



Working Paper Proceedings

Engineering Project Organization Conference

Cle Elum, Washington, USA

June 28-30, 2016

How Revolutions Shape (or Rather Blur) Markets: Initial Insights from the Arab Spring

Daniel Armanios, Carnegie Mellon University, USA

Amr Adly, American University of Cairo, Egypt

Proceedings Editors

Jessica Kaminsky, University of Washington and Vedran Zerjav, University College London



© Copyright belongs to the authors. All rights reserved. Please contact authors for citation details.

HOW REVOLUTIONS SHAPE (OR RATHER BLUR) MARKETS: INITIAL INSIGHTS FROM THE ARAB SPRING

Daniel Armanios¹ and Amr Adly²

ABSTRACT

How do revolutions shape markets? Prior social movement research has focused on those movements that seek to work with the existing state to change markets. Yet, revolutions are a unique outcome of social movement activity that seeks to create change through removing, rather than working with, the existing state. Using novel sampling methodology to construct a unique dataset of both Tunisian and Egyptian entrepreneurs just after the Arab Spring, we find that because revolutions seek to disrupt the state, they delegitimize formal firms (i.e. those registered with the state) and legitimize informal firms (i.e. those unregistered with the state). In so doing, revolutions improve the ability of informal firms to access resources from formal state financial institutions. Moreover, any firms that have a structure similar to that of informal firms (i.e. sole proprietorships) also have an easier time accessing these formal state resources after the revolution, irrespective of their registration status. This study contributes to the social movements literature, particularly as it relates to markets and the state.

KEYWORDS: Revolutions, Informality, Middle East, State, Institutional Infrastructure

INTRODUCTION

Social movements, and the organizations that underpin them (McCarthy and Zald 1977, Fligstein and McAdam 2012), can change what is deemed as acceptable market activity (Schneiberg and Soule 2005, Haveman, Rao, and Paruchuri 2007). For example, in influencing governments to ban alcohol consumption, the women's temperance movement provided opportunities to found other, more movement-sanctioned beverage alternatives such as carbonated beverages (Hiatt, Sine, and Tolbert 2009). Social movements can also make acceptable novel ways of doing business that were previously considered risky. For example, organizations such as the Sierra Club that were part of the environmental movement that helped increase the founding of risky technology ventures such as those in wind (Sine and Lee 2009). Non-profit organizations that were part of the microradio movement helped increase the founding of low-power FM ventures that appealed to more niche clientele and could not get bandwidth previously (Greve, Pozner, and Rao 2006). Overall, social movements can directly affect markets because they change the norms of what is considered acceptable market activity.

How then do revolutions shape markets? We are yet unable to adequately answer this question because the prior research that analyzes how social movements shape markets focus on movements that aim to work within the state apparatus to change market norms. In other words, these movements view the state as a "fulcrum" to realize their interests (Amenta et al. 2010, Hiatt, Grandy, and Lee 2015). However, revolutions result from social movement actions that aim to transform, rather than work with, the existing state (Skocpol 1979, Goldstone 2001). Because

¹ Assistant Professor, Department of Engineering and Public Policy, Carnegie Mellon University, Pittsburgh, PA, USA darmanios@cmu.edu

² Visiting Scholar, Department of Political Science, American University of Cairo, Carnegie Middle East Center, Cairo, Egypt, amradly82@aucegypt.edu

revolutions aim to change the state, rather than leverage it, understanding how revolutions shape markets can advance our theoretical understanding of how social movements shape markets.

To gain initial insight into how revolution shape markets, we developed a novel sampling methodology, which we term “site-based sampling with penalty”, to gather unique data of formal (i.e. state registered) and informal (i.e. unregistered) entrepreneurs in Tunisia and Egypt just after the Arab Spring. Specifically, we look at how entrepreneurs acquire startup capital to operate in these countries and how their sources for startup capital change before and after the onset of the revolution. As our interest is to explore the role of revolutions on markets, we chose to focus on entrepreneurial ventures as their internal structure is more permeable to external forces than are those of more established firms (Stinchcombe 1965). Given that, entrepreneurial ventures are the most susceptible to social forces such as a revolution, which allows us to better isolate the role of revolutions on markets, independent of firm structure.

We feel our study makes several advancements to the literature on social movements, particularly as it relates to market structure, the state, and entrepreneurship. First, we document how revolutions that question the legitimacy of the state and, thus disrupt the state’s regulative capacity, can affect market activity. Prior research in social movements shows how movements can shape markets through their influence on the state. In these instances, these movements view the state as a means through which to realize its aims (Amenta et al. 2010, Hiatt, Grandy, and Lee 2015). However, our study shows that revolutions are unique in their effects on markets because they arise when the populace rejects current state authority. Revolutionaries see the state as the key obstacle, rather than the key fulcrum, to realizing their aims. Second, we show that because revolutions undermine the state’s ability to set market rules, they *blur* the line between the formal and informal elements of a market. Prior research explores social movements that promote entrepreneurship by changing what is considered as acceptable in markets (Greve, Pozner, and Rao 2006, Haveman, Rao, and Paruchuri 2007, Hiatt, Sine, and Tolbert 2009, Sine and Lee 2009). In showing that revolutions blur the line between the formal and informal sectors of a market, revolutions not only change market norms, they make setting *any* such norm difficult. Finally, we show that revolutions generates gaps in a state’s chain of command such that state regulatory bodies have trouble not just regulating markets but its own institutions. Because prior research in social movements particularly focuses on how movements influence state regulations (Hiatt, Sine, and Tolbert 2009, Schneiberg and Soule 2005), there is perceived alignment between state regulatory bodies and those state institutions responsible for supplying the necessary resources to undergird such regulations. We show that revolution undermines the state regulative capacity, which generates misalignment rather than alignment, between state regulatory bodies and those state institutions that allocate state resources. Overall, we employ a novel methodology for studying “environmental jolts” (Meyer 1982, p. 516-517), which allows us the rare opportunity to better understand a “system in flux” due to revolution (Meyer, Gaba, and Colwell 2005, point #4, p. 471).

THEORY AND HYPOTHESES

Revolutions and Market Structure

Because revolutions transform how states operate (Goldstone 2001, Skocpol 1979), such a transformation is also likely to change how states exert influence on markets (Fligstein 1996). In particular, when revolutions effectively arise and disrupt the state’s capacity to regulate markets, they delegitimize the state’s role in markets. In so doing, revolutions do not just change what states

consider as acceptable market behavior; they undermine the very regulative capacity of the state to enforce *any* market boundary at all.

With the state being delegitimized and unable to enforce any market boundary, revolutions *blur* the lines between what is informal and formal in a market. While there are numerous definitions as to what is formal and informal, they all generally tend to agree with “the notion of informal as being outside the reach of different levels and mechanisms of official governance and formal as being reachable by these mechanisms (Guha-Khasnabis, Kanbur, and Ostrom 2006, p. 4).” As such, firms registered with the state are considered more formal, while firms unregistered with the state are considered more informal. As revolutions question the state’s credibility, so too do they question the legitimacy of those registered firms that sought the state’s compliance. In so doing, formal firms that were previously legitimate are now seen as illegitimate because the credibility of the state to approve firm activities is now questioned. Informal firms that were previously seen as illegitimate are now seen as legitimate as these firms did not seek to comply with state requirements. As such, revolutionaries are likely to see these firms as more legitimate as unregistered firms are also seen as not accepting the norms that the government put forth to gain their approval (El-Mahdi 2006). In other words, formal firms that once benefitted from state legitimacy now suffer from an “illegitimacy discount” as the revolution discredits the state (Zuckerman 1999).

The consequences of this reversal in legitimacy (i.e. formal firms becoming illegitimate and informal firms becoming legitimate) is that formal firms may have more difficulty accessing formal resources (i.e. resources from state financial institutions such as state-owned banks). On the other hand, firms that were not formally registered (i.e. informal) may have an easier time acquiring such formal resources. In delegitimizing the state, and the formal firms that sought state approval, revolutions allow *informal* firms to more easily acquire *formal* resources, thereby blurring the distinction between the formal and informal sectors of the market.

