The Microeconomic Impact of Political Instability: Firm-Level Evidence from Tunisia

Samer Matta,[*] Simon Appleton[*] and Michael Bleaney[*]

Abstract:

This paper explores the impact of political instability on firms in the context of Tunisia which experienced a surge in political instability events after the 2011 Jasmine revolution. Using a new dataset, we show that political instability was a major concern for small and exporting firms as well as those that were operating in the tourism sector, those that suffered from acts of vandalism or arson and those that were located in the interior region of Tunisia. More importantly, we find strong evidence that political instability was the most damaging constraint to firm growth in Tunisia after the Arab Spring.

Keywords: Tunisia, Firms, Political Instability, Post-Revolution.

JEL Classification: D74, D22, O12, P26.

[*] Samer Matta (samer.matta@nottingham.ac.uk) from the University of Nottingham is the corresponding author. Simon Appleton is an Associate Professor of Economics at the University of Nottingham (email: simon.appleton@nottingham.edu.cn). Michael Bleaney is an Emeritus Professor of Economics at the University of Nottingham (email: michael.bleaney@nottingham.ac.uk).

1. Introduction

Five years after the Jasmine revolution of January 2011, the Tunisian economy is still struggling to recover despite the successful, albeit rocky, transition to a democratic regime crowned by the adoption of a new constitution in 2014 (World Bank, 2015). Economists and international organizations,[1] have found that political instability, which increased considerably after the Arab Spring as evident by the 18-fold surge in the number of protests/riots in 2011-2014 compared to 1997-2010, adversely affected the macroeconomic environment in Tunisia. However, to date and to our knowledge, the microeconomic implications of political instability on Tunisian firms remain unexplored.

In this context, this paper explores which Tunisian firms perceived political instability as an impediment to their operations and examines which business constraint was the most damaging to firm growth after the revolution. To do so, we use firm-level data from the Tunisian Enterprise Survey (TES) conducted between March 2013 and July 2014. Unlike other surveys, this database contains a firm-level measure of political instability defined as the manager's response to how much he/she considers political instability as a constraint to the firm's operations. In addition, the TES includes a lot of information on firm characteristics which enables us to control for different factors and thus minimize any possible omitted variable bias. Nonetheless, we fully acknowledge the limitations of the cross-sectional nature of our data and the use of a subjective measure of political instability. These empirical challenges, which are often encountered by researchers when using micro-level surveys to investigated the effects of political instability (Brück et al., 2016), call for designing systematic surveys that would provide valuable micro-data on political incidents across place and time.

This paper is mainly related to the literature that examined the determinants and effects of business constraints on firm performance.[2] Batra et al. (2003) were the first to assess the relation between business constraints and firm growth. Using data from 80 countries, they found that firm performance is negatively related to: financing constraints, corruption, higher taxes, inefficient business regulations, and policy uncertainty. Following this work, and given that World Bank Enterprise Surveys (WBESs) were later made available to the public,[61] researchers have extensively used these surveys to better understand the relation between business obstacles and firm performance. For instance, Beck et al. (2005) found that legal, financing and corruption constraints adversely impact firm growth which they measured as the growth of sales during the past three years. In related studies, Aterido et al. (2011) found that inefficient business regulations and lack of finance reduce the growth of full-time employees, while Ayyagari et al. (2008) found that finance, crime and policy uncertainty are the most damaging business constraints to firms across countries.

[1] Matta et al. (2016), Arieff and Humud (2015), IMF (2015) and World Bank (2015); among others.

[2] An extensive review of the literature that examined the impact of business constraints on firm performance can be found in World Bank (2004) and Dethier et al. (2011).

Although these studies have examined the effects of various business constraints on firm performance, political instability has not caught the attention of researchers so far, mainly because it was not explicitly mentioned as an obstacle in earlier surveys. Thus, this paper fills this gap by analyzing, for the first time, which firms perceive political instability as a significant obstacle to their operations. Moreover, most of the earlier studies in the literature have focused on cross-country regressions which suffer from two main caveats. First, they ignore heterogeneity among countries with distinct legal, regulatory and financial systems. Second, their estimation results might be driven by trends in big countries such as India and China (Krauss, 2015). Therefore, this study also adds to the literature by examining the previously unexplored implications of business constraints on firm growth in a context of mass civil protests and post-revolutions.

Our results suggest that political instability was a major concern for small and exporting firms as well as those that were operating in the tourism sector, those that suffered from acts of vandalism or arson and those that were in the interior region of Tunisia. More importantly, we find strong evidence that political instability was the most damaging constraint to firm growth in Tunisia after the Arab Spring. This result, which is confirmed using an instrumental variable (IV) estimation strategy with region-sector-size averages as benchmark instruments, is robust after (i) using employment growth as an alternative measure of firm performance and (ii) accounting for various business constraint levels.

The remainder of this paper is organized as follows. Section 2 introduces and describes the data, while section 3 explores which firms perceive political instability as a significant obstacle to their operations. This is followed by section 4 which determines the most damaging constraint to firm growth and performs some robustness checks. Finally, section 5 concludes.

2. Data and Descriptive Statistics

This section introduces the dataset and analyzes descriptively the business environment constraints to Tunisian firms. In this study, we use the 2013 Tunisian Enterprise Survey (TES) which was conducted jointly by the World Bank, the European Bank for Reconstruction and Development (EBRD), and the European Investment Bank (EIB).[3] The sampling unit of analysis is the "Establishment" which we denote interchangeably in what follows as "Firm" or "Enterprise".

The TES dataset, which was collected through personal interviews with 592 Tunisian firm managers/owners between March 2013 and July 2014,[4] includes enterprises located in the

[3] These surveys are freely available for researchers and policymakers who can register online and access the raw data using the following link: http://www.enterprisesurveys.org/data/survey-datasets. As of August 2015, enterprise surveys have been conducted by the World Bank and its partners in 135 countries around the world.

[4] The Arab Spring which started in December 2010 was followed by several political incidents in the subsequent years. In fact, political instability peaked in 2012 (see Figure 2 below) when the disagreement between the secular opposition and the Islamic-led government intensified. Thus, it is plausible to assume that

following regions: Tunis (the capital), Sfax, Northeast, South Coast/West and Interior. It also covers firms that operate in the retail (10.6 percent), services (33.5 percent) and manufacturing (55.9 percent) sectors,[5] as well as small (36 percent), medium (41 percent) and large (23 percent) firms employing 5 to 19, 20 to 99, and more than 100 employees, respectively.

Moreover, the TES records several firm characteristics such as the size of a firm, its age and export activity, whether the firm is foreign owned, the manager's years of experience, his/her gender and education level and finally whether a firm received any subsidies from national or international institutions. Table A.1[6] in the Appendix lists the definitions and different categories corresponding to each firm characteristic. Another nice feature of the TES is that managers have reported (retrospectively) the actual sales figures of their corresponding companies for the years 2009 and 2012. This data allows us to measure firm performance as the real sales growth rate between 2009 and 2012. Given that the sales figures are reported in nominal terms, we deflate them using the Consumer Price Index (CPI) as published in the World Bank's World Development Indicator (WDI) database.[7] In addition, we trim the first and last two percentiles of the data in order to avoid outliers.[8] As a result, our sample is slightly reduced from 592 observations to 569. Table A.2 presents summary statistics of the above firm characteristics.

Most interestingly, the TES questionnaire asks firm managers to what extent the 17 possible business environment obstacles, presented in Table A.3, have an impact on the operations of firms. The main question used in the survey to gauge the perception of a firm manager towards a certain constraint is: "To what degree is constraint X an obstacle to the current operations of this establishment?" The answers to that question include a five-point scale ranging from "No Obstacle" coded as 0, "Minor Obstacle coded as 1, "Moderate Obstacle" coded as 2, "Major

---

firm managers would have had a better sentiment about the political situation in Tunisia when the TES data was collected (between March 2013 and July 2014) as the political instability decreased compared to 2012. If this assumption holds, then our results about the adverse effect about political instability on firm performance would likely be underestimated.

[5] Note that firms operating in the financial intermediation, renting, public and real estate sectors are not part of the TES.

[6] All tables and figures that start with an "A" are in the Appendix.

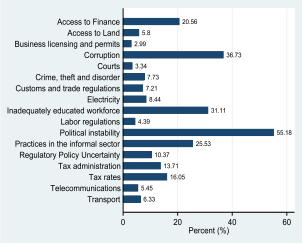
[7] Ideally, we would have deflated nominal sales using the Producer Price Index (PPI) as we are focusing on firms. Unfortunately, the Tunisian Institute of Statistics publishes monthly data regarding the Price Index of Industrial Sales (PIIS) starting from January 2014 only, which means we do not have data that covers our period of interest (2009-2012). However, the correlation between the yearly growth of CPI and that of the PIIS was 0.89 between January 2015 and December 2016, suggesting that using the PIIS instead of the CPI does not have a significant impact on our results. Moreover, both the CPI and the GDP deflator increased by 13.7 percent between 2009 and 2012; hence supporting our assumption that the CPI is a good variable to deflate the nominal sales figures.

[8] The original dataset included firms that had a real sales growth between 2009 and 2012 of more than 500 percent. These observations pushed the distribution to be extremely right skewed. Using the Shapiro–Wilk test we could reject the null hypothesis that the sales growth variable was normally distributed as the z statistic was 12.7. When we trimmed the first and last two percentiles of our data, the Shapiro–Wilk test still rejected the normality assumption, however with a much lower z statistic of 7.4 implying that variable sales growth is much closer to the normal distribution than before.

Obstacle" coded as 3, and "Very Severe Obstacle" coded as 4.[9] Figure A.1 illustrates the frequency distribution corresponding to each constraint.

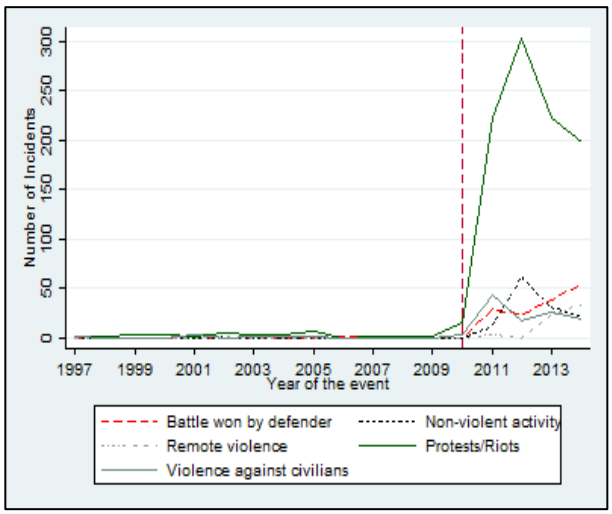
Figure 1 (below) presents the proportion of surveyed firms that considered each constraint as a major or very severe problem to their functioning. Political instability clearly stands out as the most worrying obstacle, with 55.2 percent of firms considering it as a major or very severe obstacle to their operations. This large percentage is not surprising given the surge in political instability events since the onset of the Tunisian revolution. In fact, the increase in political incidents is evident from Figure 2 which plots the actual number of conflict events that happened in Tunisia over time using data drawn from the Armed Conflict Location and Event Data Project (ACLED); a separate database than the TES.[10] For instance, the total number of protests/riots that took place during the period 2011-2014 increased by more than 18-fold compared to the period spanning from 1997 till 2010 (green line in Figure 2).

Figure 1: Proportion of firms considering the corresponding issue as a major or severe constraint



Source: TES and author's own calculations.

Figure 2: Actual number of political instability events in Tunisia over time



Source: ACLED database and author's own calculations.

Moreover, the results reported in Table A.3 cements our observation that Tunisian firms consider political instability to be the most severe obstacle to their day-to-day operations. Indeed, among the 17 obstacles, political instability had the highest average response of 2.4 (column 1). Even across different firm characteristics (size, exporting status, region, etc.), political instability was, by far, the most worrying constraint to Tunisian firms. This largely contrasts with obstacles such as access to land, business licensing and permits, courts, crime theft and disorder, customs and trade regulations, labor regulations, electricity, telecommunications and transport that had

[9] Two other possible answers to this question were "Don't know" and "Does not apply" coded respectively as -9 and -7. Given that these answers may distort our results, we recoded these observations as missing.

