

# FDI response to political shocks: What can the Arab Spring tell us?

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## Abstract

This paper examines the FDI response to political shocks. We first investigate whether political or institutional quality is an important determinant of FDI inflows using a panel VAR model in a dataset of 146 countries over the period of 1989-2015. Then, we exploit the Arab Spring incidence to measure the short-run effects of political shocks on FDI flows using the differences-in-differences (DiD) estimator for a sub-sample of nineteen countries in the MENA region. We account for possible bias of the DiD estimator resulting from dealing with heterogeneous group of countries by using the propensity score matching based on the countries economic development and political settings. Our findings show that a positive shock to political quality would increase FDI flows which lends evidence to the importance of political quality as an important determinant of FDI flows. In addition, we find that the Arab spring has led to a drop in FDI flows to the MENA region.

*Keywords:* Political Shocks, FDI, MENA Region, Arab Spring, Panel VAR

*JEL code:* F21, D72, O47, C33

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## 1. Introduction

Foreign direct investment (FDI) can be an important growth vehicle.<sup>1</sup> Economic theory and empirical evidence explain this link via a number of transmission channels such as know-how, propensity-to-export, human capital, and employment.<sup>2</sup> Policy makers,

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<sup>1</sup>See, for example, Zhang (2001); Hansen and Rand (2006); Ayanwale (2007); Gursoy et al. (2013); Castro (2014)

<sup>2</sup>See Mankiw et al. (1992); Basu and Weil (1998); Borensztein et al. (1998); Galor and Weil (2000); Blomström and Kokko (2002); Liu et al. (2002); Blomström and Kokko (2003); Javorcik (2004); Castro (2014); Goswami and Haider (2014)

especially in developing countries, put measures in place to ensure a favourable investment climate for foreign investors. While many countries were successful in attracting considerable amounts of FDI, others failed to secure but modest levels of these flows. Such observation has triggered empirical research on the determinates of FDI flows. However, focusing primarily on economic factors, this research has paid relatively less attention to political determinants of FDI. In fact, FDI might be even more sensitive to political factors compared to economic ones; given that FDI mobility is an *ex ante* by nature and illiquid *ex post*. That is, political risk appears to be a relevant determinant for foreign investors<sup>3</sup>.

Unsurprisingly, studies on political determinants of FDI has flourished recently; given the unstable political arena in many countries around the world, especially in the MENA region. To reign in foreign investment, perhaps offering financial and fiscal incentives may not be sufficient. Political stability is a crucial factor in play for investors to ensure the sustainability of these incentives in order to seize their advantages. Politically unstable countries with poor institutional settings are more likely to fail in attracting FDI flows. This lends importance to research examining how the quality and stability of political institutions in host countries would affect investors' perception of risk levels they will have to take on. Current studies examining the FDI-politics nexus focus on long-run relationships, which overlooks the impact of sudden political shocks on the FDI allocation behaviour. In this regard, the '*Arab Spring*' has put forward such a question on the research agenda for the coming years, which motivates our study. We first investigate the relationship between FDI flows and political quality. Then, we exploit the incidence of the Arab Spring to study how sudden political shocks may affect the FDI geographical distribution, focusing on the short run effects of the Arab Spring on FDI flows to the MENA region.

This is the first paper to study the effects of the Arab Spring on FDI flows. Thus, it contributes to the body of literature that focuses on the political determinants of FDI. It is extremely important for policy makers to understand how FDI flows may respond to a political shock in a given country and/or region. Therefore, our findings are of direct interest to policy makers who wish to evaluate the effects of sudden political shocks in distorting FDI flows.

This paper proceeds as follows. Section 2 overviews the FDI flows and its relationship with host countries political and economics characteristics, especially in the MENA region. Section 3 reviews the existing literature. Section 4 explains our methodology. Section 5 summarises the dataset and variables of interest. Section 6 presents the empirical results. Finally, section 7 concludes.