We argue such a reversal arises because in the midst of revolution, the state is not just unable to adequately regulate markets; the state is equally unable to regulate its own institutions. Revolutions do not just blur market boundaries; they also generate distance between state regulatory institutions that decide how state resources ought to be allocated and those state institutions that actually implement such resource allocations. To understand why this is, we expand upon Fligstein and McAdam (2012)’s notion of “strategic action fields” and “internal governance units”. Similar to organizational fields (DiMaggio and Powell 1983), a strategic action field is a mesolevel social order in which individuals or collectives interact with each other on the basis of shared understandings about the field’s purposes, relationships to other fields, and the rules governing appropriate actions in such fields (Fligstein and McAdam 2012, p. 9). A strategic action field is stabilized through the existence of internal governance units, which are structures within each field that ensure the compliance of all members to field norms (p. 14). States comprise many institutions that act across numerous fields of social life, or numerous strategic action fields (p. 71-74).

We use this distinction between strategic action fields and internal governance units to distinguish between state regulatory bodies that issue rules from those state institutions responsible for implementing these rules. While state regulatory bodies issue directives that apply across strategic action fields, state institutions that implement these directives operate within a single arena and, in essence, act as the state’s internal governance units. For example, a legislative body works across strategic action fields, while a state bank acts as internal governance units to this legislative body within a single strategic action field, that of the market (Fligstein 2001). In normal

times, the internal governance units reflect the rules and will of state regulatory bodies; internal governance units stabilize a field in accordance with state regulation.

As a revolution successfully disrupts these state regulatory bodies, the ability of these bodies to enact rules in any field is undermined. As state regulatory bodies are rendered ineffective due to the momentum of a revolution, state internal governance units can begin to act independent of such bodies and in alignment with the social movements that spawned the revolution. In these times of instability, “the actions of ‘state’ actors are more apt to promote ongoing instability than order” (Fligstein and McAdam 2012, p. 102). In times of order, internal governance units continuously stabilize a field. In times of revolution, internal governance units are actually a source of continued upheaval.

The overall implication is that as a revolution takes hold, state regulatory bodies can no longer manage state internal governance units in each respective strategic action field. While prior to a revolution state financial institutions were constricted to dispensing funds in ways that complied with state regulations (Adly 2009, Dinç 2005), revolutions impede state regulatory bodies from enforcing such compliance. Revolutions separate state regulatory bodies from their internal governance units within each strategic action field. Previously, state financial institutions funded formal (registered) firms that solidified the state’s ability to establish order. Now, state financial institutions, which are internal governance units within the market field, can fund informal (unregistered) firms that further propagate the instability of a revolution.

One could plausibly argue that if a revolution is strong enough to topple state regulatory capacity, should it not also topple the functioning of the entire state, including any of its internal governance units? Past scholarship indicates very few social movements have resulted in strong enough revolutions to topple the entire state apparatus; in fact, most often lose momentum and lead to a reemergence of the old order (Padgett and McLean 2006). This is particularly true for authoritarian regimes. These regimes do not just operate with high “despotic power” in that they can issue regulations without participation from the general populace. They also have high “infrastructure power” in that they effectively implement such objectives through state institutions that can deeply penetrate the rest of society (high “infrastructural power”) (Mann 1984). Thus, while revolutions may disrupt these state’s ability to regulate, state infrastructure often still remains intact as these institutions are so deeply intertwined with the rest of society that they are still crucial for society’s continued functioning (Skocpol 1979). In so doing, we argue our theoretical arguments actually better reflect a wider set of social movements that incite insurrection, as opposed to those very rare few that lead to a toppling of the entire state system.

Tunisia and Egypt just after the onset of the Arab Spring are again insightful in making these theoretical arguments more tangible. Even though the Tunisian and Egyptian states as public authorities did not witness a complete collapse following the ouster of their two long-standing dictators in 2011, the state capacity to regulate the market was considerably weakened in both countries. The police was no longer capable of enforcing state regulations, and local politicians were delegitimized or even sidelined (Adly 2016). The revolution was so disruptive that the police could not even regulate the most ordinary and basic economic transactions because the police was linked to pre-revolution regime repression (Abdelrahman 2013, Bayat 1997). Many bureaucrats became so afraid of being persecuted for corruption charges that they shied away from taking any action with distributive consequences to local markets. This was labeled as “*the shaky hands phenomenon*” (Amgad 2015), which only further paralyzed the Egyptian state’s capacity to regulate markets. In short, while the Tunisian and Egyptian states remained, the Arab Spring rendered their regulatory bodies increasingly dysfunctional.

Following the collapse of the Mubarak in Egypt and Ben Ali in Tunisia, each country's banking sector was especially deterred from dispensing funds to formal firms. The revolution disrupted the former state-business networks that had considerable power in how banks dispensed funds (Adly 2012, Rijkers, Caroline, and Antonio 2014). Many formal entrepreneurs that were politically connected faced corruption charges, some fled abroad and some were even imprisoned. As a result, many such enterprises went out of business following the revolution and had problems repaying back the debts that they incurred from banks (2011, Saleh 2011). All these factors made banks more hesitant to extend credit to formal firms after the revolution.

Yet, following the collapse of these two regimes, informal (unregistered) entrepreneurs actually found it easier to acquire loans. We see such a trend in Egypt's and Tunisia's micro-lending markets. In Egypt, micro-lending, largely supplied by state-owned banks, increased in the post-2011 period at a rate much higher than the rate of growth in the formal private sector credit. According to unpublished data one author gathered from the Bank of Cairo, which holds around 40 percent of total micro loans in Egypt, micro-lending expanded between 2011 and 2015 at an annual average of 28.3%, whereas the growth rate of formal private sector credit was a humble 4.56% during the same period (from Central Bank of Egypt 2011, 2013, and 2014 Annual Report). When asked about these programs, a banker from the Bank of Cairo (*Banque du Caire*) noted, "*the bank expanded its micro-lending facilities after the revolution predominantly by introducing a new program for individuals operating informal firms* (translated from Arabic)".

In Tunisia, amidst the post-revolution decline in private sector credit, loans to informal micro and small and medium-sized enterprises increased considerably. From 2011-2013, Tunisia's state-owned bank, *the Banque de Financement des Petites et Moyennes Entreprises* (BFPME), invested an average of 201.2 million Tunisian dinars (\$77.83 million) on 530.5 projects annually. From 2005-2010, the BFPME only invested an average of 141.2 million Tunisian dinars (\$53.41 million) on 177.5 projects annually. The increase is even more drastic for another state-owned Tunisian bank, *the Banque Tunisienne de Solidarité* (BTS). From 1997-2010, the BTS invested an average of 40.84 million Tunisian dinars (\$15.71 million) on 4,659.1 projects annually. From 2011-2013, the BTS invested an average of 113.57 million Tunisian dinars (\$43.68 million) on 10,152.2 projects annually (from Central Bank of Tunisia 2004, 2007, 2008, 2011, and 2013 Annual Reports).

In short, revolutions disrupt the state's capacity to regulate markets and thus blur the line between informal and formal sectors of the market. Besides being unable to regulate markets, revolutions render the ability of state regulatory bodies to regulate its own institutions. This creates distance between state regulatory agencies that act across strategic action fields and those state institutions that serve as the state's internal governance units within each of these fields. This distance allows internal governance units to act in ways that are aligned with the revolution. While previously these internal governance units were a source of stability, these units are now catalysts of instability. The counterintuitive implication then is that state financial institutions are more likely to invest in informal firms as opposed to formal firms in the midst of a revolution. We see such trends in the drastic increase of micro-lending to informal firms by both Egyptian and Tunisian state-owned banks during the Arab Spring. Therefore, we expect,

H1: After a revolution, informal firms (unregistered firms) are more able to acquire startup capital from formal institutions (state financial institutions) than formal firms (registered firms).

Revolutions and Accepted Organizational Forms

If indeed registered firms become illegitimate, then any business form that is similar in structure to that of a registered firm may also be harmed. For example, in the US brewing industry, contract breweries were considered an illegitimate form of micro-brewing, yet they are indistinguishable from microbreweries, a legitimate form of micro-brewing. As such, prior studies show that as microbrewery survival increased, so too did contract breweries because they are difficult to tell apart (Carroll and Swaminathan 2000). From this perspective, we argue certain business forms, whether registered or not, may have trouble acquiring formal resources if they have a structure similar to that of a registered firm.