[10] A brief description of the ACLED database (Raleigh and Dowd, 2015; Raleigh et al., 2010) as well a definition for each conflict event reported in Figure 2 can be found in section SA.1 of the supplemental appendix which is attached to the published version of this paper.

an average response below 1, suggesting that firms did not perceive these issues as significantly disturbing to their functioning.

One possible drawback of our analysis is the use of subjective data as measures of firm constraints. According to Bertrand and Mullatinathan (2001), subjective measures used typically in surveys may be affected by general waves of optimism or pessimism which may induce a measurement error. In section SA.2 in the supplemental appendix of this paper, we show that the subjective measures used here are significantly correlated with their objective counterparts, hence overcoming this issue.

Notwithstanding this finding, we argue that the political instability constraint, which we are mostly interested in, and which does not have any objective counterpart in the TES, suffers from a measurement error. In particular, De Haan (2007) argued that political instability indicators tend to be measured with errors, because researchers usually focus on one dimension only (e.g. political violence, armed conflicts, civil protests, instability of the political regime, etc.), while in reality the concept of political turmoil is multidimensional as argued in the political science literature (Hibbs, 1973; Jong-A-Pin, 2009; Rummel, 1963; Tanter, 1966). Consequently, when the political instability measure is used as a right-hand side variable in a regression, the OLS coefficient is likely to be biased downwards (Hausman, 2001).

In addition, it is noteworthy to mention that the TES might suffer from a sample selection problem if firm exit because of the 2011 revolution was not random. While it is not possible to directly address this potential survivor bias given that the TES does not cover the pre-revolution period, we find no (observable) evidence, as detailed in section SA.3 in the supplemental appendix, in support of this bias.

3. Determinants of the Political Instability Constraint

In this section, we explore which Tunisian firms perceived political instability as a bigger obstacle to their operations after the Arab Spring uprisings. We use an ordered probit model since the dependent variable is a five-point ordinal variable that measures how firm managers perceive political instability.

To identify relevant explanatory variables, we present theoretical arguments on why certain firms might perceive political instability as a larger constraint than others. First, exporting firms might be more impacted by political instability as they become, during periods of political turmoil, less competitive vis-à-vis other international competitors due to higher costs of production and a degeneration of human capital skills (Collier and Duponchel, 2013). Second, small companies tend to perceive political instability as a bigger impediment to their operations, relative to large firms, because they have fewer resources to survive during periods of turmoil. In addition, small firms do not have a bargaining power as large firms in order to influence policy makers and obtain preferential treatments. For instance, during recessions, large enterprises "might threaten to lay off workers if they do not get tax reductions" (Schiffer and Weder, 2001, p. 4). Third, political instability would be a lesser constraint to firms with experienced managers

as such firms can find efficient solutions during periods of turmoil given that they already dealt with similar crisis in the past. As stated by Sayegh et al. (2004, p. 186) "a manager with past experience with events similar to the current crisis may have assumptions about the cause of the crisis through matching the current situation with his/her existing narrative schema, and thus might be able to make more effective decisions based on these assumptions". Fourth, firms in different sectors might perceive political instability as an obstacle differently. In particular, enterprises operating in the tourism sector are more vulnerable to higher levels of political instability as international tourism is a luxurious activity with a high income elasticity of demand (Lim, 1997).[11] For instance, tourists cancel, postpone or substitute their travel plans to more secure countries in the wake of political turmoil (Sönmez and Graefe, 1998). Fifth, higher levels of education allow individuals to cope more efficiently with sudden changes in the economic environment. For instance, Schultz (1975) argued that more educated farmers were more successful during periods of disequilibria and changing economic environments. Sixth, during periods of unrest, acts of vandalism and arson tend to increase and consequently firm productivity drops because these events are usually coupled with road blockades and damage to the infrastructure. Kamal and Kaiser (2015) showed that the Bengali readymade garment (RMG) sector was adversely impacted by acts of arson and vandalism that happened on the eve of the parliamentary elections in 2013.

To minimize any potential omitted variable bias, we add the following firm-level characteristics based on the existing literature that explored which firms tend to be more constrained by business obstacles:[12] firm age, foreign company (a dummy variable equals 1 if foreign individuals or companies hold at least 50 percent of the firm and 0 otherwise), manager's gender and subsidy (a dummy variable equals 1 if this establishment received any subsidies from the national international institutions and 0 otherwise).[13] Overall, we estimate the following ordered probit regression:

$$\begin{aligned} Pol\ Obst_i = \alpha + \beta_1.Size_i + \beta_2.Age_i + \beta_3.Exporter_i + \beta_4.Foreign_i + \beta_5.Manag\ \ Exp_i \\ + \beta_6.Manag\ Gen_i + \beta_7.Manag\ Educ_i + \beta_8.Subsidy_i + \beta_9.crime_i \\ + \boldsymbol{\gamma'}[\boldsymbol{sector}] + \varepsilon_i\ . \end{aligned} \quad (1)$$

In equation (1), the dependent variable $Pol\ Obst_i$, which ranges between 0 and 4, is higher the more firm i considers political instability as a constraint to its operations, while ε_i is a vector of independent and identically distributed error terms. To account for heteroscedasticity, we use

[11] The impact of terrorism, one of the facets of political instability, on tourism has been documented extensively in the literature (Drakos and Kutan, 2003; Llorca-Vivero, 2008; Neumayer, 2004).

[12] Kounouwewa and Chao (2011) and Vargas (2015) examined the determinants of financial obstacles, while Beck et al. (2005) examined the firm characteristics that can explain variation in the legal and corruption constraints to firms. Moreover, Carlin et al. (2006) explored the firm determinants of financing and customs regulation obstacles.

[13] As argued by Beck et al. (2005), the subsidy dummy can be used to capture the different market structures in which firms might operate.

robust standard errors. Moreover, ***sector*** is a vector of dummy variables that includes sector specific (food, other manufacturing, retail and services) fixed-effects.[14]

We are interested in the sign and statistical significance of the coefficients on each of the explanatory variables. A positive (negative) and significant coefficient means that firms with that given attribute consider political instability as a higher (lower) obstacle to their growth than firms that do not have this attribute. The estimation results of equation (1), displayed in specification 1 of Table 1, indicate, as suggested by the theoretical arguments, that firm size, manager's experience, exporting and touristic firms as well as firms that suffered from acts of vandalism and arson are all good predictors of the political instability constraint. We also find that firms operating in the food industry have a significantly negative coefficient, indicating that they are less concerned by political instability.

[14] The garment sector is the omitted category.

Table 1: Ordered Probit model of Political Instability regressed on firm characteristics

	Specification 1		Specification 2	
	Coefficient	AME(4)	Coefficient	AME(4)
Small	0.227**	0.066**	0.236**	0.068**
	(0.111)	(0.033)	(0.111)	(0.033)
Large	-0.161	-0.040	-0.175	-0.043
	(0.121)	(0.030)	(0.122)	(0.029)
Age	-0.001	-0.000	-0.000	-0.000
	(0.003)	(0.001)	(0.003)	(0.001)
Exporter	0.237**	0.065**	0.245**	0.067**
	(0.109)	(0.030)	(0.110)	(0.030)
Foreign	-0.193	-0.053	-0.190	-0.052
	(0.190)	(0.052)	(0.192)	(0.052)
Manag Exp	-0.012***	-0.003***	-0.011**	-0.003**
	(0.005)	(0.001)	(0.005)	(0.001)
Manag Gend	-0.060	-0.017	-0.074	-0.020
	(0.200)	(0.055)	(0.205)	(0.056)
Manag Educ	0.063	0.017	0.059	0.016
	(0.089)	(0.024)	(0.090)	(0.025)
Subsidy	0.008	0.002	-0.014	-0.004
	(0.135)	(0.037)	(0.136)	(0.037)
Food	-0.312**	-0.086**	-0.326**	-0.089**
	(0.158)	(0.044)	(0.160)	(0.044)
Other Manuf	-0.155	-0.043	-0.208	-0.057
	(0.162)	(0.044)	(0.162)	(0.044)
Retail	-0.073	-0.020	-0.081	-0.022
	(0.159)	(0.044)	(0.165)	(0.045)
Other Serv	0.077	0.021	0.066	0.018
	(0.157)	(0.043)	(0.160)	(0.044)
Tourism	0.521**	0.144**	0.447*	0.122*
	(0.264)	(0.072)	(0.262)	(0.071)
Losses due to crime (% of sales)	0.132***	0.036***	0.131***	0.036***
	(0.050)	(0.014)	(0.045)	(0.012)
Tunis			-0.119	-0.032
			(0.135)	(0.036)
Sfax			-0.103	-0.028
			(0.144)	(0.038)
South Coast/West			-0.047	-0.013
			(0.131)	(0.036)
Interior			0.430**	0.138**
			(0.192)	(0.065)
Observations	555	555	555	555

Notes: Robust standard errors in parentheses. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively. The dependent variable is the political instability constraint which takes five values ranging from 0 to 4. The omitted categories are medium firms and the garment sector. Losses due to crime (% of sales) denote the estimated losses as a result of theft, robbery, vandalism or arson that occurred on the firm's premises as a percentage of total annual sales in 2012. Columns 2 and 4 represent the average marginal effects (AME) on the probability that firms considering political instability as a major constraint to their operations.

Given that the standard coefficients generated from the ordered probit model are not easily interpretable from an economic perspective, we estimate the Average Marginal Effects (AMEs) of firms considering political instability as a very severe constraint to their operations.[15] The results reported in column 2 of Table 1, suggest that exporting firms and those that operate in the tourism sector are, on average, 6.5 and 14.4 percent more likely to perceive political instability as a very severe obstacle to their growth, respectively.[16] In contrast, firms in the food industry sector are 8.6 percent less likely to perceive political instability as a very severe obstacle. The first two columns of Table 1 also indicate that the perception of firms toward political instability relates negatively to firm size, with smaller (larger) firms reporting it as a higher (lower) constraint.[17] This relation is, however, only significant for small firms which face a 6.6 percent higher probability of perceiving political instability as a very severe obstacle.[18] Furthermore, a 1 percentage point increase in losses resulting from crime actions (vandalism, arson, etc.) is associated with a 3.6 percent higher likelihood of considering political instability as a very severe obstacle. The results also show that firms managers who have 10 more years of work experience are, on average, 3 percent less likely to perceive political instability as a very severe constraint. Meanwhile, the gender of a manager, his/her education level, as well as the age of the firm and whether it receives a subsidy or is owned by foreigners are not statistically significant do not explain how firms perceive political instability.

As argued by Collier and Duponchel (2013), firms operating in regions of high conflict intensity are the most affected by a conflict. To examine whether firms are concerned about political instability across different regions, we introduce regional dummies to equation (1). Columns 3 and 4 of Table 1 present, respectively, the estimation results and corresponding AMEs of that model which we denote by specification 2. While the sign and statistical significance of earlier results are unchanged, only the coefficient on the dummy variable corresponding to the interior region is significantly correlated with how firms perceive political instability. In terms of magnitude, firms in the interior region are, on average, 13.8 percent more likely to perceive political instability as a very severe obstacle to their growth. This large association is not surprising given that the interior region, which was economically and socially

[15] The average marginal effects coefficients can be interpreted as the probability of a firm reporting a 4 (very severe) on political instability for a one unit increase in the corresponding explanatory variable.

[16] It might also be the case that exporting firms were negatively affected by the economic conditions in the destination market. In particular, Libya, which accounted for 4.5 percent of Tunisian exports in 2010, experienced a major economic downturn following the conflict that started in 2011 and toppled Muammar Gaddafi. As a result, Tunisian firms that used to export Libya would have been adversely affected by the Libyan conflict. Unfortunately, we cannot capture this possible channel using the TES because it does not record the export destination of each firm.

[17] The medium size firms are the omitted category.