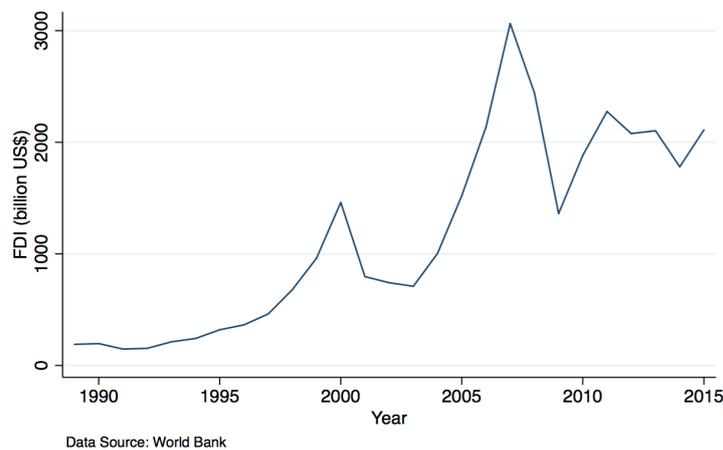
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<sup>3</sup>Although FDI is a more stable carrier of investment and less footloose when compared to other sources of finance, empirical studies and experience have proven that international investors are quite sensitive to political risks.

## 2. Background

Considering the FDI flows worldwide, it has witnessed a tremendous increase in 2000s; compared to 1980s and 1990s. Fig. 1 shows the evolution of FDI flows worldwide between 1989-2015. Although there is an obvious upward trend from the beginning of the 1990s, the figure shows that FDI flows have shown a distinctive increasing trend in the 2000s. More particularly, the average FDI flows rose from about \$296 billion between 1989-1999 to about \$1.2 trillion between 2000-2007. However, with the eruption of the 2007-2008 global financial crisis the FDI flows have dropped sharply. Two years after the crisis, the FDI shows signs of recovery though never reached its before crisis peak. Yet, the FDI flows remain above their 1990s level.

Figure 1: FDI flows (1989-2015), World

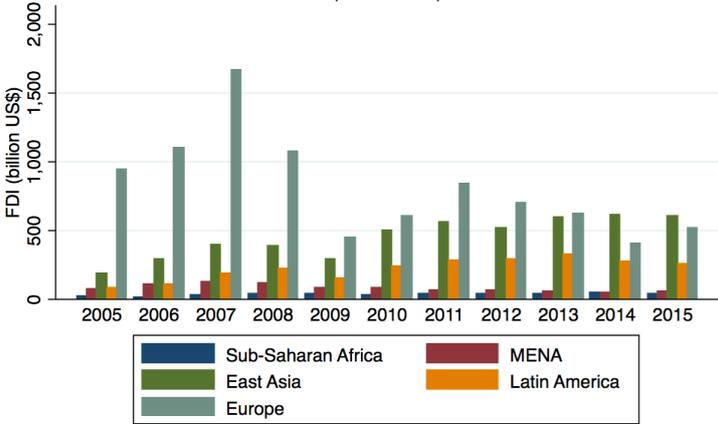


Looking at the regional distribution of the FDI flows, one can easily notice that Europe has secured the lion's share amongst the world's regions, over the precedent decade. Fig. 2, which plots FDI flows between 2005-2015 by region, shows that Sub-Saharan Africa and MENA regions have always received a modest share of the FDI cake. More specifically, while Europe has received, on average, \$0.8 trillion Sub-Saharan African and MENA countries only received \$33 billion and \$83 billion, respectively. The same figures were \$215 billion & \$433 billion in Latin America and East Asia. Nevertheless, as noted earlier, the global financial crisis of 2007-2008 seems to have negative impacts on FDI flows in almost all regions, see Fig. 2. However, it is evident how uneven the regional distribution of FDI is among different parts in the world economy. That is, the MENA region seems to be running far behind in terms of attracting FDI flows. Thus, it is important for policy makers in Sub-Saharan Africa and MENA countries to understand what determines the FDI inflows.

Our study focuses on how FDI responds to sudden political shocks in the MENA region. What makes the MENA region a very interesting context for our study is the eruption of the Arab Spring; a series of political shocks that might have knocked foreign investors' confidence in the region. Although the MENA region seems to have benefited from the

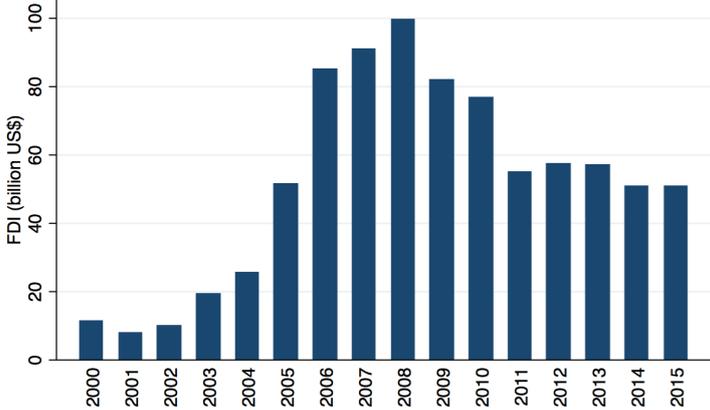
surge in the world FDI flows, its share compared to other regions remains modest, Fig. 3. In addition, like other regions, the MENA countries were not immune to the negative effects of the global financial crisis on FDI flows. In Fig 3, which shows the evolution of FDI flows to the MENA region between 2000 and 2015, although FDI showed some signs of recovery after the global crisis in other regions, it witnessed another drop in the MENA region from 2011 and onward, i.e., coincidence with the Arab Spring event.