Tunisian and Egyptian commercial and corporate codes are derived from French civil code. From that legal jurisprudence, partnerships (*sharikat al-ashkhas*) are more formalized as the legal system in both countries recognizes partnerships as judicial persons that are legally independent of their owners. In Egypt and Tunisia, family-owned firms and non-family partnerships reflect such a business form. Even though they may be unregistered, they can nevertheless more easily note fellow family members or fellow partners as collateral for bank loans. As a result, prior to the revolution, they could acquire bank loans in ways similar to that of any registered firm (Adly 2014).

In Egypt and Tunisia, partnerships have structures that mimic that of registered firms. As such, the illegitimacy conferred on registered firms after the revolution should spillover to negatively affect partnerships whose structure is less distinguishable from that of a registered firm, whether they are actually registered or not. As such, the revolution should make it harder on these firms to acquire resources. Therefore, we expect:

H2: After a revolution, firms whose structures mimic those of registered firms (partnerships) are less able to acquire startup capital from formal institutions.

On the other hand, in both Tunisia and Egypt, sole proprietorships are not considered judicial persons. As a company (*shareka*) implies the partnership of a number of persons, economic units that are owned and run by sole individuals are not recognized as independent entities from their owners (Al-Ayari 2014, El-Kalioubi 2002, Shamassaan 1994). In other words, sole proprietorships (*al monsha'a al fardiya*) are indistinguishable legally and financially from their owners. In fact, they can only be registered by registering the owner in the commercial registry where they receive the status of a merchant and their business operations are not considered as separate entities.

As such, in Egypt and Tunisia, sole proprietorships are a less formally recognized business form than are partnerships. Therefore, their structure more closely resembles that of an unregistered firm, whether they are registered or not. As such, the legitimacy conferred on unregistered firms after the revolution should spillover to positively affect sole proprietorships whose structure is less distinguishable from that of an unregistered firm. In fact, the aforementioned micro-lending program data from the Bank of Cairo includes sole proprietorships as the bank considered such firms as analogous to unregistered firms and, thus, a less legally recognized business form. As such, the revolution should make it easier on these firms to acquire resources. Therefore, we expect:

H3: After a revolution, firms whose structures mimic unregistered firms (sole proprietorships) are more able to acquire startup capital from formal institutions.

Figure 1 summarizes our core theoretical argument that those in the informal sector (including businesses whose forms reflect informality) actually find it easier to gain formal resources (i.e. from state banks) after the revolution. Informal firms are considered more legitimate during a revolution as they are perceived as also rejecting the state. At the same time, state financial institutions can make such investments in these firms because during a revolution, state regulatory bodies cannot adequately monitor their activities.

DATA & METHODS

Data Sample: Tunisian and Egyptian Entrepreneurs in the Midst of the Arab Spring

This study's analysis is derived from a unique survey sample constructed of Tunisian and Egyptian entrepreneurs just after the Arab Spring in 2013. Though the revolution began in late 2010 and early 2011, the tumult of the revolution was still ongoing during the time of data collection. In Egypt, the build-up for the June 30, 2013 mass demonstrations against the Brotherhood-backed president Mohamed Morsi were underway. This culminated in the July 3rd military takeover and was then followed by a general crackdown on political opposition. In Tunisia, there was increasing tension over constitution drafting between the Islamists and the secularists. Some secularist figures were even assassinated and the constituent assembly sessions were suspended (Bellin 2013).

Sampling Strategy

While this instability is attractive for our research question, this came with the clear tradeoff that gathering a large sample was infeasible, given the great personal risks taken to collect such a sample. With this mind, great care was taken to ensure the small sample collected was as representative as possible. To achieve this, we designed a novel sampling strategy that we tailored for studying systems undergoing revolution, and we feel this design can be replicated for studying other similar "systems in flux" due to environmental jolts (Meyer 1982, Meyer, Gaba, and Colwell 2005).

First, to ensure as representative of a sample as possible, we sought to randomly stratify our sample based on measures for which reliable official statistics were available for each country of study (Tunisia and Egypt). In particular, the sample was stratified by legal status (i.e. registered vs. unregistered), gender, enterprise employee size, and sub-national region. The appropriate proportions sampled along each of these strata were determined through an exhaustive search of best available archival sources that could be found regarding each country's gender, age, regional population distribution, as well as business composition and levels of informality (i.e. registered or not).

Second, we sampled formal firms through randomly selecting firms from known government firm directories. In Egypt, formal (i.e. registered) entrepreneur data was collected through the Federation of Economic Development Associations (FEDA). FEDA is the largest and only federation of micro and small enterprises whose members are across all of Egypt, and whose members are indicative of the typical state registered Egyptian enterprise. In Tunisia, formal entrepreneur data was collected through the state network of business centers (*Centres D'affaires*), which is where all local enterprises seek assistance in registering with the Tunisian state. For this data, firms were randomly selected from their membership directories.

Sampling informal firms is more challenging than formal firms because these entrepreneurs are engaged in activities that are not compliant with state law, so they desire to remain anonymous

to avoid being discovered. As such, informal entrepreneurs are “hidden populations” analogous to other populations engaged in illegal or illicit activities such as drug users or sex workers (Magnani et al. 2005, Watters and Biernacki 1989). Moreover, Egyptian and Tunisian society is highly atomistic, whereby trust is predominantly confined only to kinship groups as opposed to institutions (Gilmore 1982). Such an atomistic society creates a strong likelihood that networks of such informal firms, our hidden population of interest, are not overlapping. In such cases, more conventional snowball or respondent-driven sampling techniques are infeasible as they likely will only sample a single portion of the entire network of members, which would not be representative of the entire hidden population (Watters and Biernacki 1989). As such, randomly sampling such a hidden population is infeasible.

Given these challenges, the third step in our sampling strategy was to sample informal (i.e. unregistered) firms through developing novel approach that we term “site-based sampling with penalty”. As with prior studies engaged in site-based sampling techniques (Magnani et al. 2005, Watters and Biernacki 1989), site-based sampling is done through sampling in locations where those in the hidden population of interest are known to frequent. To conduct our site-based sampling, we identified locations with local organizations whose business services were sought-after by any informal firm. To identify these sites, we engaged in a series of interviews, discussion groups, and ethnographic observations across various locations in Tunisia and Egypt. To then further ensure sampling was not just on a single network of members in the hidden population, we additionally “penalized” the sample through only including those respondents that had at least one non-family employee. By only including respondents with at least one non-family employee, this better ensured the collected sample of informal enterprises was a more diverse representation of the entire hidden population (i.e. informal entrepreneurs) and not reflective of only a single closed kinship-based subset of this population.

To illustrate this technique, we document how this site-based sampling with penalty technique was conducted in Cairo, one of our study’s locations. From our interviews, discussion groups, and ethnographic observations, we discovered two local NGOs in two of Cairo’s more popular neighborhoods for informal entrepreneurs (Imbaba and Zabaleen). We directly observed numerous different informal entrepreneurs frequent these two NGOs because they were providing these entrepreneurs with highly sought after social and legal services. Moreover, we found that working with this NGO to collect data helped build trust amongst respondents, which was the only reason these entrepreneurs were willing to complete the survey. If we discovered the entrepreneur only had other family members as employees, we discontinued surveying and went onto the next entrepreneur identified as frequenting this NGO location. A similar procedure was conducted in other locations across Egypt and Tunisia.

Besides the careful sampling approach taken to collect our data, another important benefit of our sample is that we did not sample on the revolution. The data collected was only focused on the differences between informal and formal entrepreneurs. In this way, the revolution is not just an exogenous market shock but is also exogenous to the sampling approach undertaken. The final result was a sample that was as close to a representative sample of formal and informal entrepreneurs as could be feasibly acquired under such extreme conditions. As Table 1 demonstrates, the resulting sample is generally representative of what is observed from the most exhaustive official statistics available. This approach resulted in a sample of 160 completed surveys for our analysis (94 from Egypt and 66 from Tunisia).

Variables and Statistical Methods

Our dependent variable was *Formal Resources*. Formal resources was the percentage of the respondent's startup capital that came from financial institutions (i.e. state-owned banks). Given these values were percentages, this variable was a continuous variable with values ranging from 0-1. In the robustness checks section, we test other startup capital sources, such as informal resources from family and friends, to show these effects are focused on formal resources and not general to other resource types.