[18] There are two potential explanations why small firms might perceive political instability as a bigger constraint. One possibility is that small companies are impacted by a different treatment in the sense that they might be closer in distance to riots and violent incidents. Unfortunately, the TES dataset does not reveal the geocoded data corresponding to each firm, preventing us from testing this hypothesis. Another possibility, which we presented above, is that during prolonged periods of political instability, small companies have fewer financial resources to survive. Further research, based on more disaggregated data, is required to distinguish between these propositions.

marginalized relative to the coastal areas, experienced the highest number of political instability events since the revolution erupted early 2011 as presented in Figure A.2 which illustrates the spatial distribution of the number political incidents in Tunisia between 2011 and 2014.[19] In particular, the interior region includes two cities that were at the heart of the Jasmine revolution: Sidi Bouzid which was the birthplace of the Tunisian revolution from which protests against Ben Ali's regime commenced after Mohamed Bouazizi set himself on fire in its streets on 17 December 2010; and Gafsa city, the mining capital of Tunisia, which was hit severely in the aftermath of the revolution as protests, by poor citizens demanding jobs and higher living standards, paralyzed the mining industry which accounted for 9.2 percent of total exported goods in 2010.[20] Moreover, this result is consistent with the literature on the determinants of political unrest, which finds that instability events occur more often when people feel marginalized because of extreme poverty (Miguel, 2007) and/or high youth unemployment (Azeng and Yogo, 2013; Urdal, 2006).[21]

To sum up this section, our results show that political instability was a major concern for small and exporting firms as well as those that were operating in the tourism sector, those that suffered from acts of vandalism or arson and those that were located in the interior region of Tunisia.

4. The Most Damaging Constraint to Firm Growth

This section examines which business environment constraint was the most damaging to firm growth in Tunisia during the post-revolutionary period.

4.1 Main Results

In this paper, we define an obstacle to be damaging if it has a statistically significant and negative impact on firm growth which we define as the real growth in firm sales between 2009 and 2012. We start by determining which out of the seventeen business environment obstacles, reported in Table A.3, are damaging using a general-to-specific modelling strategy. In particular,

[19] In the ACLED database, data about the number political instability events (protests, attacks against civilians, remote violence, non-violent activity and battle won by defender) were reported at the governorate level (there are 24 governorates in Tunisia), while data in the WEBS were stratified into five regions. To merge the two datasets, we refereed to the "Tunisia 2013 Enterprise Surveys Data Set Implementation Report" that describes the governorates included in each of the five regions.

[20] "According to the Compagnie des phosphates de Gafsa (CPG), phosphate production was only 2.5 million tons in 2011, compared to 8 million in 2010. The amount of phosphate fell to under 3 million"(African Development Bank, 2012, p. 5). In addition, firms operating in Gafsa may have another reason for considering political instability as an obstacle to their functioning as the city experienced a major revolt in 2008 (against unfair hiring practices by the state-run Gafsa Phosphate Company) that turned sometimes into riots and was then brutally repressed by Ben Ali's regime (Beinin, 2016).

[21] Young and unemployed people are also used by political parties to cause trouble in return for money. In the case of Bengladesh, Shonchoy and Tsubota (2016, p. 6) states that "political parties hire people, mostly those who are relatively young, poor, unemployed and want to make quick money. These paid supporters occupy the major streets of the city and terrorize ordinary citizens and businesses with blockades, violence, and other forms of intimidation".

we regress sales growth on all the different obstacles while controlling for various firm characteristics, and then eliminate the constraint with the highest positive (or lowest negative) t-ratio, one at a time, until we end up with only negative and statistically significant coefficients. Econometrically speaking, our OLS regression is:

$$Firm\ Growth_i = \alpha + \boldsymbol{\theta}'[\boldsymbol{Potential\ Constraints}] + \boldsymbol{\delta}'[\boldsymbol{FC}] + \varepsilon_i \qquad (2)$$

where $[\boldsymbol{Potential\ Constraints}]$ is a vector that includes the seventeen potential constraints; $[\boldsymbol{FC}]$ is a vector of controls containing various firm characteristics that have been extensively used in the literature to examine the determinants of firm performance:[22] firm age (and age squared), the export activity of the firm, its legal status, whether it is foreign owned, the percentage of the firm owned by the government, and the manager's years of experience, his/her education level and gender. Consequently, a constraint $c = 1, \dots, 17$ is damaging to firm growth if its corresponding coefficient θ_c is negative and statistically significant. Table 2 (below) reports the estimation results of equation (2). Due to space constraints, we do not report all the stages of the general-to-specific strategy.[23] Column 1 shows that when we regress sales growth rate on all the obstacles, access to finance, political instability and tax administration yield significantly negative coefficients. However, column 3 shows that, after adopting the general-to-specific strategy, only the coefficients on access to finance and political instability remain negative and statistically significant, implying that these two constraints are damaging to firm growth.[24] Subsequently, the most damaging obstacle would be the one that has the largest coefficient in absolute value. When normalizing the results, we find that a one standard deviation increase in the access to finance and political instability constraints is associated with a 2.6 and 3.2 percent decrease in sales growth, respectively; suggesting that the latter is the most damaging obstacles to firms.[25]

However, our OLS results might suffer from two possible sources of biases: measurement error and reverse causality. As explained in section 2, the political instability constraint may be measured with error as firm managers may not consider all the dimensions of political instability when answering the surveyor's question. Moreover, a reverse causality bias may exist as low performing firms tend to report more stringent constraints whereas successful firms have the necessary resources to overcome certain obstacles and improve the business environment (Dethier et al., 2011). To overcome these endogeneity issues and taking into account the data

[22] See for example, Aterido et al. (2011), Beltrán (2016), Krauss (2015) and Pfeifer (2015).

[23] All the regression details of the general-to-specific strategy are available in Table A.5 in the appendix. Notice that the coefficient for the customs and trade regulations obstacle falls out after the first regression because it had the highest t-ratio.

[24] As shown in column (4) of Table A.5, the coefficient on tax administration becomes statistically insignificant after omitting tax rates. This is likely due to a multicollinearity problem as the correlation between these two variables was 0.75

[25] The effect of a one standard deviation increase in each constraint on sales growth is calculated by dividing the estimated coefficient with the corresponding deviation around that number as reported in Table 2. For instance, the -3.2 effect of a one standard deviation increase in political instability is calculated as -4.72/1.47.

limitations (e.g. the cross-sectional nature of the TES) which do not allow us to control for firm-fixed effects and deal with any potential survivor bias, we employ an Instrumental Variable (IV) estimation strategy.

Despite the richness of the TES, finding reliable instruments is challenging. As a solution, we employ region-sector-size averages as benchmark firm-specific instruments. This approach, which has been introduced by Friedman (1957) and reviewed by Angrist and Krueger (2001), is a widely recognized practice in the literature (Amissah and Stack, 2016; Ayyagari et al., 2008; Beltrán, 2016; De Rosa et al., 2010; De Waldemar, 2012; Desai and Olofsgård, 2011; Fisman and Svensson, 2007) to address endogeneity problems when using perception based measures as explanatory variables. In taking grouped averages, it is unlikely that a firm's individual performance affects the perception of other companies within the same group (region-sector-size), implying that the "direction of causality is likely to run from the average obstacles to individual firms, not vice versa" (Ayyagari et al., 2008, p. 499); satisfying the exclusion restriction assumption. At the same time, it is likely that firms operating in the same environment (region-sector-size) have similar perceptions towards certain business obstacles. Hence, we expect our constructed instruments to be significantly correlated with individual firm perceptions; satisfying the strong instrument assumption. Moreover, taking group averages helps minimize potential measurement errors which are generally firm specific, thus uncorrelated with the average constraint values (Angrist and Krueger, 2001; Fisman and Svensson, 2007).

Table 2: Impact of Obstacles on Sales Growth

	OLS			IV	
	(1)	(2)	(3)	(4)	(5)
Acc Fina	-4.449***	-3.571***	-3.586***	-6.564**	-6.493**
	(1.350)	(1.339)	(1.273)	(2.744)	(3.204)
Acc Land	-1.967	-1.350			
	(2.018)	(2.039)			
Licen and Perm	-1.296				
	(2.484)				
Corrup	1.454				
	(1.507)				
Courts	0.266	1.435			
	(2.539)	(2.518)			
Crime	0.443				
	(2.206)				
Cust and Trd Reg	5.901***				
	(1.896)				
Inadeq Workfor	-0.682	1.037			
	(1.381)	(1.296)			
Labor Regul	3.584*				
	(2.173)				
Pol Inst	-6.177***	-4.725***	-4.317***	-10.935***	-10.920***
	(1.658)	(1.477)	(1.387)	(2.961)	(3.366)
Reg Policy Uncert	-3.059*	-0.423			
	(1.822)	(1.656)			
Informal Compet	0.693				
	(1.239)				
Tax Admin	-4.362*	-0.350			
	(2.288)	(1.510)			
Tax Rates	4.561**				
	(2.293)				
Elec	-1.050	2.024			
	(1.678)	(1.498)			
Telecom	3.470				
	(2.583)				
Transp	2.233				
	(2.020)				
Additional Controls	Yes	Yes	Yes	Yes	Yes
Observations	518	520	520	520	498
F-test (Access to Finance regression)				88.4	41.9
F-test (Political Instability regression)				75.6	31.0
Overidentifcation test (p-value)					0.77

Notes: Robust standard errors in parentheses. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively. The dependent variable is the real firm sales growth rate between 2009 and 2012. In all regressions, the set of firm characteristics includes: the firm age (and age squared), its export activity, its legal status, whether it is foreign owned, the percentage of the firm owned by the government, and the manager's years of experience, his/her education level and gender. The endogenous variables are the political instability and access to finance constraints. In column 4 the region-sector-size average of each endogenous variable is used as a respective instrument. In column 5 we add the following two instruments: (i) the firm losses as a percentage of annual sales resulting from crime events (vandalism, arson, etc.) and (ii) the region-sector-size average of the access to finance objective measure.

The results for the IV regression are reported in column 4 of Table 2. The F-statistics for both first-stage regressions are higher than 10 (the Staiger and Stock (1997) rule of thumb below which instruments are considered to be weak), suggesting that both instruments are strong. Moreover, the first-stage regressions, reported in panel A of Table A.6, show positive and highly significant relationships between each instrument and its respective endogenous variable. Most importantly, the coefficient on political instability remains statistically significant at the 1 percent level while that on access to finance loses some significance. In addition, the magnitude of the former becomes much larger than the latter reinforcing our main finding that political instability was the most damaging constraint to firm growth in Tunisia after the Arab Spring.

Notice that compared to the OLS results (column 3), the magnitudes of the coefficients corresponding to the financing and political instability obstacles have increased with the IV. (column 4). While the increase is relatively small for the former constraint, the large difference in magnitude between the OLS and IV coefficients on political instability is not surprising as this variable is measured with error, therefore leading to an attenuation bias in the OLS results.

To test the exogeneity of the instruments using the Sargan test of overidentifying restrictions, we add one potential instrument for each endogenous variable. The additional instruments are objective measures, thereby reducing further any measurement error (Aterido et al., 2011; Krauss, 2015). For the political instability constraint, we use firm losses as a percentage of the 2012 annual sales stemming from crime events (vandalism, arson, theft, etc.).[26] As shown in Table 2, this measure is significantly positively correlated with the political instability constraint; hence satisfying the strong instrument assumption. Moreover, crime events are likely to be exogenous with respect to firm characteristics, as these incidents are often associated with mass protests and riots that happen at the regional and national levels without necessarily targeting firms specifically (Roberts, 2012; Roman, 2013; Tadjoeddin, 2013).[27] Therefore, we argue that this instrument satisfies the exclusion restriction assumption.