Figure 2: FDI flows (2005-2015), by region



Data Source: World Bank

Figure 3: FDI flows (2005-2015), MENA region



Data Source: World Bank

Since we focus primarily on the MENA region, Fig. 4 and Fig. 5 plot the average FDI flows in the region between 2005-2015 against individual countries specific institutional settings and economic development characteristics. For this purpose, we use the *polty* index to proxy for country specific institutional quality and GDP growth rate to represent

economic development process in the host country<sup>4</sup>. As can be seen in Fig. 4, although Lebanon and Israel have the highest values for the *polty* index, yet they attract different amounts of FDI flows, measured as a percentage of GDP. Nonetheless, both figures, 4 and 5, suggest that both institutional quality and economic development might be of important determinants of the FDI flows into MENA countries.

Figure 4: FDI & Polty (2005-2015), MENA countries

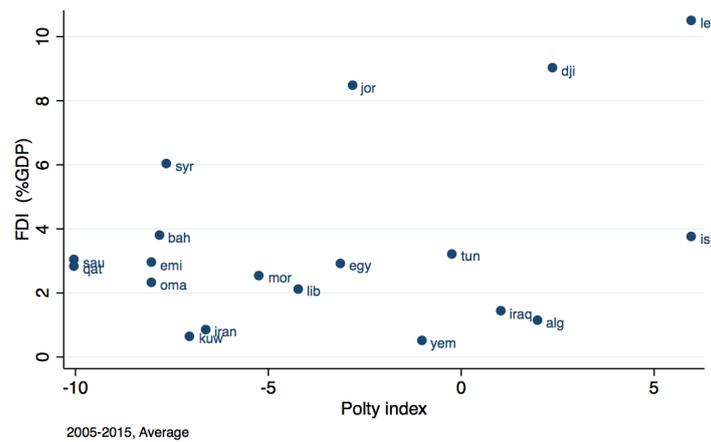
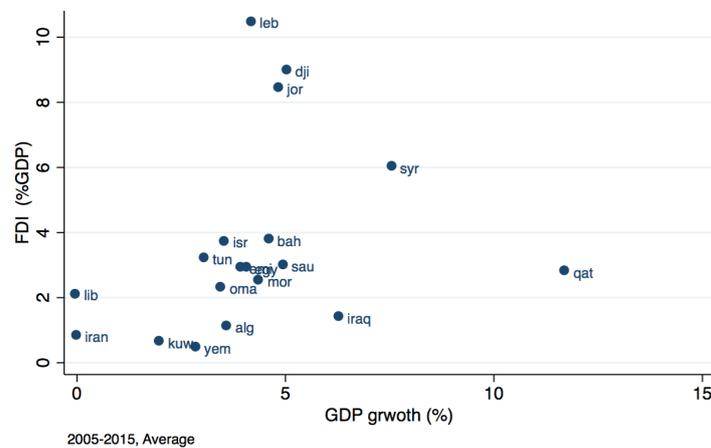


Figure 5: FDI flows & GDP growth (2005-2015), MENA countries



### 3. Literature Review

The uneven distribution of the FDI flows among different regions/countries stimulated empirical research studying what determines FDI. Numerous studies have primarily

<sup>4</sup>More details about the dataset can be found in section 5.

focused on the economic determinants of FDI. Such factors can be broadly classified into two groups: *pull factors* and *push factors*. The '*pull*' factors include host country-specific attributes such as market size, per capita growth, good infrastructure, and trade openness.<sup>5</sup> The '*push*' factors are related to the conditions in the source country (Mathur and Singh, 2013). However, the economic determinants of FDI flows have been extensively studied<sup>6</sup>. Only few studies lend importance to the effect of political factors on FDI inward flows. This body of literature has shown that FDI flows are more sensitive to political factors than they are to economic factors. This is justified on the ground that FDI mobility is an *ex ante* by nature and illiquid *ex post*, which implies the relevance of political risk for foreign investors. In fact, since the FDI decision represents a long-term investment decision, it follows that investors undertake a substantial amount of risk when choosing the host country (Borensztein et al., 1998).

