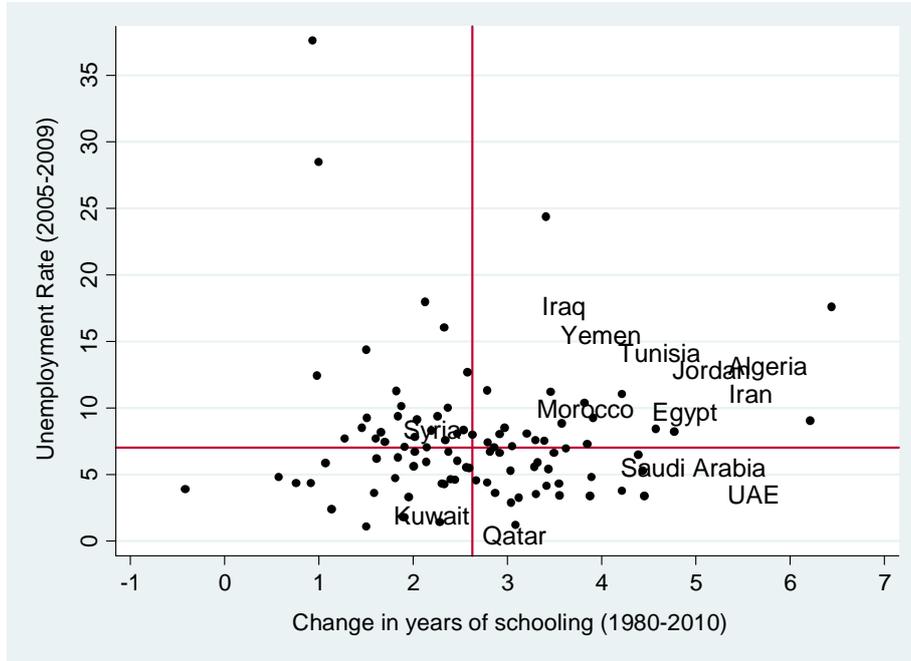
Table 2
Labor Market Conditions and Schooling Gains: Implications for Incumbent Stability

Dependent Variable:	Probit Regressions			
Change in Executive (1= Yes, 0=No)	(1)	(2)	(3)	(4)
Unemployment Rate	0.086** (0.037)	0.044 (0.041)	0.041 (0.041)	0.082* (0.048)
Change in years of schooling	0.023 (0.411)	-1.448** (0.586)	-1.440** (0.582)	-1.298** (0.581)
Unemployment Rate X Change in years of schooling		0.130*** (0.043)	0.129*** (0.043)	0.105** (0.047)
Change in Pop. Share 15-24			0.055 (0.124)	-0.113 (0.166)
Unemployment Rate X Change in Pop. Share 15-24			-0.005 (0.010)	0.018 (0.014)
Change in Pop. Share 25-39				-0.207 (0.148)
Unemployment Rate X Change in Pop. Share 25-39				0.029** (0.013)
Country dummies?	Yes	Yes	Yes	Yes
Year dummies?	Yes	Yes	Yes	Yes
Observations	274	274	274	274
Number of countries	70	70	70	70
Pseudo R-squared	0.132	0.155	0.156	0.167

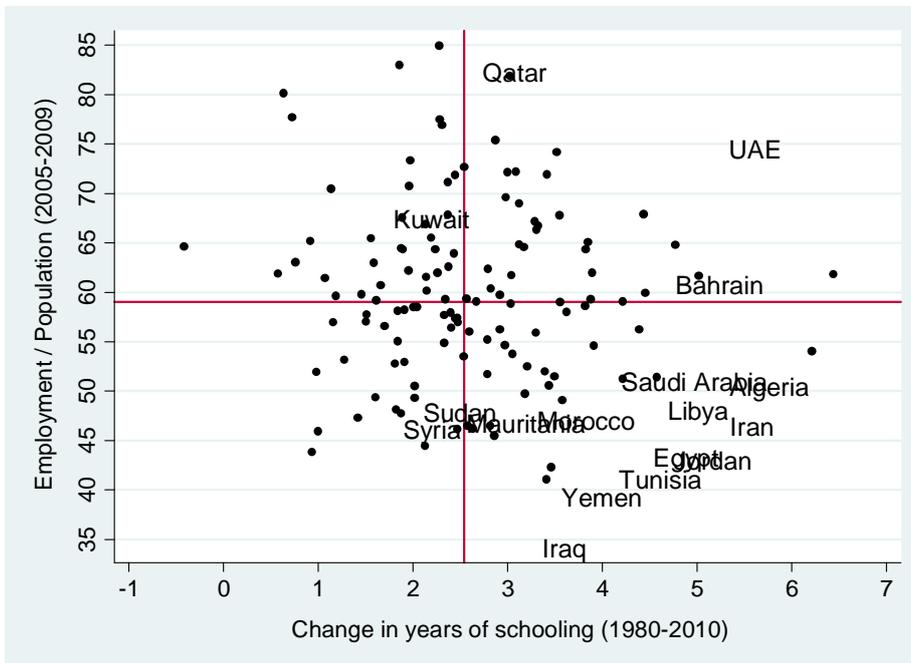
Notes: ***, **, and * denote significance at the 1%, 5%, and 10% levels respectively. Standard errors in parentheses are clustered by country. All columns are probit regressions with country and year fixed effects. The data used run from 1990-2009. Observations are constructed for five-year windows, for example 1990-1994. The dependent variable is a binary variable indicating the occurrence of a change in the chief executive governing the country during a given five-year window. The unemployment rate is the average over the five years. The change in years of schooling and change in population shares are calculated as the value observed at the start of the window minus that observed at the start of the preceding five-year window (for 1990-1994, this is the 1990 value minus the 1985 value).