Our independent variables are *Revolution*, *Registered*, *Partnerships*, and *Sole Proprietorship*. *Revolution* was whether the firm was founded on or after 2011 (1-Yes, 0-No), which was when the main events of the Arab Spring transpired. *Registered* was whether the respondent had a commercial or industrial registration or a tax card (1-Yes/0-No). *Partnership* was coded based upon whether the respondent denoted their firm was either family-owned or a non-family partnership/corporation (1-Yes/0-No). *Sole Proprietorship* was coded based upon whether the respondent denoted their firm was a sole proprietorship (1-Yes/0-No).

We also employed a series of controls. Because prior entrepreneurial experience and prior education level has been shown to affect the likelihood of a firm getting resources (Hallen 2008), we controlled for these factors through *Prior Entrepreneurial Experience* (1-Yes/0-No) and through *Prior Education Experience* (3-Prior Higher Education, 2-Prior High School Education, 1-Prior Primary School Education, 0-No Formal Education). We controlled for *Founder Age* (0: under 20, 1: 21-30, 3: 41-50, 4: 51-60, 5: over 60) because the founder's age can influence the ability to acquire resources (Evans and Leighton 1989, Gimeno et al. 1997). We controlled for *Firm Size* (1: less than 6 employees, 2: 6-50 employees, 3: 50-100 employees, 4: more than 100 employees) because in Egypt and Tunisia, a firm's size makes it historically easier to get loans as banks have high collateral requirements that are easier for larger firms to meet (Cull, Davis, and Lamoreaux 2006, Rocha et al. 2011). Because high-tech sectors are often more capital-intensive, increasing the need for more financial resources, we also controlled for whether the firm was in a high-tech sector (such as computer software, for example) through the variable *High-Tech* (1-Yes/0-No). Finally, we added country fixed effects (i.e. Egypt vs. Tunisia) and regional fixed effects for the three regions sampled within each country (Egypt: Cairo, Lower Egypt, and Upper Egypt; Tunisia: Tunis, Guebili, and Montasir).

Given our dependent variable is a percentage variable that goes from 0 to 1, we ran both OLS and quasi-maximum likelihood probit regressions (we also ran these as logit regressions with similar results) with heteroskedasticity-consistent standard errors. We also present a series of placebo regressions to ensure as much as possible that our findings were, given sample constraints, robust to other specifications and alternative explanations.

RESULTS

Table 2 presents the descriptive statistics and correlation matrix for our measures. As expected, being founded after the revolution is associated with smaller firms, younger founders, and less high-tech ventures. Because revolutions increases market uncertainty, those who enter are likely those with less opportunities elsewhere (younger founders) and are likely to enter in spaces that require less capital and, thus, are less risky (low-tech, smaller firms).

Table 3 shows the OLS and quasi-maximum likelihood binomial regressions models on *Formal Resources* that test H1, H2, and H3. Hypothesis 1 posits that registered firms are less likely to acquire startup capital from formal state sources than before the revolution. Therefore, a negative and significant relationship is expected between *Revolution x Registered* and *Formal*

Resources. The results support this hypothesis (Table 3: Binomial, M2 – $p < 0.05$; OLS, M2 – $p < 0.05$). Such a finding indicates that registered firms had a harder time acquiring startup capital from formal institutions, while unregistered firms had an easier time acquiring such resources.

Hypothesis 2 posits partnerships that mimic the form of registered firms should also be less able to acquire startup capital from formal state resources than before the revolution. Therefore, a negative and significant relationship is expected between *Revolution x Partnership* and *Formal Resources*. The results support this hypothesis (Table 3: Quasi-Binomial, M3 – $p < 0.001$; OLS, M3 – $p < 0.01$). On the other hand, Hypothesis 3 posits sole proprietorships that mimic more the form of an unregistered firm should be more able to acquire startup capital from formal state sources than before the revolution. Therefore, a positive and significant relationship is expected between *Revolution x Sole Proprietorship* and *Formal Resources*. The results support this hypothesis (Table 3: Quasi-Binomial, M4 – $p < 0.001$; OLS, M4 – $p < 0.01$).

Of additional note here is the non-effect of the main effect of *Revolution* on *Formal Resources*. In alignment with our hypotheses, we surmise such a non-effect occurs because the revolution does not affect all types of firms equally. While informal (unregistered) firms and sole proprietorships benefit from the revolution, partnerships are actually harmed from the revolution. As such, we surmised these countervailing effects cancel each other out and are what generate this non-effect of *Revolution* on *Formal Resources*.

Figure 2 shows the interaction plots from the regression models in Table 3. Unregistered firms benefit significantly more from than revolution than registered firms. As is evidenced from these plots, sole proprietorships benefit significantly more from the revolution than firms that are not sole proprietorships. Finally, partnerships benefit significantly less from than revolution than firms that are not partnerships.

Sensitivity Analysis

Thus far, we have assumed formality simply means whether or not the firm is registered with the government. However, this does not adequately consider whether firms actually act in ways that are in alignment with their registration status. In other words, if a firm is registered, they should predominantly be using formal contracts and procedures when conducting business and not resort to informal means of conducting business. Therefore, we conduct a sensitivity analysis to determine whether firms both are registered and act in accordance to formal rules. To do this, we additionally asked respondents how often they used formal contracts in their business transactions. We then split the sample based on those who responded “always” or “often” to using formal contracts and those who responded “rarely” or “never” to using formal contracts. If our results are accurate and reflective of actual firm actions, then the negative result obtained between *Registered x Revolution* on *Formal Resources* (H1) should be most significant for those firms that rarely or never use formal contracts. These are the firms that are both informal in their registration status (Registered=0) and their actual business conduct is equally informal (rarely or never use business contract). As shown in the Sensitivity Analysis in Table 3, the negative result of *Registered x Revolution* on *Formal Resources* is most prominent for those firms who rarely or never use business contracts ($p < 0.001$). To ensure results were not due to over-specification from controls, we ran a parsimonious model without controls and the results held. We also ran an additional check with just country and regional fixed effects and the results also held (not shown). Such a result suggest our definition of formality reflects not just registration status but also how these firms actually conduct business.

Robustness Checks

Despite our small sample size, we were able to engage in some robustness checks to rule out as best as possible some alternative explanations (Table 4). First, we narrowed the band of the analysis to ensure as much as possible that we were analyzing firms founded as near to the revolution as possible. When we reanalyzed our results for firms that were only 5 years or older, our results were similar.

We also ran a series of placebo regressions. In the first set, we naively assumed the main events of the revolution happened the year before the Arab Spring (i.e. 2010). This was to determine whether our effects are indeed a function of the revolution or a more secular effect that persists over time. These regressions indicate the results do not hold and are no longer significant, which suggests that the Arab Spring does seem to be driving these results. In the second set, we ran placebo regressions on informal resources (money from friends and family). The effects we find for formal resources should not apply to these informal resources as the state does not control such resources. These regressions show no effect on informal resources from the revolution. This further suggests that the mechanism through which revolutions shape markets is through weakening the state's ability to construct and enforce market boundaries, as well as to regulate its own institutions.

DISCUSSION

We began this study asking: how do revolutions shape markets? Revolutions are unique from other social movements in that they directly call into question the ability of the state in its current form to realize the popular will. In this way, the state can no longer credibly referee market boundaries. From this insight, we developed theory and provided initial evidence that suggest during a revolution, informal (i.e. unregistered) firms are better able to acquire formal resources (i.e. resources from state-owned financial institutions, namely state banks) than formal (i.e. registered) firms. Moreover, during a revolution, we find that those business forms that mimic formal firms (i.e. partnerships) are less likely to receive formal resources, while those forms that mimic informal firms (i.e. proprietorships) are more likely to receive formal resources, irrespective of registration status.

Implications for Infrastructure Management and Assessment

While this particular analysis is focused on state financial infrastructure, we also believe this has implications towards the management of large-scale physical infrastructure. First, we see this study as bringing an organizational lens towards understanding the operation of large-scale infrastructure in the midst of extreme events (i.e. revolution) that is not often used in such a context. In fact, recent calls have argued there needs to be more attentive to these factors, especially in how they relate to the resilience of such systems (Bocchini et al. 2014, Chang 2009). With few exceptions (O'Rourke, Lembo, and Nozick 2003), the focus on "extreme events" has been natural disasters such as flooding or earthquakes. Moreover, the social dimensions around infrastructure are largely focused on the negative social impacts that arise from after infrastructure fails or is compromised, and not how social forces can actually lead to such failure or changes in the first place. In so doing, we follow the influence of other works that bring an organization lens into international engineering projects (Javernick-Will and Levitt 2010, Javernick-Will and Scott 2010), and leverage a similar lens to initiate links between social unrest as "an extreme event" and its

effects on infrastructure management. Such links have been initiated on highly politicized and contested forms of infrastructure such as dam systems (Lin 2007, McCormick 2006, Rothman and Oliver 1999). However, unlike these studies, our study explores how infrastructure operations change while in the midst of such unrest.