[26] An ideal instrument for the subjective political instability measure would have been the actual number of protests and strikes that happened in Tunisia after the revolution at a spatial level. As mentioned in section 3.5, we tried to use the number of protests, strikes and riots from the ACLED database; however, the two datasets could only be merged at the regional level which boils down to 5 regions (hence 5 observations), preventing us from exploiting spatial variation. Moreover, the variable (a3x) which represents the "Name of city/town/village" was missing from the TES database. We contacted the World Bank Enterprise Survey team to explore whether we can have access to this data but their response was the following: *"Due to our protocols to ensure respondent confidentiality, the values for a3x are not published as it would make several respondent firms directly identifiable in the data"*. As a simple exercise, the correlation between the subjective political instability measure (from the TES) and the actual number of political instability events (from the ACLED database) for the 5 matched regions was positive (0.3) and statistically significant at the 1 percent level, suggesting that the relationship between these two variables is relatively strong.

[27] In the Tunisian case, anecdotal evidence suggests that acts of vandalism did not target specific firms; rather they happened during protests against high unemployment rates and poverty levels. For example, the following articles document some acts of vandalism during mass protests that occurred in the aftermath of the 2011 revolution: (i) http://news.yahoo.com/tunisia-announces-nationwide-curfew-protests-000037792.html and (ii) http://english.alarabiya.net/articles/2013/01/13/260237.html and (iii)

The additional possible instrument for access to finance is the region-sector-size average of the reason why a firm did not apply for commercial bank loan.[28] Table SA.1 in the supplemental appendix demonstrates that this objective measure is significantly positively correlated with the financing constraint reported by firm managers, implying that companies which did not need to apply for a loan because they had sufficient internal resources did not consider access to finance as an impediment to their functioning; hence satisfying the strong instrument assumption. Moreover, and as argued above, taking the region-sector-size average helps minimize endogeneity issues as individual characteristics of firms are not directly impacted by obstacles aggregated at the group level.

While one of the two additional instruments do not enter significantly in the first-stage regressions presented in columns panel B of Table A.6, the coefficients on both variables are positive and in line with our expectations. The F-statistic, governing the joint significance off the instruments (presented at the bottom of column 5 in Table 2) remains well above 10, therefore justifying the inclusion of the new instruments. In addition, the Cragg-Donald minimum eigenvalue statistic also suggests that the null of weak correlation between the instruments and the endogenous variables is rejected since the calculated value (19.2) is greater than the tabulated critical values (16.9 at the 10 percent level). More importantly, the overidentifying restrictions test indicates that the null of instruments' endogeneity cannot be rejected as the p-value was 0.77. Overall, the results, based on this larger pool of instruments, corroborate our main finding that political instability was the most damaging constraint to firm growth in Tunisia after the Arab Spring.

4.2 Robustness Analysis

In what follows, we perform two robustness checks to test the sensitivity of our results. First, we explore whether our baseline results are sensitive to using employment growth as a measure of firm performance[29] by replicating the same regressions as equation (2), this time considering employment growth between 2009 and 2012 as the dependent variable.[30] The results of this test are reported in Table A.7. Following the general-to-specific strategy we find, as indicated in columns 1, 2 and 3, that the damaging constraints to employment growth are political instability and an inadequately educated workforce. The latter, however, is only significant at the 10 percent level and its coefficient is half of the former. This result, which suggests that political instability is also the most damaging constraint to employment growth, is confirmed when taking care of

http://www.economist.com/news/middle-east-and-africa/21567991-economic-neglect-menacing-fragile-new-democracy-democracy-and-riots.

[28] The definition of the objective measure corresponding to the access to finance obstacle is available in Table A.4 in the appendix.

[29] Dollar et al. (2005), Hallward-Driemeier et al. (2006), Aterido et al. (2011), Trentini and Koparanova (2013) and Stel and Naudé (2016) have all considered employment growth as an alternative/complementary measure of firm performance.

[30] Our measure of employment at year 2009 and 2012 is the number of full-time employees at the end of the year.

endogeneity using region-sector-size averages and firm losses as a percentage of the 2012 annual sales stemming from crime events as firm specific instruments. In both IV specifications (columns 4 and 5), the coefficient on the inadequately educated force becomes insignificant while that on political instability remains strongly significant and its magnitude increases. Most importantly, these results indicate that, irrespective of how firm growth is measured, political instability was the most damaging constraint to firm performance.

Second, and while the main results (section 4.1) determine which constraint was the most damaging to Tunisian firms, they do not inform us whether firms reacted differently to different business constraint levels. To tackle this question, we re-estimate the regressions presented in columns 3 and 5 of Table 2 while focusing on disaggregating each damaging constraint (access to finance and political instability) into three separate dummy variables: no obstacle (equals 1 if firm i did not consider issue X as a constraint), small obstacle (equals 1 if firm i considers issue X a minor constraint) and big obstacle (equals 1 if firm i considers issue X as moderate, major or very severe constraint).[31] The results reported in Table A.8 suggest that Tunisian firms can cope with low levels of political instability and financing constraints. What is noticeable, however, is that higher levels of political instability amplified the adverse impact on firm growth.[32] To compare the appropriateness between the aggregated model (Table 2) and the one with grouped dummies (Table A.8), the J and Cox-Pesaran statistics are used.[33] Considering the financing constraints, both statistics indicate that the two models should not be rejected as their p-values are higher than 10 percent. On the other hand, when focusing on political instability, the model with disaggregated levels seems to be the preferred one.[34] Consequently, we conclude that the disaggregated level is more useful in explaining how firm growth is impacted by political instability.

In sum, our two robustness tests confirm that political instability was the most damaging constraint to Tunisian firms after the Arab Spring.

5. Conclusion

This paper has examined the previously unexplored implications of political instability on firm growth in the context of Tunisia after the Arab Spring. Using firm-level data drawn from the TES, we initially investigated which firms perceived political instability as an impediment to their operations and then analyzed which business constraint was the most damaging to firm growth.

---

[31] The No Obstacle category was omitted.

[32] Unfortunately, the survey does not provide details about the different dimensions of political instability, which prevents us from determining which dimension (e.g. political violence, armed conflicts, civil protests, instability of the political regime, etc.) is the most damaging to Tunisian firms.

[33] The J and Cox-Pesaran statistics are usually used to compare the appropriateness between two non-nested models.

[34] For the political instability constraint, the p-values of the J and Cox-Pesaran were, respectively, 0.06 and 0.02 (0.54 and 0.27) for the aggregated (disaggregated) model.

We have presented evidence that political instability was a major concern for small and exporting firms as well as those that were operating in the tourism sector, those that suffered from acts of vandalism or arson and those that were located in the interior region of Tunisia. Most importantly, we have found that political instability was the most damaging constraint to firm growth in Tunisia after the Arab Spring. There are several potential channels by which political instability could have affected Tunisian firms. One possibility is that the protracted period of transition from an autocratic to a democratic regime has increased the uncertainty about the future political and economic agendas and therefore induced companies to postpone their investment decisions. This is quite possible as the Investment Profile Index dropped from 8.5 on the eve of the revolution to 6 in 2013, hence indicating that the risk associated with investing in Tunisia increased significantly following the revolution.[35] A second potential channel is the marked increase in protests and strikes since the onset of the Jasmine revolution which has (i) reduced firm productivity as such incidents tend to disrupt the production process due to workers' absenteeism (Krueger and Mas, 2004; Mas, 2008) and (ii) increased the cost of production (Shonchoy and Tsubota, 2016). A third related channel is that nationwide mass civil protest usually create distractions to both workers and managers, thus diverting the attention away from their regular job duties (Ashraf et al., 2015).

Our findings have some policy implications. Traditionally, the challenge of firm growth is tackled through a technical and apolitical lens. However, our analysis provides evidence that, when it comes to revolution-torn countries, policy makers should first and foremost shield the economy against destabilizing political and security incidents. Specifically, Tunisian policymakers should focus on reducing political instability in regions that were the most affected by it (e.g. the interior region in our case) through tackling its root causes such as high unemployment rates, regional disparities and income inequalities which are argued to be the main reasons behind the uprisings in the interior region. According to El-Khawas (2012, p. 7), "unemployment was more than 22 percent in Kasserine and Gafsa in the interior, regions that were among the first to challenge the regime".[36] In addition, the Tunisian authorities are encouraged to develop policies aimed at targeting small and exporting firms as well as those that are operating in the tourism sector as these firms are found to be the most affected during periods of high political instability. However, the implementation of such policies should be carefully designed and coupled by clear and institutionalized checks and balances that would prevent the recurrence of practices of crony capitalism such as the interventionist industrial and economic policies that mainly benefitted firms close to the Ben Ali regime before the revolution occured (Rijkers et al., 2014).

[35] The Investment Profile Index is a measure of the factors affecting the risk to investment. A score of 12 indicates a very low risk, while a score of 0 suggests a very high risk.

[36] "Regional disparities were very large: (i) average poverty rates remained 3 times as high in the interior of the country than in richer coastal "offshore" areas; (ii) at 25 percent, unemployment rates in the interior regions were double those of coastal areas; and (iii) only 13 percent of foreign firms were created in the interior regions." (IMF, 2015, p. 22).

Unfortunately, this study suffered from two main data limitations. First, in terms of quality, we only have a multidimensional measure of political instability, which prevents us from testing whether the relationship between political turmoil and firm growth varies across different dimensions of instability (e.g. political violence, armed conflicts, civil protests, instability of the political regime, etc.). Second, in terms of quantity, we do not have firm-level data prior to the revolution. This has prevented us from using panel-econometric techniques which would have enabled us to account for firm fixed effects and potential survivor biases.

Finally, and while this study was focused on Tunisia, its findings may be relevant to other countries that experienced a long and protracted period of transition from one political regime to another. However, due to the geo-political, cultural and historical specificities of the Arab world, we recognize that political instability in the MENA region is a complex issue which needs more research to understand its causes, dynamics and economic implications, particularly following the recent uprisings.

Acknowledgements

We would like to thank seminar participants at the Fourth International Conference on Applied Research in Economics and Finance (Essex, 2016), the Economic Research Forum's 23 Annual Conference (Amman, 2017), and the CSAE Conference 2017 (Oxford, 2017). Valuable comments from Oliver Morrisey, Anke Hoeffler, David Fielding, Cecilia Testa and Nancy Claire Benjamin are also gratefully acknowledged. Finally, we would like to thank the editor Andy McKay and an anonymous referee for their very useful comments which have improved the paper. Any remaining errors are ours.

Supplemental Appendices

Supplementary appendices are available at the website of *Review of Economic Studies*.

References

African Development Bank. (2012). *African Economic Outlook 2012: Tunisia.*

Amissah, E., & Stack, M. (2016). The Presence of Foreign Firms in Ghana: The Role of Physical, Financial, and Governance Infrastructure. *International Growth Center F-33208-GHA-1.*

Angrist, J. D., & Krueger, A. B. (2001). Instrumental Variables and the Search for identification: From Supply and Demand to Natural Experiments. *Journal of Economic Perspectives*, *15*(4), 69–85. http://doi.org/10.1257/jep.15.4.69

Arieff, A., & Humud, C. (2015). *Political Transition in Tunisia. Congressional Research Service.*

Ashraf, A., Macchiavello, R., Rabbani, A., & Woodruff, C. (2015). The Effect of Political and Labour Unrest on Productivity: Evidence from Bangladeshi garments. *International Growth Center Working Paper, December 2015.*

Aterido, R., Hallward-Driemeier, M., & Pages, C. (2011). Big Constraints to Small Firms' Growth? Business Environment and Employment Growth across Firms. *Economic Development and Cultural Change*, *59*(3), 609–647. http://doi.org/10.1086/658349

Ayyagari, M., Demirgüç-Kunt, A., & Maksimovic, V. (2008). How Important Are Financing Constraints? The Role of Finance in the Business Environment. *World Bank Economic Review*, *22*(3), 483–516. http://doi.org/10.1093/wber/lhn018

Azeng, T. F., & Yogo, T. U. (2013). Youth Unemployment and Political Instability in Selected Developing Countries. *African Development Bank Group Working Paper Series No. 171.*

Batra, G., Kaufmann, D., & Stone, A. H. W. (2003). *Investment Climate Around the World: Voices of the Firms from the World Business Environment Survey.* Washington D.C.: World Bank.