Figure 1
Where the Arab Countries Stand:
Labor Market Conditions against Schooling Investments

A. Unemployment Rate (% of Labor Force)

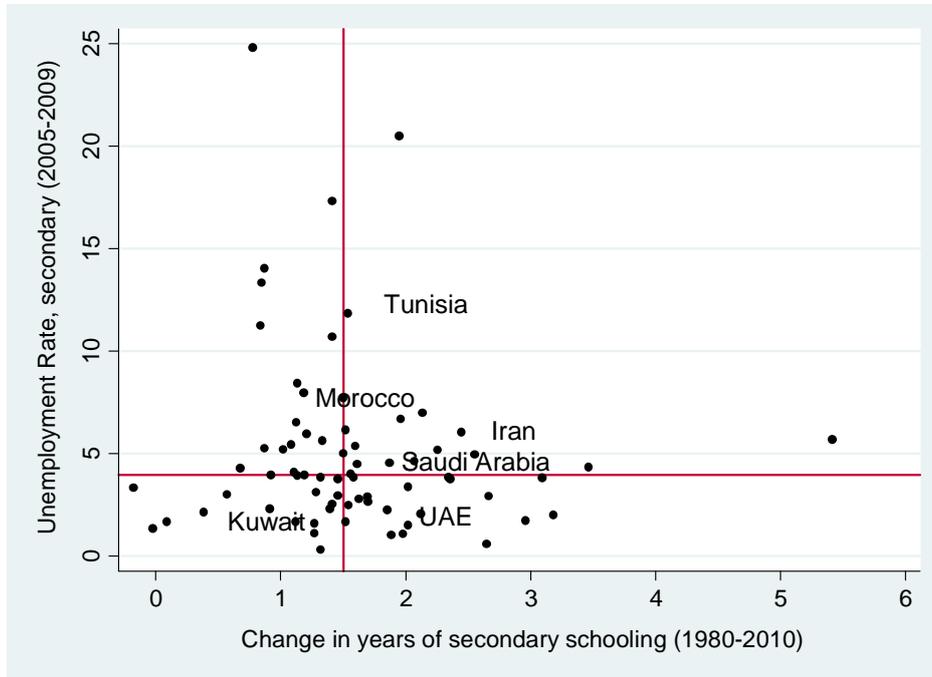


B. Employment to Population Ratio (Age >=15)



Notes: Arab League countries and Iran are labeled by their country names, while all other countries are indicated by circular markers. The x-axis plots the change in years of schooling in the general population aged 15 and over, between 1980-2010. For the y-axis, Panel A plots the unemployment rate in the total labor force, while Panel B plots the employment-to-population ratio for the general population aged 15 and over. All labor market variables are averaged over 2005-2009. Lines indicating the median values of the x- and y-axis variables are included.