Second, we advance a methodology (“site-based sampling with penalty”) for assessing infrastructure systems in the midst of an extreme event, in this case a revolution, particular as they affect populations that may not want to be identified or mistrust outsiders. As such, we see this novel sampling methodology as one that can be replicated for studying other infrastructure systems experiencing social unrest. For example, the most vulnerable populations in such areas are often the targets of those perpetuating such unrest. Given these populations are being targeted, they likely have the most deteriorated infrastructure as these areas are attracting the brunt of the conflict. Yet at the same time, being targets of such social unrest makes these populations the most likely to hide and avoid identification. We feel the novel methodology we advance here can help make inroads into understanding such populations and the scale of their infrastructure problems, particularly in the post-conflict phase when the conflict is waning but its resolution is still uncertain.

REFERENCES

2011. "Egyptian companies escape their debts by declaring bankruptcy: Bankruptcy rates up by 243.3% (In Arabic)." *Al-Arabiya*.
<http://www.alarabiya.net/articles/2011/07/13/157447.html>.
- Abdelrahman, Maha. 2013. Ordering the Disorderly: Street Vendors and the Developmentalist State. *Jadaliyya*.
- Adly, A. I. 2009. "Politically-Embedded Cronyism: The Case of Post-Liberalization Egypt." *Business and Politics* 11 (4):1-26.
- Adly, A. I. 2012. Mubarak (1990-2011): The State of Corruption. Arab Reform Initiative (ARI).
- Adly, A. I. 2014. Reforming the Entrepreneurship Ecosystem in Post-Revolutionary Egypt and Tunisia. Stanford University: Center on Democracy, Development, and the Rule of Law and the Center for International Private Enterprise.
- Adly, A. I. 2016. "Street vendors in Cairo after the January revolution: A social movement perspective (in Arabic)." In *Protestors and protest forms in Egypt after the January revolution*, edited by D. Elkhawaga. Cairo: Sifsafa Publishing House.
- Al-Ayari, K. 2014. *Al-Mosayer Fi Al-Shrikat Al-Tegariyya (In Arabic)*. Tunis: Al-Atrash Publishing House.
- Amenta, E., N. Caren, E. Chiarello, and Y. Su. 2010. "The Political Consequences of Social Movements." *Annual Review of Sociology*, Vol 36 36:287-307.
- Amgad, Amer. 2015. Labeeb: The state apparatus has ridden itself of the shaky hands (In Arabic). *Elbawabah news*.
- Bayat, Asef. 1997. *Street politics : poor people's movements in Iran*. New York: Columbia University Press.
- Belkacem, L., and F. Mansouri. 2012. "2012 GEM Tunisia: National Report." In: Global Entrepreneurship Monitor (GEM).
- Bellin, E. 2013. "Drivers of Democracy: Lesson from Tunisia." *Middle East Brief* 75.
- Bocchini, P., D. M. Frangopol, T. Ummenhofer, and T. Zinke. 2014. "Resilience and Sustainability of Civil Infrastructure: Toward a Unified Approach." *Journal of Infrastructure Systems* 20 (2). doi: Artn 04014004

- 10.1061/(Asce)Is.1943-555x.0000177.
- CAPMAS. 2014. "Annual Statistical Book of 2014." In. Cairo, Egypt: Central Agency for Public Mobilization and Statistics (CAPMAS).
- Carroll, Glenn R., and Anand Swaminathan. 2000. "Why the Microbrewery Movement? Organizational Dynamics of Resource Partitioning in the U.S. Brewing Industry." *American Journal of Sociology* 106 (3):715-762.
- Chang, Stephanie E. 2009. "Infrastructure Resilience to Disasters." *The Bridge* 44 (3):36-41.
- Cull, R., L. Davis, and N. Lamoreaux. 2006. "Historical financing of small- and medium-size enterprises." *Journal of Banking & Finance* 30:3017-3042.
- DiMaggio, P. J., and W. W. Powell. 1983. "The Iron Cage Revisited - Institutional Isomorphism and Collective Rationality in Organizational Fields." *American Sociological Review* 48 (2):147-160.
- Dinç, I. Serdar. 2005. "Politicians and banks: Political influences on government-owned banks in emerging markets." *Journal of Financial Economics* 77 (2):453-479.
- El-Kalioubi, S. 2002. "Company Law." In *Egypt and Its Laws*, edited by N. Bernard-Maugiron and B. Dupret. London, The Hague, New York: Kluwer Law International.
- El-Mahdi, A. 2006. MSEs potentials and success determinants in Egypt 2003-2004: special reference to gender differentials. In *Promoting Competitiveness in Micro and Small Enterprises in the MENA Region*. Cairo: Egyptian Research Forum, Research Report Series No.: 0418 (FEM 21-31).
- Evans, D. S., and L. S. Leighton. 1989. "Some Empirical Aspects of Entrepreneurship." *American Economic Review* 79 (3):519-535.
- Fligstein, N. 1996. "Markets as politics: A political-cultural approach to market institutions." *American Sociological Review* 61 (4):656-673.
- Fligstein, Neil. 2001. *The architecture of markets : an economic sociology of twenty-first-century capitalist societies*. Princeton: Princeton University Press.
- Fligstein, Neil, and Doug McAdam. 2012. *A theory of fields*. New York: Oxford University Press.
- Ghanem, H. 2013. The Role of Micro and Small Enterprises in Egypt's Economic Transition. *Global Economy & Development*.
- Gilmore, D. D. 1982. "Anthropology of the Mediterranean Area." *Annual Review of Anthropology* 11:175-205.
- Gimeno, J., T. B. Folta, A. C. Cooper, and C. Y. Woo. 1997. "Survival of the fittest? Entrepreneurial human capital and the persistence of underperforming firms." *Administrative Science Quarterly* 42 (4):750-783.
- Global Entrepreneurship Monitor, ed. 2013. *2012 Women's Report*: Babson College.
- Goldstone, J. A. 2001. "Toward a fourth generation of revolutionary theory." *Annual Review of Political Science* 4:139-187.
- Greve, H. R., Jo-Ellen Pozner, and H. Rao. 2006. "Vox Populi: Resource Partitioning, Organizational Proliferation, and the Cultural Impact of the Insurgent Microradio Movement." *American Journal of Sociology* 112 (3):802-837.
- Guha-Khasnobis, Basudeb, S. M. Ravi Kanbur, and Elinor Ostrom. 2006. "Beyond formality and informality." In *Linking the formal and informal economy : concepts and policies*, edited by Basudeb Guha-Khasnobis, S. M. Ravi Kanbur and Elinor Ostrom. Oxford: Oxford University Press.