In this context, overseas capital movements face different types of political risk such as the risk of expropriation. For example, the theoretical model proposed by Asiedu et al. (2009) shows that higher levels of expropriation risk would lead underinvestment and would attenuate the optimal level of FDI. Thus, any unexpected *government intervention* in the host country would be a typical example of political risk facing foreign investors when deciding on a destination for their investment (Madani and Nobakht, 2014).

Nevertheless, the existing literature identifies three scenarios when explaining the effects of political institutions and regime type on FDI. The first scenario implies that democratically elected regimes, in which institutions are fundamentally defined in favour of free markets, reduce political risks facing businesses. For example, Madani and Nobakht (2014) use a dynamic panel model of 31 upper middle income countries to find that democracy enhances FDI inflows. Similar results can be found in Harms and Ursprung (2002) who find that FDI tends to flow into countries with civil and political freedom. Busse (2003) uses a panel data model to conclude a clear causation between democratic rights and FDI per capita.

The second scenario in the literature asserts no link between democracy and FDI inflows. Goswami and Haider (2014) refute that government failure can explain poor FDI inflow. Similar results appear in Li (2009) and Schulz (2009), where they find no linkage between FDI and political regime. Utilising the democracy-dictatorship (0,1) dataset of Cheibub et al. (2010) and a dynamic panel data model, Castro (2014) find no evidence that relates FDI to democracy. In addition, Mathur and Singh (2013) show that economic freedom in the host country is what influences foreign investors' decisions regardless of its political freedom. The authors argue that more democratic countries with poor economic freedom may receive less FDI flows.

The third scenario points to a 'cosy' relationship between foreign investors and autocrats to the extent to conclude a negative impact of democracy on FDI flows. Their argument

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<sup>5</sup>See, Chen (1996); Lipsey (2000); Asiedu (2002); Durham (2004); Sekkat and Veganzones-Varoudakis (2007); De Vita and Kyaw (2008), among others.

<sup>6</sup>A non-exhaustive list includes Balasubramanyam et al. (1996); Moran (1998); Noorbakhsh et al. (2001); Moosa et al. (2002); Blonigen (2005); Helpman (2006).

rests on the freedom and the lack of accountability authoritarian rulers enjoy which entitle them to offer relatively more generous incentives to foreign investors (Alesina and Dollar, 2000). This scenario can be found in studies such as Haggard (1990); Busse (2004); Adam and Filippaios (2007) who actually state that FDI may benefit from dictatorships. Finally, Li and Resnick (2003) explains this argument further. The authors suggest that democratic institutions are more likely to adopt policies that reflect popular sentiment, which may not be in favour of foreign investors. Autocratic leaders, on the other hand, adopt biased policies that favour the narrow elite control which are more likely to favour foreign investors and facilitate collusion-based expansions in their market share.

In whichever case, research on the FDI impacts of political shocks is very scarce. For example, empirical evidence reported in Busse and Hefeker (2007) point to a number of political factors in the host country, such as the stability of the central government stability, that are important in determining the level of FDI flows. Similar examples include Dutta and Roy (2011) and Roe and Siegel (2007). The authors argue that politically unstable governments are more likely to adopt a more myopic attitude toward foreign investors. In addition, Stasavage (2002), study how political uncertainty can deter private investment across countries through the channel of risk perception. Finally, Janeba (2002) shows how poor levels of government ‘credibility’ in the host country can explain why developing countries seem not to be attractive destinations for foreign capital.

To sum up, scholars usually focus on exploring the long-run impact of a given set of macroeconomic and/or political factors on the behaviour of foreign investors, in terms of their country of preference. However, the results on the linkage between FDI inflows and the quality of political institutions and regime type have remained inconclusive. Meanwhile, very few studies looked at the short-run responses of FDI to sudden political turmoil, which motivates the current study to fill several loopholes that currently exist in the literature. More particularly, our study makes an attempt to answer two research questions, which not yet are adequately covered in the literature: i) how do FDI flows respond to political shocks?; ii) how did the *Arab Spring*, defined as sudden and successive political shocks to the MENA region, affect FDI inflows?