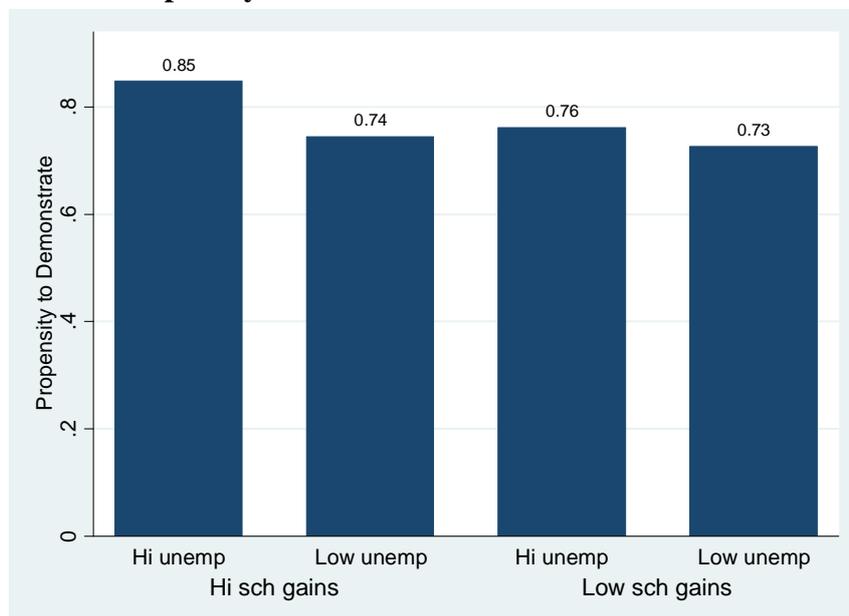
Figure 2
Where the Arab Countries Stand:
Unemployment Rates against Secondary Schooling Investments



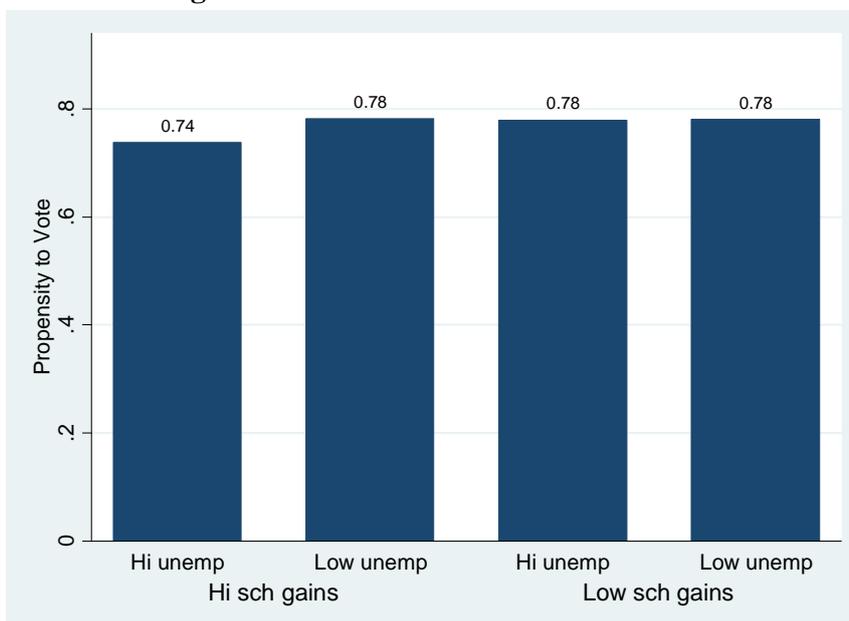
Notes: Arab League countries and Iran are labeled by their country names, while all other countries are indicated by circular markers. The x-axis plots the change in years of secondary schooling in the general population aged 15 and over, between 1980-2010. The y-axis plots the unemployment rate among workers with some secondary education, averaged over 2005-2009 (calculation described in the main text). Lines indicating the median values of the x- and y-axis variables are included.

Figure 3
Individual Engagement in Political Activities across Different Sets of Countries
(Restricted to Individuals with at least some Secondary Education)