- Hallen, B. L. 2008. "The Causes and Consequences of the Initial Network Positions of New Organizations: From Whom Do Entrepreneurs Receive Investments?" *Administrative Science Quarterly* 53 (4):685-718.
- Hattab, H. 2012. "GEM Egypt Report 2012." In. Global Entrepreneurship Monitor (GEM): Cairo, Egypt.
- Haveman, H., H. Rao, and S. Paruchuri. 2007. "The Winds of Change: The Progressive Movement and the Bureaucratization of Thrift." *American Sociological Review* 72:117–142.
- Hiatt, S. R., J. Grandy, and B. H. Lee. 2015. "Organizational responses to public and private politics: An analysis of climate change activists and U.S. oil & gas firms." *Organization Science* forthcoming.
- Hiatt, S. R., W. D. Sine, and P. S. Tolbert. 2009. "From Pabst to Pepsi: The deinstitutionalization of social practices and the creation of entrepreneurial opportunities." *Administrative Science Quarterly* 54 (4):635.
- Institut Statistique de Tunisie. 2014. "Census." In: Institut Statistique de Tunisie (Tunisia). <http://rgph2014.ins.tn/ar/%D8%A7%D9%84%D9%86%D8%AA%D8%A7%D8%A6%D8%AC>.
- Javernick-Will, A., and R. E. Levitt. 2010. "Mobilizing Institutional Knowledge for International Projects." *Journal of Construction Engineering and Management-Asce* 136 (4):430-441. doi: 10.1061/(Asce)Co.1943-7862.0000110.
- Javernick-Will, A. N., and W. R. Scott. 2010. "Who Needs to Know What? Institutional Knowledge and Global Projects." *Journal of Construction Engineering and Management-Asce* 136 (5):546-557. doi: 10.1061/(Asce)Co.1943-7862.0000035.
- Lin, T. C. 2007. "Environmental NGOs and the anti-dam movements in China: A social movement with Chinese characteristics." *Issues & Studies* 43 (4):149-184.
- Magnani, R., K. Sabin, T. Saidel, and D. Heckathorn. 2005. "Review of sampling hard-to-reach and hidden populations for HIV surveillance." *Aids* 19:S67-S72. doi: DOI 10.1097/01.aids.0000172879.20628.e1.
- Mann, M. 1984. "The Autonomous Power of the State - Its Origins, Mechanisms and Results." *Archives Europeennes De Sociologie* 25 (2):185-213.
- McCarthy, John D., and Mayer N. Zald. 1977. "Resource Mobilization and Social Movements: A Partial Theory." *American Journal of Sociology* 82 (6):1212-1241.
- McCormick, S. 2006. "The Brazilian anti-dam movement - Knowledge contestation as communicative action." *Organization & Environment* 19 (3):321-346. doi: 10.1177/1086026606292494.
- Meyer, A. 1982. "Adapting to Environmental Jolts." *Administrative Science Quarterly* 27 (4):515-537.
- Meyer, A. D., V. Gaba, and K. A. Colwell. 2005. "Organizing far from equilibrium: Nonlinear change in organizational fields." *Organization Science*:456-473.
- O'Rourke, Thomas D., Arthur J. Lembo, and Linda K. Nozick. 2003. "Lessons Learned from the World Trade Center Disaster about Critical Utility Systems." In *Beyond September 11th: An Account of Post-Disaster Research*, edited by J.L. Monday, 269-290. Boulder, Colorado: Natural Hazards Research and Applications Information Center.
- Padgett, J. F., and P. D. McLean. 2006. "Organizational invention and elite transformation: The birth of partnership systems in Renaissance Florence." *American Journal of Sociology* 111 (5):1463-1568.

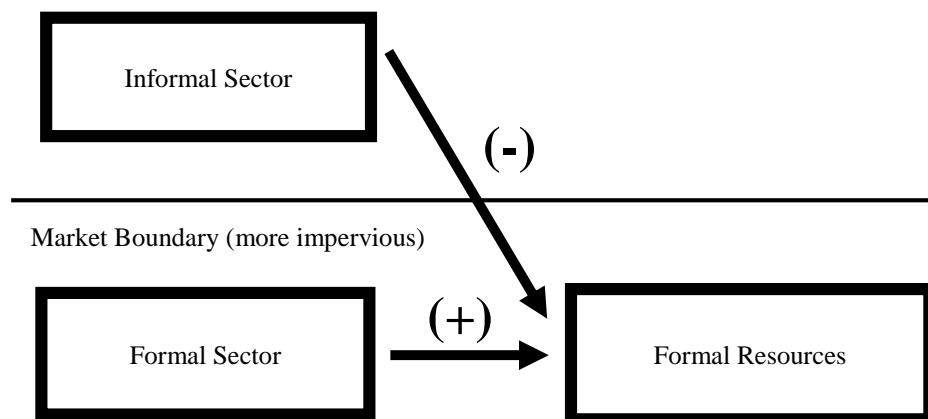
- Rijkers, B. , L. F. Caroline, and N. Antonio. 2014. All in the Family: State Capture in Tunisia. *World Bank Policy Research Working Paper, no. 6810.*
- Rocha, R., S. Farazi, R. Khouri, and D. Pearce. 2011. The Status of Bank Lending to SMEs in the Middle East and North Africa Region: Results of a Joint Survey of the Union of Arab Bank and the World Bank. *Policy research working paper no. 5607.*
- Rothman, Franklin, and Pamela Oliver. 1999. "From Local to Global: The Anti-Dam Movement in Southern Brazil." *Mobilization: An International Quarterly* 4 (1):41-57.
- Saleh, Amira. 2011. "Bankruptcy rates up by 108% in three months and the stock market loses 20 billion pounds in April (in Arabic)." *Al-Masri Alyoum*.
<http://today.almasryalyoum.com/article2.aspx?ArticleID=295385>.
- Schneiberg, M., and S.A. Soule. 2005. "Institutionalization as a contested, multilevel process: The case of rate regulation in American fire insurance." In *Social movements and organization theory*, edited by G. F. Davis, D. McAdam, W. Richard Scott and M. N. Zald, 122-160. Cambridge: Cambridge University Press.
- Shamassan, H. 1994. "Tasfiyat Sharikat Al-ashkhas Al-Tegariyya: Dirassa Moqarana (in Arabic)." PhD, Faculty of Law, Cairo University.
- Sine, W.D., and B.H. Lee. 2009. "Tilting at Windmills? The Environmental Movement and the Emergence of the U.S. Wind Energy Sector." *Administrative Science Quarterly* 54:123-155.
- Skocpol, Theda. 1979. *States and social revolutions : a comparative analysis of France, Russia, and China*. Cambridge: Cambridge University Press.
- Stevenson, L., and M. Abdel Aziz. 2008. Influencing Policy Key Factors in the Case of a SME Policy Project in Egypt.
- Stinchcombe, Arthur. 1965. "Social Structure and Organizations." In *Handbook of Organizations*, edited by J. G. March, 142-193. Chicago,: Rand McNally.
- Trabelssi, K. 2011. Current State of the Informal Economy in Tunisia as seen through its Stakeholders: Facts and Alternatives.
- Watters, J. K., and P. Biernacki. 1989. "Targeted Sampling - Options for the Study of Hidden Populations." *Social Problems* 36 (4):416-430.
- Zuckerman, E. W. 1999. "The Categorical Imperative: Securities Analysts and the Illegitimacy Discount." *American Journal of Sociology* 104 (5):1398-1438.

Table 1: Analysis of Sample Representativeness

Variables	Best Available Archival Sources (Egypt)	Our Sample (Egypt)	Best Available Archival Sources (Tunisia)	Our Sample (Tunisia)
Founder Age	18-24: 20% 25-34: 30% 35-44: 23% 45-54: 17% 55-64: 9% (Hattab 2012)	Under 20: 1% 21-30: 37% 31-40: 23% Over 40: 39%	18-24: 12% 25-34: 37% 35-44: 36% 45-54: 12% 55-64: 3% (Belkacem and Mansouri 2012)	Under 20: 2% 21-30: 47% 31-40: 39% Over 40: 8%
Regional Distribution	Greater Cairo: 25% Lower Egypt: 44 % Upper Egypt: 30 % (CAPMAS 2014)	Greater Cairo: 31% Lower Egypt: 42% Upper Egypt: 27%	Coastal areas including Grand Tunis (includes Monastir): 64% In-land provinces (Guebili): 36% (Institut Statistique de Tunisie 2014)	Coastal Areas including Grand Tunis and Monastir: 62% Guebili: 38%
Gender	Female: 14% (Global Entrepreneurship Monitor 2013)	12%	Female: 36% (Global Entrepreneurship Monitor 2013)	27%
Registered Firms	73.1% (license and/or tax card) (Ghanem 2013)	69%	(Trabelssi 2011) 70% (2010, based on GDP percentage)	75%
Firm Size	98% (employing less than 10 workers) (Stevenson and Abdel Aziz 2008)	97%	A 98% (employing less than 10 workers) (Rijkers, Caroline, and Antonio 2014)	98%

Figure 1: Summary of Theoretical Framework

Pre-Revolution (Unquestioned state; can set market boundary)



Post-Revolution (Questioned state; cannot set market boundary)