Beck, T., Demirgüç-Kunt, A., & Maksimovic, V. (2005). Financial and Legal Constraints to Growth: Does Firm Size Matter? *The Journal of Finance*, *60*(1), 137–177. http://doi.org/10.1111/j.1540-6261.2005.00727.x

Beinin, J. (2016). Political Economy and Social Movement Theory Perspectives on the Tunisian and Egyptian Popular Uprisings of 2011. *LSE Middle East Centre Paper Series 14.*

Beltrán, A. (2016). Does Corruption Increase or Decrease Employment in Firms? *Applied Economics Letters*, *23*(5), 361–364. http://doi.org/10.1080/13504851.2015.1076137

Bertrand, M., & Mullainathan, S. (2001). Economics and Social Behavior: Do People Mean What They Say? Implications for Subjective Survey Data. *American Economic Review*, *91*(2), 67–72. http://doi.org/10.1257/aer.91.2.67

Brück, T., Justino, P., Verwimp, P., Avdeenko, A., & Tedesco, A. (2016). Measuring Violent Conflict in Micro-Level Surveys: Current Practices And Methodological Challenges. *World Bank Research Observer*, *31*(1), 29–58. http://doi.org/10.1093/wbro/lkv011

Carlin, W. J., Schaffer, M. E., & Seabright, P. (2006). Where are the Real Bottlenecks? A Lagrangian Approach to Identifying Constraints on Growth from Subjective Survey Data. *Centre for Economic Reform and Transition: Discussion Paper 2006/04.*

Collier, P., & Duponchel, M. (2013). The Economic Legacy of Civil War: Firm-level Evidence from Sierra Leone. *Journal of Conflict Resolution*, *57*(1), 65–88. http://doi.org/10.1177/0022002712464847

Contessi, S., & De Nicola, F. (2013). What Do We Know about the Relationship between Access to Finance and International Trade? *Federal Reserve Bank of St. Louis Working Paper Series 2012-054B*.

Darina Kamal, R., & Abdullah Kaiser, Z. R. . (2015). RMG in Bangladesh: A Study into the Effects of pre-Election (2014) Political Turmoil. *Foreign Trade Review*, *50*(2), 135–147. http://doi.org/10.1177/0015732515572060

De Haan, J. (2007). Political Institutions and Economic Growth Reconsidered. *Public Choice*, *131*, 281–292. http://doi.org/10.1007/s11127-007-9172-y

De Rosa, D., Gooroochurn, N., & Görg, H. (2010). Corruption and Productivity: Firm-Level Evidence from the BEEPS Survey. *Policy Research Working Paper Series 5348*, (June). http://doi.org/10.1596/1813-9450-5348

De Waldemar, F. S. (2012). New Products and Corruption: Evidence from Indian Firms. *The Developing Economies*, *50*(3), 268–284. http://doi.org/10.1111/j.1746-1049.2012.00171.x

Desai, R. M., & Olofsgård, A. (2011). The Costs of Political Influence: Firm-Level Evidence From Developing Countries. *Quarterly Journal of Political Science*, *6*, 137–178. http://doi.org/10.1561/100.00010094

Dethier, J. J., Hirn, M., & Straub, S. (2011). Explaining Enterprise Performance in Developing Countries With Business Climate Survey Data. *World Bank Research Observer*, *26*(2), 258–309. http://doi.org/10.1093/wbro/lkq007

Dollar, D., Hallward-Driemeier, M., & Mengistae, T. (2005). Investment Climate and Firm Performance in Developing Economies. *Economic Development and Cultural Change*, *54*(1), 1–31. http://doi.org/10.1086/431262

Drakos, K., & Kutan, A. M. (2003). Regional Effects of Terrorism on Tourism in Three Mediterranean Countries. *The Journal of Conflict Resolution*, *47*(5), 621–641. http://doi.org/10.1177/0022002703258198

El-Khawas, M. a. (2012). Tunisia's Jasmine Revolution: Causes and Impact. *Mediterranean Quarterly*, *23*(4), 1–23. http://doi.org/10.1215/10474552-1895357

Fisman, R., & Svensson, J. (2007). Are Corruption and Taxation Really Harmful to Growth? Firm level Evidence. *Journal of Development Economics*, *83*(1), 63–75. http://doi.org/10.1016/j.jdeveco.2005.09.009

Hallward-Driemeier, M., & Aterido, R. (2009). *Comparing Apples with.... Apples: how to make (more) sense of subjective rankings of constraints to business. World Bank Policy Research Working Paper 5054*.

Hallward-Driemeier, M., Wallsten, S., & Colin Xu, L. (2006). Ownership, Investment Climate and Firm Performance: Evidence from Chinese Firms. *Economics of Transition*, *14*(4), 629–647. http://doi.org/10.1111/j.1468-0351.2006.00267.x

Hausman, J. (2001). Mismeasured Variables in Econometric Analysis: Problems from the Right and Problems from the Left. *Journal of Economic Perspectives*, *15*(4), 57–67. http://doi.org/10.1257/jep.15.4.57

Hibbs, D. (1973). *Mass Political Violence: A Cross-National Causal Analysis*. (Wiley, Ed.). New York.

International Monetary Fund. (2015). *Tunisia: Article IV Consultation, Country Report No. 15/285*. Washington D.C.

Jong-A-Pin, R. (2009). On the Measurement of Political Instability and Its Impact on Economic Growth. *European Journal of Political Economy*, *25*(1), 15–29. http://doi.org/10.1016/j.ejpoleco.2008.09.010

Kounouwewa, J., & Chao, D. (2011). Financing Constraints Determinants in African Countries. *The International Journal of Applied Economics and Finance*, *5*(1), 30–45. http://doi.org/10.3923/ijaef.2011.30.45

Krauss, A. (2015). Creating and Destroying Jobs Across East Asia Pacific: A Country-Level Analysis on Wages, Exports, Finance, Regulation and Infrastructure. *IZA Journal of Labor and Development*, *4*(10), 1–29. http://doi.org/10.1186/s40175-015-0032-8

Krueger, A. B., & Mas, A. (2004). Strikes, Scabs, and Tread Separations: Labor Strife and the Production of Defective Bridgestone/Firestone Tires. *Journal of Political Economy*, *112*(2), 253–289. http://doi.org/10.1086/381479

Lim, C. (1997). Review of International Tourism Demand Models. *Annals of Tourism Research*, *24*(4), 835–849. http://doi.org/10.1016/S0160-7383(97)00049-2

Llorca-Vivero, R. (2008). Terrorism and International Tourism: New Evidence. *Defence and Peace Economics*, *19*(2), 169–188. http://doi.org/10.1080/10242690701453917

Mas, A. (2008). Labour Unrest and the Quality of Production: Evidence From the Construction Equipment Resale Market. *Review of Economic Studies*, *75*(1), 229–258. http://doi.org/10.1111/j.1467-937X.2007.00461.x

Matta, S., Appleton, S., & Bleaney, M. (2016). The Impact of the Arab Spring on the Tunisian Economy. *World Bank Economic Review (Forthcoming)*. http://doi.org/https://doi.org/10.1093/wber/lhw059

Miguel, E. (2007). Poverty and Violence: An Overview of Recent Research and Implications for Foreign Aid. In *Too Poor for Peace? Global Poverty, Conflict and Security in the 21st Century* (pp. 50–59). Washington D.C.: Brookings Institution Press.

Milton, F. (1957). *Theory of the Consumption Function*. Princeton, New Jersey: Princeton University Press.

Neumayer, E. (2004). The Impact of Political Violence on Tourism. *Journal of Conflict Resolution*, *48*(2), 259–281. http://doi.org/10.1177/0022002703262358

Pfeifer, C. (2015). The Nexus Between Top Managers' Human Capital and Firm Productivity. *Applied Economics Letters*, *22*(12), 982–986. http://doi.org/10.1080/13504851.2014.993128

Pierre, G., & Scarpetta, S. (2004). Employment Regulations through the Eyes of Employers: Do they Matter and How do Firms Respond to them? *IZA Discussion Paper No. 1424*. http://doi.org/dx.doi.org/10.1596/1813-9450-3463

Raleigh, C., & Dowd, C. (2015). *Armed Conflict Location and Event Data Project (ACLED) Codebook. ACLED*.

Raleigh, C., Linke, A., Hegre, H., & Karlsen, J. (2010). Introducing ACLED: An Armed Conflict Location and Event Dataset: Special Data Feature. *Journal of Peace Research*, *47*(5), 651–660. http://doi.org/10.1177/0022343310378914

Rijkers, B., Freund, C., & Nucifora, A. (2014). The Perils of Industrial Policy Evidence from Tunisia. *Mimeo, the World Bank*.

Roberts, A. (2012). Why the Occupy Movement Failed. *Public Administration Review*, *72*(5),

754–762. http://doi.org/10.111/j.1540-6210.2012.02614.x.e

Roman, A. (2013). The Class Cleavage, Minority Influence, and Brazil's 2013 Protests. *Paper Prepared for the 2013 ECPR General Conference.*

Rummel, R. (1963). Dimensions of Conflict Behavior Within and Between Nations. *General Systems Yearbook*, *8*, 1–50.

Sayegh, L., Anthony, W. P., & Perrewé, P. L. (2004). Managerial Decision-Making Under Crisis: The Role of Emotion In An Intuitive Decision Process. *Human Resource Management Review*, *14*(2), 179–199. http://doi.org/10.1016/j.hrmr.2004.05.002

Schiffer, M., & Weder, B. (2001). Firm Size and The Business Environment: Worldwide Survey Results. *International Finance Corporation: Discussion Paper 43.*

Schultz, T. (1975). The Value of the Ability to Deal with Disequilibria. *Journal of Economic Literature*, *13*(3), 827–846. http://doi.org/10.2307/2722032

Shonchoy, A., & Tsubota, K. (2016). Economic Impact of Political Protests (Strikes) on Manufacturing Firms: Evidence from Bangladesh. *MPRA Paper No. 74146.*

Sönmez, S. F., & Graefe, A. R. (1998). Influence Of Terrorism Risk On Foreign Tourism Decisions. *Annals of Tourism Research*, *25*(1), 112–144. http://doi.org/10.1016/S0160-7383(97)00072-8

Staiger, D., & Stock, J. (1997). Instrumental Variables Regression with Weak Instruments. *Econometrica*, *65*(3), 557–586. http://doi.org/10.2307/2171753

Stel, N., & Naudé, W. (2016). "Public-Private Entanglement": Entrepreneurship Lebanon's Hybrid Political Order. *The Journal of Development Studies*, *52*(2), 254–268. http://doi.org/10.1080/00220388.2015.1081173

Tadjoeddin, M. Z. (2013). Anatomy of Social Violence in the Context of Transition: The Case of Indonesia, 1990-2001. *Politics Administration and Change*, *38*(July-December 2002), 1–35. http://doi.org/10.1017/CBO9781107415324.004

Tanter, R. (1966). Dimensions of Conflict Behavior Within and Between Nations, 1958-1960. *The Journal of Conflict Resolution*, *10*(1), 41–64.

Trentini, C., & Koparanova, M. (2013). Corruption and Entrepreneurship: Does Gender Matter? *UNECE Series of Discussion Papers No. 2013.1*, 1–38.