A. Propensity to Demonstrate



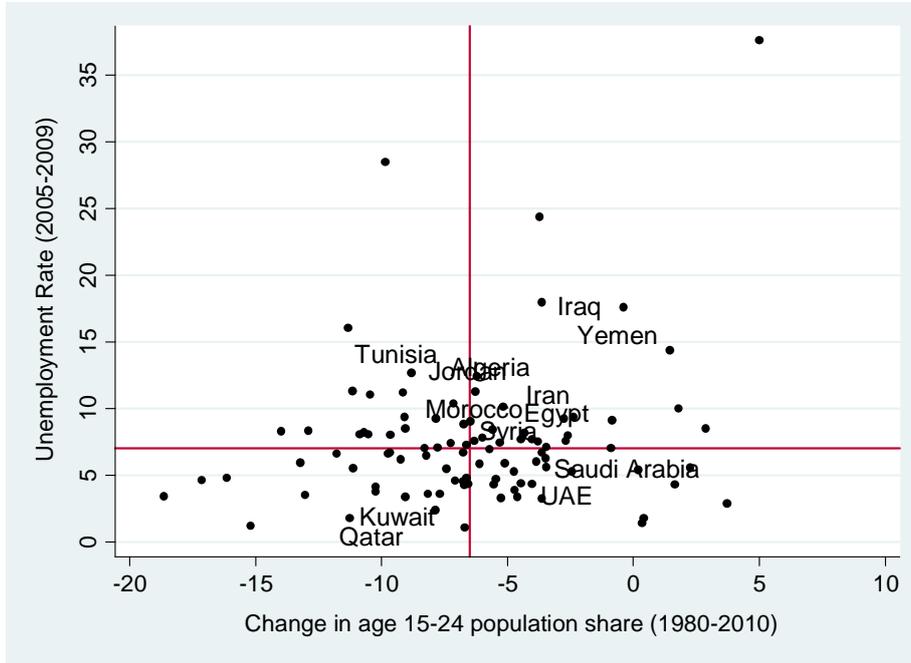
B. Voting



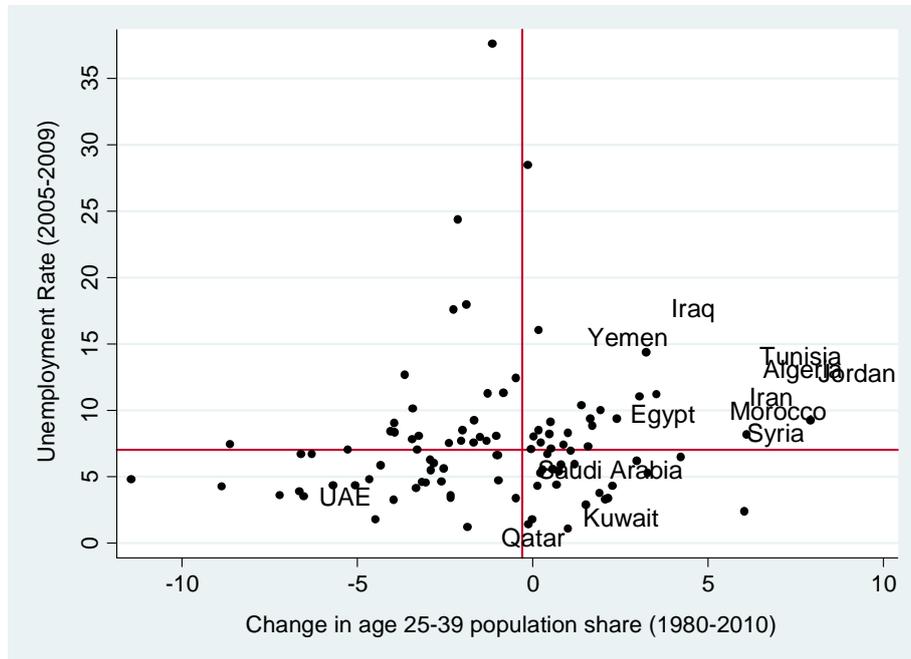
Notes: The propensity to demonstrate scores in Panel A are calculated from Wave 5 of the World Values Survey, averaged over individuals in each country to obtain a country score. The range of values of this score is from 0 to 2. The propensity to vote in Panel B is calculated from a binary variable on participation in voting from Wave 5 of the World Values Survey, averaged over individuals in each country to obtain a country score. The range of values of this variable is from 0 to 1. All country scores are calculated using only individuals with some secondary education (at least 3 on the Survey’s 8 point scale of education status). The columns in each panel report the mean country scores as grouped by the four quadrants in Figure 1A, namely: above/below the median unemployment rate and above/below the median change in schooling years.

Figure 4
Was it the Youth Revolution?
Unemployment Rates against the Population Shares of Young Cohorts

A. Unemployment Rate against the Change in Population Share (Age 15-24)



B. Unemployment Rate against the Change in Population Share (Age 25-39)



Notes: Arab League countries and Iran are labeled by their country names, while all other countries are indicated by circular markers. The y-axis plots the unemployment rate in the total labor force, averaged over 2005-2009. For the x-axis, Panel A plots the change in the population share aged 15-24 (as a share of that aged 15 and over), while Panel B plots the change in the population share aged 25-39 (as a share of that aged 15 and over). Both population share changes are calculated from 1980-2010. Lines indicating the median values of the x- and y-axis variables are included.