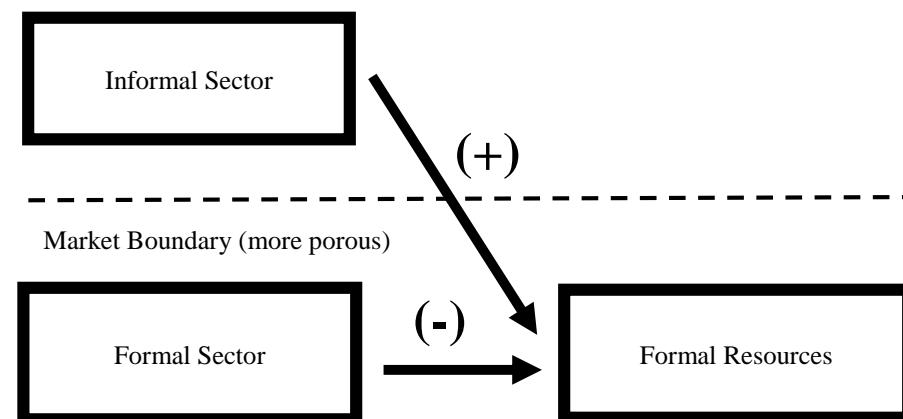


Table1: Descriptive Statistics and Correlation Matrix

	<i>Mean</i>	<i>SD</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>
<i>Dependent Variable</i>												
1. Formal Resources	0.15	0.27	1									
<i>Independent Variables</i>												
2. Revolution	0.31	0.46	0.18	1								
3. Registered	0.79	0.41	0.01	0.04	1							
4. Partnerships	0.44	0.50	-0.18	-0.21	0.02	1						
5. Sole Proprietorship	0.54	0.50	0.17	0.26	-0.04	-0.94	1					
<i>Controls</i>												
6. Hi-Tech	0.06	0.23	0.00	-0.10	0.12	0.11	-0.15	1				
7. Firm Size	1.33	0.60	-0.14	-0.21	0.26	0.24	-0.26	0.18	1			
8. Prior Entrepreneurial Experience	0.38	0.49	-0.08	-0.24	0.02	0.21	-0.20	-0.02	0.15	1		
9. Prior Education	2.42	0.90	0.08	0.13	0.22	-0.08	0.06	0.10	0.02	-0.22	1	
10. Founder Age	3.26	1.25	-0.14	-0.35	0.19	0.20	-0.20	0.01	0.30	0.32	-0.23	1

Table 2: Regressions on Formal Resources (quasi-maximum likelihood binomial regressions unless otherwise stated)

	<i>Controls</i>	<i>M1</i>	<i>M2</i>	<i>M3</i>	<i>M4</i>	<i>M2: OLS</i>	<i>M3: OLS</i>	<i>M4: OLS</i>
Intercept	-0.83 (0.67)	-0.84 (0.66)	-1.00 (0.71)	-0.97 (0.71)	-0.91 (0.65)	0.15 (0.12)	0.17 (0.12)	0.24* (0.12)
Hi-Tech	0.30 (0.46)	0.31 (0.46)	0.25 (0.45)	0.10 (0.46)	0.09 (0.46)	0.04 (0.08)	0.02 (0.08)	0.02 (0.08)
Firm Size	-0.03 (0.18)	-0.03 (0.18)	-0.12 (0.18)	0.02 (0.19)	0.02 (0.19)	-0.02 (0.02)	0.00 (0.03)	0.00 (0.03)
Prior Entrepreneurial Experience	0.09 (0.21)	0.08 (0.21)	0.08 (0.21)	0.05 (0.22)	0.05 (0.22)	0.02 (0.04)	0.02 (0.04)	0.02 (0.04)
Prior Education	0.04 (0.12)	0.04 (0.12)	0.02 (0.10)	0.08 (0.12)	0.07 (0.12)	0.01 (0.02)	0.01 (0.02)	0.00 (0.02)
Founder Age	0.06 (0.09)	0.07 (0.09)	0.02 (0.18)	0.04 (0.09)	0.04 (0.09)	0.01 (0.02)	0.00 (0.02)	0.00 (0.02)
Sole Proprietorship	-0.03 (0.45)	-0.04 (0.46)	-0.06 (0.48)	-0.28 (0.50)	-0.32 (0.45)	-0.01 (0.09)	-0.02 (0.09)	-0.08 (0.09)
Registered	-0.40 (0.31)	-0.39 (0.30)	0.25 (0.30)	-0.33 (0.30)	-0.33 (0.30)	0.02 (0.04)	-0.07 (0.06)	-0.07 (0.06)
Partnership	-0.40 (0.47)	-0.41 (0.47)	-0.39 (0.49)	-0.21 (0.51)	-0.26 (0.44)	-0.08 (0.09)	-0.03 (0.10)	-0.08 (0.09)
Revolution		0.04 (0.24)	1.02* (0.47)	0.38 (0.27)	-4.96*** (0.28)	0.25† (0.13)	0.11 (0.07)	-0.16** (0.05)
Revolution x Registered			-1.14* (0.51)			-0.28* (0.14)		
Revolution x Partnership				-5.33*** (0.35)			-0.26** (0.08)	
Revolution x Sole Proprietorship					5.34*** (0.35)			0.27*** (0.08)
<i>Country Fixed Effect</i>	<i>Included</i>	<i>Included</i>	<i>Included</i>	<i>Included</i>	<i>Included</i>	<i>Included</i>	<i>Included</i>	<i>Included</i>
<i>Sub-National Region Fixed Effect</i>	<i>Included</i>	<i>Included</i>	<i>Included</i>	<i>Included</i>	<i>Included</i>	<i>Included</i>	<i>Included</i>	<i>Included</i>
<i>Pseudo-R²</i>	0.23	0.23	0.25	0.29	0.29	0.22	0.22	0.22
<i>N</i>	160	160	160	160	160	160	160	160
<i>Residual df</i>	146	145	144	144	144	144	144	144

†p<0.10, *p<0.05, **p<0.01, ***p<0.001 (two-tailed); standard errors in parentheses

Figure 2: Interaction plots from quasi-maximum likelihood binomial regressions on formal resources (OLS produced similar plots)

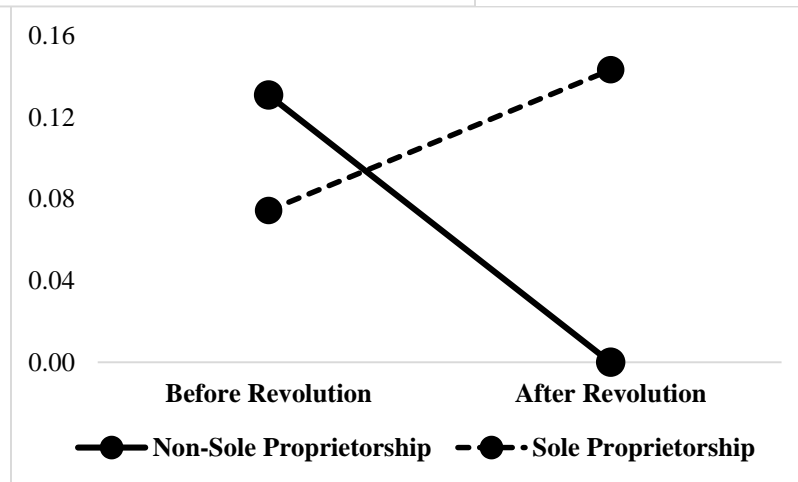
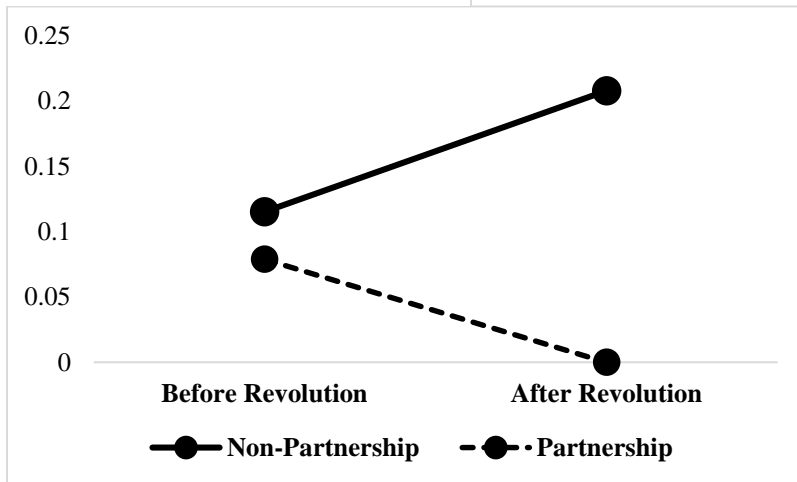
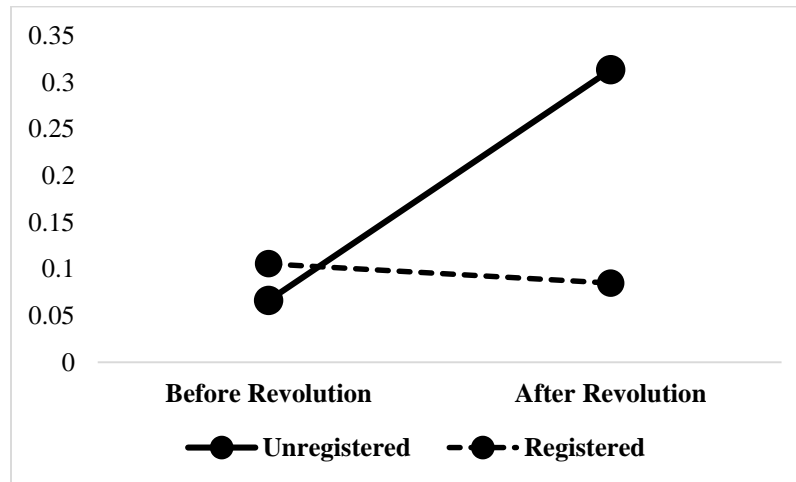