Urdal, H. (2006). A Clash of Generations? Youth Bulges and Political Violence. *International Studies Quarterly*, *50*, 607–629. http://doi.org/10.1111/j.1468-2478.2006.00416.x

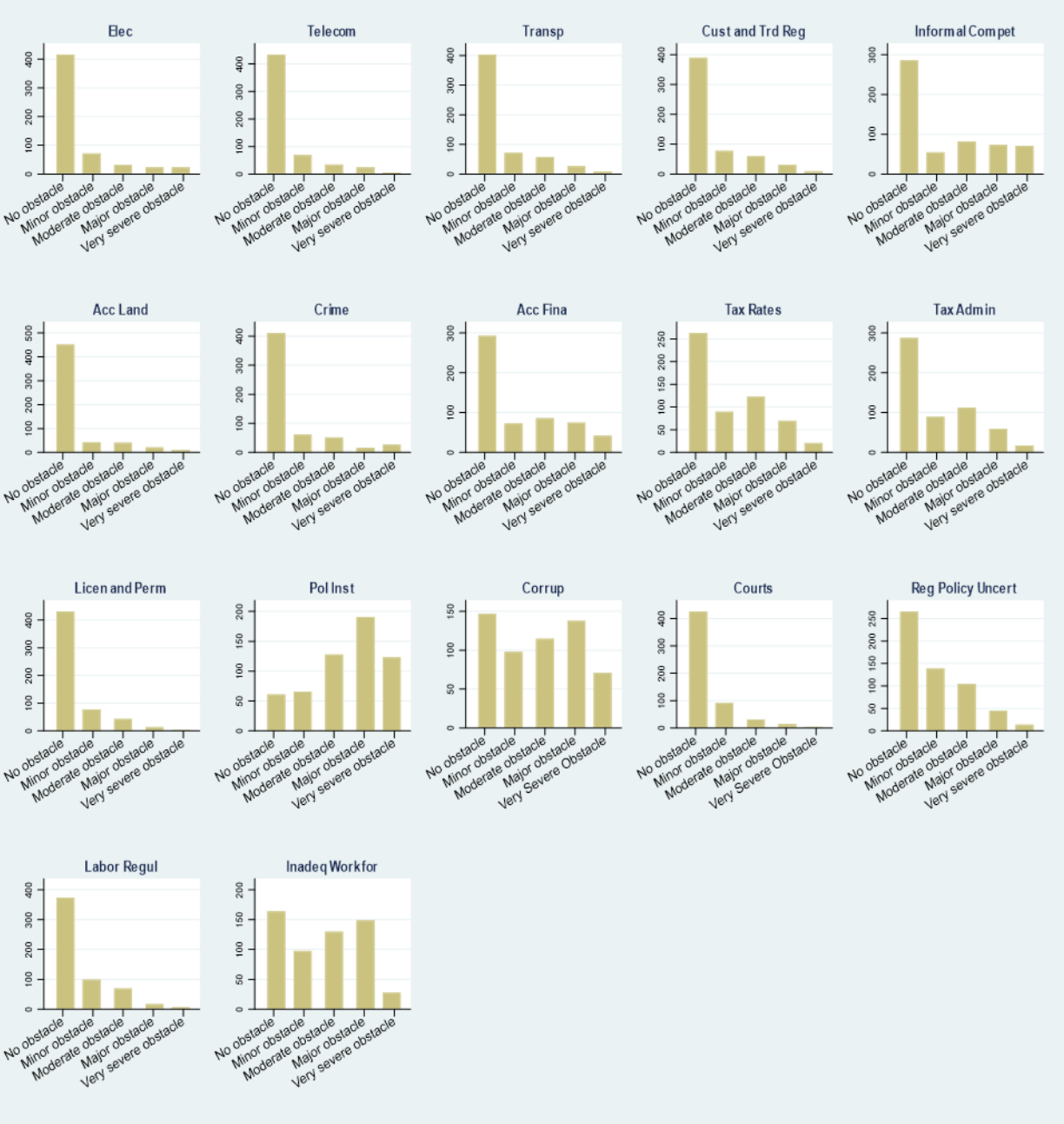
Vargas, J. P. M. (2015). *Identifying Binding Constraints to Growth: Does Firm Size Matter? IMF Working Paper 15/3.*

World Bank. (2004). *World Development Report 2005: A better investment climate for everyone.* Washington D.C.: Oxford University Press.

World Bank. (2015). *Tunisia: Systematic Country Diagnostic.* Washington D.C.

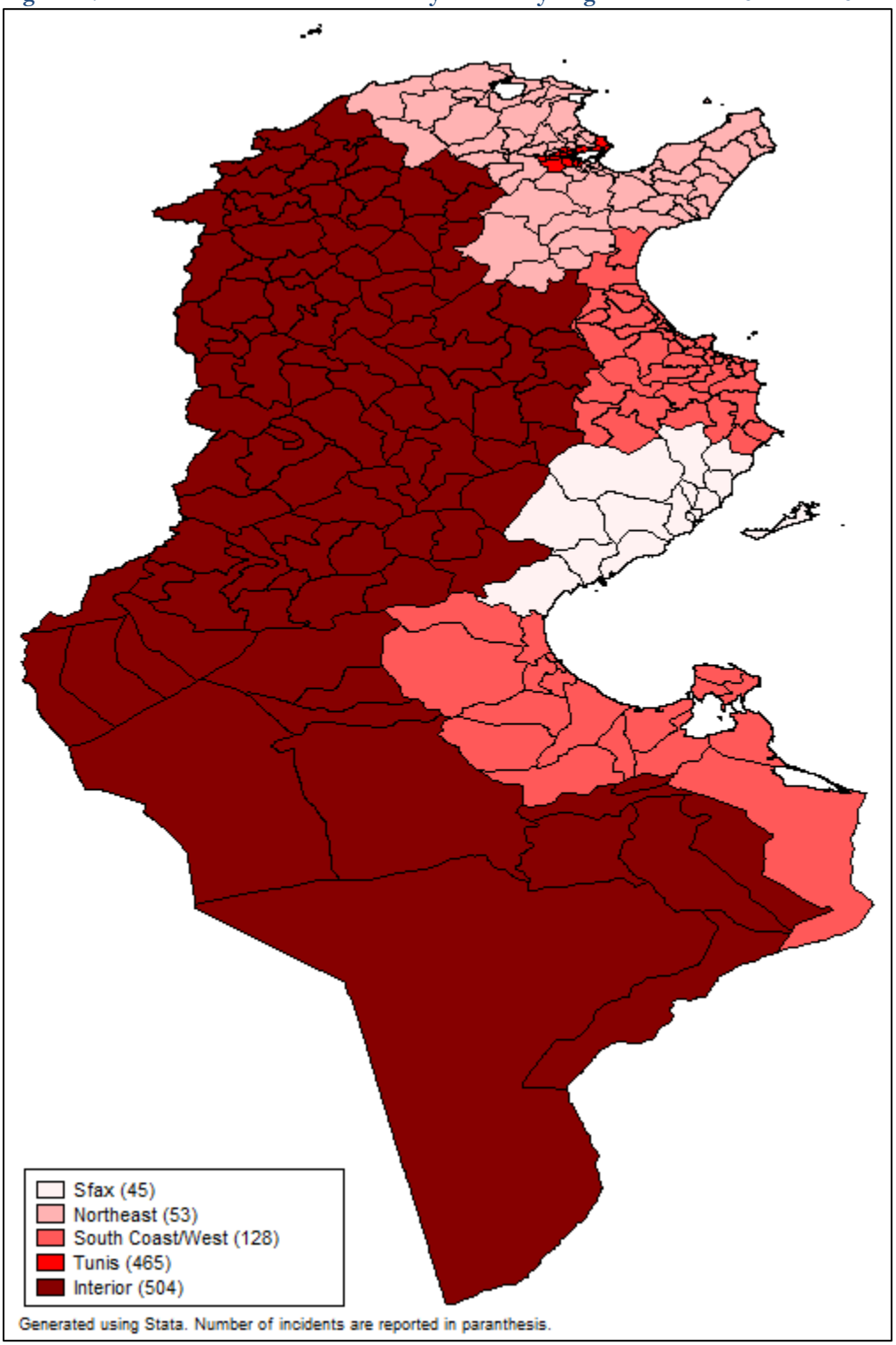
Appendix

Figure A.1: Frequency Distribution of Business Obstacles



Source: Author's calculation based on the TES data. Notes: The question used to gauge the perception of a firm manager towards a certain constraint is: "To what degree is constraint X an obstacle to the current operations of this establishment?". The answers to that question include a five-point scale ranging from "No Obstacle" coded as 0, to "Very Severe Obstacle" coded as 4. In each graph the number of observations is 569.

Figure A.2: Number of Political Instability Events by Region Between 2011 and 2014



Source: Author's own calculations based on the ACLED database.

Table A.1: List of firm characteristics and the corresponding coding

Variable	Category	Code
Firm Size	Small: 5 to 19 employees	1
	Medium: 20 to 99 employees	2
	Large: more than 100 employees	3
Firm Age	Number of years in operation since firm creation	Continious variable
Export Activity	Less than 10 percent of sales are direct exports	0
	More than 10 percent of sales are direct exports	1
Foreign Owned	Less than 50 percent of the company is owned by a foreign entity	0
	At least 50 percent of the company is owned by a foreign entity	1
Manager's Experience	Manager's years of eperience	Continious variable
Manager's Gender	Female	1
	Male	2
Manager's Education Level	Completed Primary school	1
	Preparatory or Incomplete Secondary school	2
	Completed Secondary school including Vocational	3
	University degree or higher	4
Subsidy	This establishment did not receive any subsidies	0
	This establishment received any subsidies	1

Source: TES database and author's own coding.

Table A.2: Summary statistics of firm characteristics

Variable	Obs	Mean	Std. Dev.	Min	Max
Size	569	1.87	0.76	1	3
Manag Exp	561	25.75	11.41	1	63
Manag Gend	569	1.93	0.26	1	2
Subsidy	566	0.16	0.37	0	1
Foreign	569	0.10	0.30	0	1
Age	567	22.81	14.12	1	108
Manag Educ	567	3.67	0.58	1	4
Exporter	569	0.39	0.49	0	1
Sales Growth	535	0.26	38.49	-66	164

Source: TES database and author's own coding.

Table A.3: Business Environment Obstacles Averaged Across Firm Characteristic

	Total Sample	Size[a]			Age[b]				Exporting Activity[c]		Manager's Experience[d]			
		Small	Medium	Large	Very Young	Young	Old	Very Old	Non-Exporter	Exporter	Little	Medium	High	A lot
Acc Fina	1.12	1.38	1.04	0.85	1.72	1.11	1.09	1.00	1.08	1.18	1.31	1.24	1.10	0.98
Acc Land	0.41	0.48	0.37	0.40	0.59	0.47	0.31	0.40	0.35	0.52	0.56	0.48	0.40	0.33
Licen and Perm	0.38	0.36	0.40	0.40	0.72	0.31	0.42	0.35	0.41	0.35	0.50	0.36	0.38	0.42
Corrup	1.80	1.92	1.80	1.62	1.72	1.84	1.88	1.50	1.77	1.86	2.50	1.93	1.81	1.49
Courts	0.38	0.41	0.38	0.33	0.53	0.43	0.26	0.41	0.41	0.34	0.75	0.44	0.34	0.34
Crime	0.57	0.64	0.56	0.48	0.66	0.54	0.56	0.66	0.54	0.62	0.81	0.55	0.52	0.70
Cust and Trd Reg	0.58	0.53	0.65	0.54	1.13	0.57	0.64	0.38	0.53	0.67	0.63	0.72	0.58	0.35
Inadeq Workfor	1.61	1.50	1.65	1.72	1.50	1.62	1.67	1.57	1.60	1.62	2.06	1.69	1.73	1.19
Labor Regul	0.57	0.49	0.65	0.53	0.69	0.57	0.51	0.63	0.53	0.62	1.06	0.49	0.61	0.52
Pol Inst	2.44	2.66	2.34	2.25	2.34	2.50	2.47	2.21	2.41	2.48	2.75	2.63	2.36	2.22
Reg Policy Uncert	0.95	0.95	1.06	0.75	1.06	0.96	0.87	1.00	0.90	1.02	1.00	0.93	0.93	1.00
Informal Compet	1.28	1.52	1.32	0.80	0.94	1.18	1.30	1.57	1.41	1.08	0.69	1.23	1.27	1.45
Tax Admin	1.00	1.09	0.99	0.87	1.16	0.95	1.03	1.08	1.03	0.96	0.69	1.02	0.98	1.09
Tax Rates	1.11	1.16	1.13	1.00	1.26	1.09	1.07	1.26	1.15	1.05	1.27	1.16	1.05	1.15
Elec	0.54	0.54	0.52	0.57	0.78	0.50	0.57	0.51	0.44	0.69	0.69	0.63	0.49	0.48
Telecom	0.41	0.43	0.37	0.43	0.56	0.40	0.46	0.33	0.36	0.48	0.69	0.48	0.33	0.38
Transp	0.54	0.57	0.51	0.54	0.66	0.51	0.58	0.54	0.53	0.54	0.88	0.58	0.51	0.49
Observations	569	205	235	129	32	255	171	92	346	223	16	196	233	116

Source: Author's calculation based on the TES data. Notes: [a]A firm is considered *Small* if it employs 5 to 19 employees, *Medium* if it employs 20 to 99 employees and *Large* if it employs at least 100 employees. [b]A firm is considered *Very Young* if it has been established 0 to 5 years prior to 2013, *Young* if it has been established 6 to 20 years prior to 2013, *Old* if it has been established 21 to 35 years prior to 2013 and *Very Old* if it has been established more than 36 years prior to 2013. [c]A firm is considered a *Non-Exporter* if it exports less than 10 percent of its sales and an *Exporter* if it exports more than 10 percent of its sales. [d]A firm manager is classified as having *Little* experience if he has 0 to 5 years of work experience, *Medium* experience if he/she has 6 to 20 years of work experience, *High* experience if he/she has 21 to 35 years of work experience and *A lot* of experience if he/she has more than 36 years of work experience.