Table 3: Sensitivity Analysis (quasi-maximum likelihood binomial regressions; OLS and permutations not shown reflect similar results)

	Always or often use formal contracts	Rarely or never use formal contracts	Always or often use formal contracts (OLS)	Rarely or never use formal contracts (OLS)	Always or often use formal contracts (Parsimonious Model, OLS)	Rarely or never use formal contracts (Parsimonious model, OLS)
Intercept	4.43 [†] (2.48)	2.69* (1.05)	0.63+ (0.35)	0.45** (0.16)	-0.00 (0.00)	0.07 (0.05)
Hi-Tech	-0.91 (0.96)	-2.97*** (0.65)	-0.16 (0.18)	0.04 (0.07)		
Firm Size	1.14 (0.94)	-0.32 (0.55)	-0.02 (0.10)	-0.07 (0.06)		
Prior Entrepreneurial Experience	1.13 (0.85)	-0.22 (0.38)	-0.02 (0.15)	-0.02 (0.03)		
Prior Education	0.36 (0.35)	-0.18 (0.19)	0.01 (0.08)	-0.01 (0.02)		
Founder Age	-1.40* (0.55)	-0.07 (0.18)	-0.11+ (0.06)	0.00 (0.02)		
Sole Proprietorship	0.27 (0.73)	-4.11*** (0.83)	0.13 (0.11)	-0.36* (0.16)		
Registered	-2.35* (1.20)	-3.16** (0.97)	-0.06 (0.14)	-0.25 (0.19)		
Partnership	0.73 (1.92)	7.23*** (0.45)	0.49 (0.37)	0.98*** (0.06)	0.50 (0.35)	0.89*** (0.05)
Revolution	-0.79 (1.95)	0.33 (0.38)	0.18 (0.18)	0.04 (0.06)	0.12** (0.04)	0.05 (0.07)
Revolution x Registered	-1.70 (1.88)	-7.94*** (0.98)	-0.52 (0.37)	-1.08*** (0.13)	-0.47 (0.37)	-0.90*** (0.10)
<i>Country Fixed Effect</i>	<i>Included</i>	<i>Included</i>	<i>Included</i>	<i>Included</i>	<i>Not Included</i>	<i>Not Included</i>
<i>Sub-National Region Fixed Effect</i>	<i>Included</i>	<i>Included</i>	<i>Included</i>	<i>Included</i>	<i>Not Included</i>	<i>Not Included</i>
Pseudo-R²	0.50	0.53	0.34	0.52	0.13	0.23
N	31	49	31	49	31	49
Residual df	15	33	15	33	27	45

[†]p<0.10, *p<0.05, **p<0.01, ***p<0.001 (two-tailed); standard errors in parentheses

Table4: Robustness Checks (quasi-maximum likelihood binomial regressions; OLS and permutations not shown reflect similar results)

	Narrow to 5 years			Placebo regressions (Revolution = 2010)			Placebo regressions (informal resources from family and friends)		
	<i>M1</i>	<i>M2</i>	<i>M3</i>	<i>M1</i>	<i>M2</i>	<i>M3</i>	<i>M1</i>	<i>M2</i>	<i>M3</i>
Intercept	0.52 (1.87)	0.86 (1.67)	0.87 (1.64)	-1.09 (0.73)	-1.04 (0.65)	-0.77 (0.69)	0.88 (1.01)	0.68 (1.03)	0.68 (1.03)
Hi-Tech	0.67 (1.16)	0.18 (1.11)	0.18 (1.10)	0.27 (0.44)	0.21 (0.50)	0.29 (0.46)	-0.42 (0.45)	-0.45 (0.47)	-0.44 (0.47)
Firm Size	-0.58 (0.67)	-0.56 (0.63)	-0.56 (0.62)	-0.08 (0.18)	0.01 (0.18)	-0.02 (0.18)	0.04 (0.27)	-0.01 (0.28)	-0.01 (0.28)
Prior Entrepreneurial Experience	0.08 (0.33)	0.06 (0.35)	0.06 (0.35)	0.07 (0.21)	0.01 (0.21)	0.04 (0.21)	-0.26 (0.26)	-0.27 (0.26)	-0.26 (0.26)
Prior Education	-0.26 (0.16)	-0.18 (0.18)	-0.18 (0.18)	0.04 (0.11)	0.06 (0.11)	0.05 (0.11)	0.11 (0.15)	0.12 (0.14)	0.12 (0.14)
Founder Age	-0.05 (0.15)	-0.04 (0.16)	-0.04 (0.16)	0.06 (0.09)	0.05 (0.09)	0.06 (0.09)	-0.05 (0.13)	-0.06 (0.13)	-0.06 (0.13)
Sole Proprietorship	-0.06 (1.12)	-0.75 (1.07)	-0.76 (1.05)	-0.05 (0.46)	-0.06 (0.46)	-0.28 (0.53)	-1.47 [†] (0.76)	-1.42 [†] (0.76)	-1.41 [†] (0.77)
Registered	0.39 (0.49)	-0.46 (0.40)	-0.46 (0.40)	0.03 (0.36)	-0.35 (0.30)	-0.36 (0.30)	-0.18 (0.38)	0.14 (0.30)	0.13 (0.30)
Partnership	-0.73 (1.02)	-0.63 (0.96)	-0.63 (0.94)	-0.39 (0.47)	-0.12 (0.45)	-0.43 (0.48)	-1.42 [†] (0.77)	-1.38 [†] (0.80)	-1.38 [†] (0.78)
Revolution	0.97 [†] (0.53)	0.21 (0.29)	-5.00 ^{***} (0.56)	0.74 (0.47)	0.45 (0.33)	-0.09 (0.41)	-0.62 (0.64)	0.27 (0.37)	0.28 (0.46)
Revolution x Registered	-1.12 [*] (0.56)			-0.64 (0.50)			1.07 (0.65)		
Revolution x Partnership		-5.18 ^{***} (0.62)			-0.70 (0.52)			-0.02 (0.53)	
Revolution x Sole Proprietorship			5.21 ^{***} (0.62)			0.47 (0.45)			-0.03 (0.53)
<i>Country Fixed Effect</i>	<i>Included</i>	<i>Included</i>	<i>Included</i>	<i>Included</i>	<i>Included</i>	<i>Included</i>	<i>Included</i>	<i>Included</i>	<i>Included</i>
<i>Sub-National Region Fixed Effect</i>	<i>Included</i>	<i>Included</i>	<i>Included</i>	<i>Included</i>	<i>Included</i>	<i>Included</i>	<i>Included</i>	<i>Included</i>	<i>Included</i>
<i>Pseudo-R²</i>	0.28	0.31	0.31	0.24	0.25	0.24	0.09	0.08	0.08
<i>N</i>	94	94	94	160	160	160	160	160	160
<i>Residual df</i>	78	78	78	144	144	144	144	144	144

[†]p<0.10, *p<0.05, **p<0.01, ***p<0.001 (two-tailed); standard errors in parentheses