Table A.3: (Continued) Business Environment Obstacles Averaged Across Firm Characteristic

	Manager's Gender		Manager's Education				Region					Sector		
	Female	Male	Prim School	Prep School	Second School	Univ or Higher	Tunis	Sfax	Northeast	Coast/ West	Interior	Manuf	Retail	Services
Acc Fina	1.67	1.08	1.40	1.22	1.07	1.13	0.91	1.12	1.23	1.02	1.73	1.07	1.25	1.17
Acc Land	0.45	0.41	0.00	0.78	0.37	0.42	0.30	0.34	0.46	0.46	0.63	0.49	0.28	0.33
Licen and Perm	0.52	0.37	0.80	0.39	0.36	0.38	0.37	0.60	0.32	0.29	0.35	0.38	0.44	0.37
Corrup	2.14	1.78	2.40	1.67	1.76	1.81	1.66	1.82	1.77	1.84	2.15	1.69	2.28	1.83
Courts	0.38	0.38	0.20	0.56	0.33	0.39	0.51	0.32	0.36	0.30	0.53	0.38	0.52	0.34
Crime	0.93	0.54	1.40	0.50	0.52	0.58	0.46	0.55	0.56	0.54	1.13	0.54	0.74	0.57
Cust and Trd Reg	0.69	0.57	0.60	0.22	0.45	0.64	0.85	0.55	0.74	0.24	0.50	0.54	0.62	0.63
Inadeq Workfor	1.93	1.59	2.20	1.33	1.43	1.68	1.45	1.31	1.71	1.76	2.08	1.69	1.66	1.47
Labor Regul	0.74	0.55	0.20	0.83	0.44	0.60	0.48	0.75	0.58	0.41	0.72	0.61	0.62	0.47
Pol Inst	2.69	2.42	2.00	2.22	2.46	2.45	2.31	2.31	2.48	2.45	3.00	2.28	2.59	2.65
Reg Policy Uncert	0.98	0.95	1.40	1.17	0.90	0.95	0.82	1.47	0.80	0.71	1.18	0.97	1.05	0.88
Informal Compet	1.33	1.27	2.00	1.28	1.58	1.17	1.08	1.66	1.24	1.20	1.13	1.21	1.70	1.26
Tax Admin	1.38	0.97	1.60	0.72	1.04	0.99	0.94	1.07	1.01	0.91	1.23	0.92	1.23	1.06
Tax Rates	1.39	1.09	1.60	0.44	1.29	1.08	1.05	1.20	1.10	1.04	1.33	1.01	1.23	1.24
Elec	0.81	0.52	1.00	0.72	0.34	0.59	0.50	0.29	0.80	0.49	0.63	0.61	0.44	0.44
Telecom	0.83	0.37	1.20	0.06	0.22	0.47	0.39	0.36	0.60	0.26	0.40	0.43	0.41	0.37
Transp	0.90	0.51	1.20	0.50	0.43	0.56	0.52	0.54	0.60	0.41	0.78	0.53	0.46	0.56
Observations	42	527	5	18	134	410	119	121	149	140	40	318	61	190

Source: Author's calculation based on the TES data.

Table A.4: Definition of the Objective Variables Corresponding to the Subjective Measures

Subjective Measure	Objective Variable	Definition of the Objective Measure
Access to Finance	Why the firm did not apply for a loan? (1: no need for a loan / 2: financing constraints)	Referring again to the last fiscal year 2012, what was the main reason why this establishment did not apply for any line of credit or loan? (i) No need for a loan -establishment had sufficient capital; (ii) Application procedures were complex; (iii) Interest rates were not favorable; (iv) Collateral requirements were too high; (v) Size of loan and maturity were insufficient; Did not think it would be approved or (vi) other.
Access to Land	Percentage of Land not owned by firm (%)	Of the land occupied by this establishment, what percent is not owned by this establishment (i.e. Rented, leased or other)
Corruption	Informal payment to public officials (% of sales)	On average, what percentage of total annual sales, or estimated total annual value, do establishments like this one pay in informal payments or gifts to public officials for this purpose?
Crime	Losses as a result of crime in 2012 (% of sales)	In fiscal year 2012, what were the estimated losses as a result of theft, robbery, vandalism or arson that occurred on this establishment's premises either as a percentage of total annual sales losses?
Customs and Trade Regulation	Number of days to obtain an import license	Approximately how many days did it take to obtain this import license from the day of the application to the day it was granted?
Inadequately Educated Workforce	Did this establishment have formal training programs for his employees in 2012? (yes/no)	Over fiscal year 2012, did this establishment have formal training programs for its permanent, full-time employees?
Practices of Competitors in the Informal Sector	Does this establishment compete against unregistered or informal firms? (yes/no)	Does this establishment compete against unregistered or informal firms?
Electricity	Number of power outages in a typical month	In a typical month, over fiscal year 2012, how many power outages did this establishment experience?
Telecommunications	Does the firm use of cell phones? (yes/no)	Does this establishment currently use cell phones for the operations of the establishment?

Source: TES database.

Table A.5: General-to-Specific OLS regressions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Acc Fina	-4.449***	-4.441***	-4.386***	-4.058***	-3.701***	-3.642***	-3.549***	-3.485***	-3.467***	-3.416**	-3.415**	-3.422***	-3.475***	-3.586***
	(1.350)	(1.360)	(1.374)	(1.378)	(1.335)	(1.333)	(1.330)	(1.312)	(1.310)	(1.321)	(1.321)	(1.323)	(1.288)	(1.273)
Acc Land	-1.967	-1.817	-1.783	-1.410	-1.360	-1.055	-1.135	-1.174	-1.005	-0.807	-0.785	-0.798	-0.820	
	(2.018)	(2.023)	(2.017)	(2.014)	(2.045)	(2.032)	(2.051)	(2.055)	(2.034)	(2.014)	(2.016)	(2.009)	(2.007)	
Licen and Perm	-1.296	-0.720	-0.655	-0.769	0.086	0.319	0.323	0.340	0.425	0.899				
	(2.484)	(2.541)	(2.556)	(2.462)	(2.437)	(2.481)	(2.475)	(2.468)	(2.450)	(2.514)				
Corrup	1.454	2.159	2.418	2.406	2.342	2.276								
	(1.507)	(1.490)	(1.504)	(1.516)	(1.512)	(1.516)								
Courts	0.266	0.575	0.508	0.419	1.138	1.506	1.595	1.625						
	(2.539)	(2.585)	(2.563)	(2.548)	(2.580)	(2.530)	(2.526)	(2.519)						
Crime	0.443	0.057	0.249	0.312	0.674	0.980	1.124	1.239	1.391					
	(2.206)	(2.259)	(2.234)	(2.217)	(2.232)	(2.231)	(2.231)	(2.172)	(2.142)					
Cust and Trd Reg	5.901***													
	(1.896)													
Inadeq Workfor	-0.682	-0.399	-0.360	-0.246	0.101	0.107	0.866							
	(1.381)	(1.348)	(1.342)	(1.341)	(1.388)	(1.386)	(1.355)							
Labor Regul	3.584*	3.633	4.118*	4.184*										
	(2.173)	(2.251)	(2.213)	(2.210)										
Pol Inst	-6.177***	-6.635***	-6.582***	-6.107***	-6.048***	-5.865***	-4.686***	-4.508***	-4.473***	-4.295***	-4.248***	-4.261***	-4.297***	-4.317***
	(1.658)	(1.657)	(1.653)	(1.628)	(1.653)	(1.655)	(1.506)	(1.495)	(1.499)	(1.459)	(1.444)	(1.416)	(1.390)	(1.387)
Reg Policy Uncert	-3.059*	-2.553	-2.474	-2.116	-1.116	-1.070	-0.790	-0.956	-0.625	-0.251	-0.093			
	(1.822)	(1.835)	(1.826)	(1.793)	(1.744)	(1.754)	(1.768)	(1.719)	(1.649)	(1.588)	(1.542)			
Informal Compet	0.693	1.113	0.905	0.930	0.815	0.708	0.757	0.787	0.821					
	(1.239)	(1.235)	(1.232)	(1.243)	(1.214)	(1.223)	(1.222)	(1.216)	(1.217)					
Tax Admin	-4.362*	-4.478*	-4.698**	-1.084	-0.766	-0.937	-0.707	-0.637	-0.598	-0.428	-0.292	-0.307		
	(2.288)	(2.315)	(2.288)	(1.644)	(1.633)	(1.641)	(1.620)	(1.634)	(1.634)	(1.594)	(1.516)	(1.506)		
Tax Rates	4.561**	4.766**	5.062**											
	(2.293)	(2.297)	(2.270)											
Elec	-1.050	-0.484	0.149	0.277	2.074									
	(1.678)	(1.686)	(1.711)	(1.729)	(1.473)									
Telecom	3.470	3.804	4.468*	4.039										
	(2.583)	(2.659)	(2.509)	(2.548)										
Transp	2.233	3.429												
	(2.020)	(2.096)												
Additional Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	518	518	518	519	519	519	519	519	519	520	520	520	520	520

Notes: Robust standard errors in parentheses. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively. The dependent variable is the real firm sales growth rate between 2009 and 2012. In all regressions, the set of firm characteristics includes: the firm age (and age squared), its export activity, its legal status, whether its foreign owned, the percentage of the firm owned by the government, and the manager's years of experience, his/her education level and gender.

Table A.6: First-Stage IV Results

	Panel A		Panel B	
	(1)	(2)	(3)	(4)
	Access to Finance	Political Instability	Access to Finance	Political Instability
Access to Finance (Average)	0.968***		0.963***	
	(0.079)		(0.104)	
Political Instability (Average)		1.014***		1.001***
		(0.076)		(0.077)
Access to Finance Objective Measure (Average)			0.054	
			(0.214)	
Losses as a result of crime in 2012 (% of sales)				0.040***
				(0.010)
Additional Controls	Yes	Yes	Yes	Yes
Observations	520	520	499	519

Notes: Robust standard errors in parentheses. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively. In each regression, the dependent variable is presented below the column number. In all regressions, the set of firm characteristics includes: the firm age (and age squared), its export activity, its legal status, whether it is foreign owned, the percentage of the firm owned by the government, and the manager's years of experience, his/her education level and gender. In panel A (B), we consider the first stage regressions of column 4 (5) of Table 2.

.

Table A.7: Impact of Obstacles on Employment Growth

	OLS			IV	
	(1)	(2)	(3)	(4)	(5)
Acc Fina	0.250				
	(1.296)				
Acc Land	0.123				
	(2.216)				
Licen and Perm	0.320	-0.125			
	(2.327)	(2.343)			
Corrup	1.381				
	(1.701)				
Courts	-0.214	0.316			
	(2.332)	(2.240)			
Crime	-0.179	-0.580			
	(1.680)	(1.693)			
Cust and Trd Reg	1.656				
	(1.526)				
Inadeq Workfor	-2.917**	-2.104*	-2.129*	0.891	0.787
	(1.420)	(1.267)	(1.225)	(2.697)	(2.666)
Labor Regul	-0.793	-0.480			
	(2.042)	(2.012)			
Pol Inst	-5.805***	-4.591***	-4.530***	-10.067***	-9.915***
	(1.744)	(1.424)	(1.322)	(2.601)	(2.600)
Reg Policy Uncert	-0.416	-0.017			
	(1.815)	(1.801)			
Informal Compet	-0.415	0.111			
	(1.175)	(1.198)			
Tax Admin	-1.614	-0.127			
	(1.820)	(1.384)			
Tax Rates	1.610				
	(1.816)				
Elec	-1.432	0.721			
	(1.817)	(1.915)			
Telecom	3.229*				
	(1.875)				
Transp	-0.379	0.509			
	(1.537)	(1.554)			
Additional Controls	Yes	Yes	Yes	Yes	Yes
Observations	511	513	514	514	513
F-test (Inadequately Educated Workforce regression)				94.9	61.5
F-test (Political Instability regression)				74.9	49.7
Overidentifcation test (p-value)					0.87

Notes: Robust standard errors in parentheses. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively. The dependent variable is the growth rate of full-time employees between 2009 and 2012. In all regressions, the set of firm characteristics includes: the firm age (and age squared), its export activity, its legal status, whether it is foreign owned, the percentage of the firm owned by the government, and the manager's years of experience, his/her education level and gender. The endogenous variables are the political instability and the inadequately educated workforce. In column 4, the region-sector-size average of each endogenous variable is used as a respective instrument. In column 5, we add the percentage of annual sales resulting from crime events (vandalism, arson, etc.) as an instrument.

Table A.8: Disaggregated Impact of Damaging Constraints on Sales Growth

	OLS	IV
	(1)	(2)
Acc Fin (Small Obstacle)	-7.393	-9.092
	(4.899)	(12.058)
Acc Fin (Big Obstacle)	-10.666***	-24.150***
	(3.600)	(8.180)
Pol Inst (Small Obstacle)	-4.991	-14.251
	(7.100)	(17.659)
Pol Inst (Big Obstacle)	-16.858***	-34.055***
	(5.168)	(11.670)
Additional Controls	Yes	Yes
Observations	520	519
F-test (in Small Access to Finance)		13.1
F-test (in Big Access to Finance)		34.3
F-test (in Small Political Instability)		11.2
F-test (in Big Political Instability)		29.5
Overidentifcation test (p-value)		0.85

Notes: Robust standard errors in parentheses. *, **, *** indicate significance levels of 10%, 5%, and 1%, respectively. The dependent variable is the real firm sales growth rate between 2009 and 2012. In all regressions, the set of firm characteristics includes: the firm age (and age squared), its export activity, its legal status, whether it is foreign owned, the percentage of the firm owned by the government, and the manager's years of experience, his/her education level and gender. Small obstacle equals 1 if firm i considers issue X a minor constraint and Big Obstacle equals 1 if firm i considers issue X as moderate, major or very severe constraint.

Supplemental Appendix

"The Microeconomic Impact of Political Instability: Firm-Level Evidence from Tunisia"

Samer Matta*

* PhD student in Economics at the University of Nottingham; e-mail: samer.matta@nottingham.ac.uk.

This Supplemental Appendix (SA) includes three sections. The first describes the ACLED database referred to in the main text, while the second examines the relationship between subjective and objective business constraints measures mentioned in section 2 of the main text. Finally, the third section explores whether our dataset suffers from a survivor bias.

SA.1. The ACLED Database

ACLED is a conflict dataset that was recently launched by Raleigh et al. (2010) to provide disaggregated data about conflicts in more than 60 countries located particularly in Africa and Asia. In its fifth and latest version,[37] the ACLED database reports different kind of conflict events, based on articles and reports from the humanitarian agencies, the media, and other research publications. It contains detailed information regarding the date and location (including detailed GPS coordinates such as longitude and latitude) of each conflict event. In addition, it includes the number of fatalities that resulted from each event as well as the parties involved in it. Most importantly, this database includes five different kinds of conflicts in the Tunisian case, which according to Raleigh and Dowd (2015) are defined as following:

- Battle won by defender: "A battle between two violent armed groups where control of the contested location does not change".
- Non-violent activity: "This category is designed to capture events that are important within a state's political history, and may be triggers of future events, but are not directly violent"
- Remote violence: "Remote violence refers to events in which the tool for engaging in conflict did not require the physical presence of the perpetrator."
- Violence against civilians: "Violence against civilians occurs when any armed/violent group attacks civilians".
- Protests/Riots: "A protest describes a non-violent, group public demonstration, often against a government institution. Rioting is a violent form of demonstration".

[37] Version 5 of the ACLED database includes conflict data from 1997 till 2014.

SA.2. Relationship Between Subjective and Objective Measures

One possible drawback of our analysis is the use of subjective data (managers' perception towards a certain issue as a constraint) as measures of business environment constraints. According to Bertrand and Mullatinathan (2001), subjective measures used typically in surveys may be affected by general waves of optimism or pessimism which may induce a measurement error of the true impact of a certain obstacle to firm growth. However, several studies found evidence of a significantly positive relationship between different perception based measures and their objective variables (Contessi and De Nicola, 2013; Hallward-Driemeier and Aterido, 2009; Pierre and Scarpetta, 2004). To test whether these associations hold in our data, we follow Hallward-Driemeier and Aterido (2009) and estimate the following Ordered Probit model for each subjective measure for which an objective counterpart is available in the TES database:

$$Subjective\ Const_i = \alpha + \beta_1 \times Objective\ Const_i + \delta_d + \varepsilon_i. \quad \text{(S.1)}$$

In equation (S.1) $Subjective\ Const_i$ is the categorical variables that ranges from 0 (no obstacle) to 4 (very severe obstacle) representing firm i's perception towards a certain issue as a business environment obstacle (as defined earlier), while $Objective\ Const_i$ is an objective measure of the corresponding constraint selected based on previous research (Hallward-Driemeier and Aterido, 2009; Krauss, 2015). Table A.4 lists the objective variables corresponding to each subjective measure in addition to a definition of the former. Finally, δ_d is an industry dummy variable which captures the fact that firms in different industries may be more impacted by certain obstacles (e.g. firms in labor intensive sectors may be more impacted by labor regulations than firms that rely more on capital).

As reported in Table SA.1, out of the nine perception based constraints that have a corresponding objective measure in the TES,[38] eight have a positive and statistically significant β_1 meaning that as the real business environment worsens, the probability that a firm perceives this constraint as more damaging to its growth increases.[39] Therefore, the variation in the subjective measures of business constraints used in the TES captures, albeit not perfectly, the actual impact of these constraints on firms. Before proceeding, we should note that the insignificance of the estimated coefficient for the customs and trade regulation, may be due to the fact the objective variable (number of days to obtain an import license) is not a good measure of

[38] For the following eight subjective measures of business environment constraints, the TES database did not have objective measures: Courts, Labor regulations, Political Instability, Regulatory Policy Uncertainty, Tax administration, Tax rate, Transport. Meanwhile, for Business licensing and permits, there was only 20 enterprises that applied to obtain an operating license.

[39] Given our interest in the relationship between subjective and objective measures of business environment constraints, it suffices to look at the sign and significance of the β_1's without looking at the marginal effects which determine the reaction of the subjective measure ($Subjective\ Const_i$) to a one unit increase in its objective counterpart ($Objective\ Const_i$).

the trade environment given that around 20 percent of firms have reported customs and trade regulation as an obstacle to their functioning while not even applying to obtain an import license.

SA.3. Potential Survivor Bias

As mentioned in section 2 of the main text, our results might suffer from a firm survivor bias. Unfortunately, it is not possible to address this potential survivor bias as the TES data does not cover the pre-revolution period.

However, aggregated level data from the Répertoire National des Entreprises (RNE) published by the Tunisian National Institute (TNI) can be used to shed light on the firm exit rate dynamics across different regions and size classifications. In particular, substantial differences in firm exit changes after 2011 would signal that the revolution had a substantial differential impact on firm exit across different categories; thereby increasing the likelihood of a possible survivor bias in the TES. As illustrated in Figure SA.1 and Figure SA.2, the change in firm exit rate[40] followed, since 2011, a similar path across different size classifications and regions, respectively, indicating that the increase in firm exit in 2011 was random and not particular to a certain group of firms. Therefore, we conclude that there is no (observable) evidence supporting any firm survivor bias.

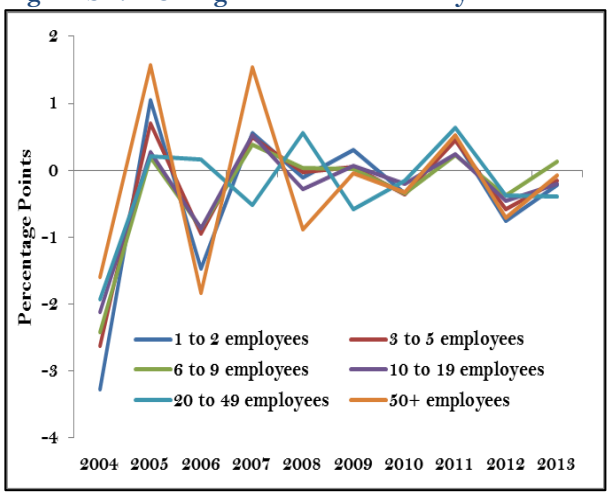
[40] We define firm exit rate as the number of firms that exited the market in year t divided by the total number of firms in the market at the end of year t-1 multiplied by 100.

Table SA.1: Ordered Probit models of subjective measures regressed on their objective counterparts

Dependant Variable →	Access to finance	Access to land	Corruption	Crime	Customs and trade regulation	Inadequately educated workforce	Practices of competitors in the informal sector	Electricity	Telecommunications
Why the firm did not apply for a loan? (1: no need for a loan / 2: financing constraints)	1.417***								
	(0.144)								
Percentage of Land not owned by firm (%)		0.002*							
		(0.001)							
Informal payment to public officials (% of sales)			0.039***						
			(0.006)						
Losses as a result of crime in 2012 (% of sales)				0.179***					
				(0.054)					
Number of days to obtain an import license					0.007				
					(0.005)				
Did this establishment have formal training programs for his employees in 2012?						0.169*			
						(0.097)			
Does this establishment compete against unregistered or informal firms? (yes/no)							2.212***		
							(0.129)		
Number of power outages in a typical month								0.144***	
								(0.045)	
Does the firm use of cell phones? (yes/no)									0.660***
									(0.221)
Observations	321	569	397	567	134	569	565	565	569
Sector Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

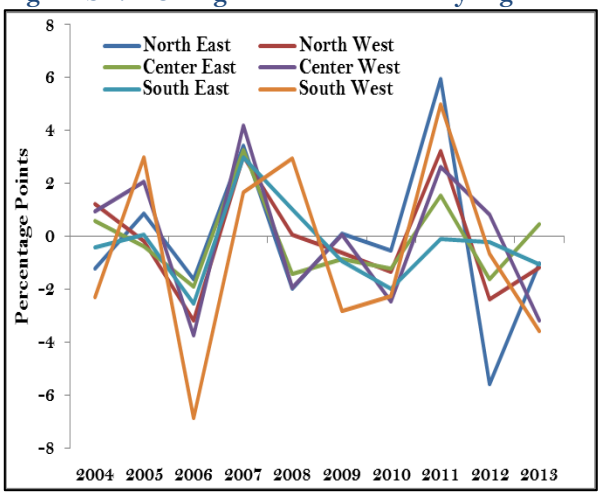
Source: Author's own calculations based on the TES database. Notes: In each individual regression, the dependent variable is a categorical variables that ranges from 0 (no obstacle) to 4 (very severe obstacle) representing firm i's perception towards a certain issue as a business environment obstacle. Robust standard errors in parentheses and *, **, *** indicate statistical significance at the 10%, 5% and 1% level, respectively.

Figure SA.1: Change in firm exit rate by firm size



Source: RNE database and author's own calculations.

Figure SA.2: Change in firm exit rate by region



Source: RNE database and author's own calculations.