#### 4. Methodology

We first employ a *panel VAR* modelling approach to investigate the FDI response to political shocks. A simple VAR model in which all variables are endogenous and interdependent can be presented as follows. Let  $Y_t$  be a  $G \times 1$  vector of endogenous variables. Then, a VAR representation of  $Y_t$  can be presented as follows.

$$Y_t = \mathbf{A}_0(t) + \mathbf{A}(l)Y_{t-1} + u_t \quad (1)$$

where  $u_t \sim iid(0, \Sigma_u)$ . A panel VAR model can have the same structure above, however will encompass a cross sectional dimension in addition to its time representation. Suppose that  $Y_t = (y'_{1t}, y'_{2t}, \dots, y'_{Nt})'$ , it follows that the panel formation of Eq. 1 can be presented as follows.

$$Y_{it} = \mathbf{A}_0(t) + \mathbf{A}_1(l)Y_{t-1} + u_{it} \quad (2)$$

where  $i = 1, \dots, N$  &  $t = 1, \dots, T$  and  $u_{it} = G \times 1$  is a vector of random disturbances. In this study, we estimate a trivariate model that includes FDI inflows, a proxy for political settings and a measure of development process in the host country. After estimating the panel VAR model, as well as confirming its stability, we produce the impulse response functions in order to examine how FDI flows respond to political shocks in the whole sample.

In addition, to capture the possible effect of the Arab Spring on FDI flows through the institutional quality channel, we employ the Differences-in-Differences (DiD) estimation. The DiD strategy compares countries that are from the MENA region with those that are not. With this purpose, it is necessary to define a treatment group composed of countries in the MENA region which were subject to a political shock (i.e., the Arab Spring), and a control group formed by countries which were not subject to the shock (i.e., outside the MENA region). The DiD estimator will capture the differential effect of the shock on our treatment group relative to non-treatment countries. To apply the DiD estimator all that is necessary is to measure outcomes in the treatment and control groups both before and after the shock. The simple DiD estimator compares the mean of the outcome in treatment and control groups which is well justified on the grounds that they should not have any systematic differences in any other pre-treatment variable. Let  $\mu_{it}$  is the mean of the outcome in group  $i$  in time  $t$ , where  $i = 0$  if the country falls outside the MENA region (control group) and  $i = 1$  if the country belongs the the MENA region (treatment group). Define  $t = 0$  as a pre-treatment period ( $year < 2011$ ) and  $t = 1$  as post-treatment period ( $year \geq 2011$ ). Thus, a simple DiD estimator can be expressed as  $(\mu_{11} - \mu_{10}) - (\mu_{01} - \mu_{00})$ . The first term is the change in outcome for the treatment group and the second term is the change in outcome for the control group. A DiD regression based estimator can be obtained by estimating the following equation.

$$y_{it} = \beta_0 + \beta_1 MENA_i + \beta_2 S\text{pring}_t + \beta_3 MENA_i.S\text{pring}_t + \epsilon_{it} \quad (3)$$

Where  $y_{it}$  is the outcome of interest (FDI);  $MENA_i$  is a dummy variable that takes the value of one if the country belongs to MENA region (treatment group) and zero if the country is not in the MENA (control group);  $S\text{pring}_t$  is a dummy that takes the value of one for  $year \geq 2011$  (post-treatment) and zero for  $year < 2011$  (pre-treatment) and  $MENA_i.S\text{pring}_t$  is the interaction term of the previous dummies which is just a dummy variable that takes the value of one only for the treatment group in the post-treatment period. The DiD estimator is the OLS estimator of  $\beta_3$ , the coefficient of the interaction term between  $MENA_i$  and  $S\text{pring}_t$ . The next step is to include additional controls in the estimation, in order to control for observable variables that could affect the outcome of interest (i.e., FDI inflows). Therefore, equation 3 can be written as follows.

$$y_{it} = \beta_0 + \beta_1 MENA_i + \beta_2 S\text{pring}_t + \beta_3 MENA_i.S\text{pring}_t + \phi X_i + \epsilon_{it} \quad (4)$$

Where  $X_{it}$  can be a series of control variables related to economic and political determinants of FDI flows.

The DiD estimator is expected to be an unbiased estimate of the change in FDI inflows due to a political shock (i.e, the Arab Spring) if both groups were similar except for being subject to the treatment (i.e., the shock). However, this is a very strong assumption as countries are expected to be of different characteristics and contexts. To account for this bias, we utilise the propensity score matching (PSM) technique to estimate the average treatment effect of the treated (ATT). The PSM methodology identifies the average treatment effect by comparing the outcome of MENA countries and other countries which, *a priori*, have similar characteristics. Therefore, the PSM is expected to reduce the bias generated by any unobservable confounding factors. In this context, the propensity score can be defined as the conditional probability of the incidence of a political shock given pretreatment characteristics.

$$p(X) \equiv Pr(D = 1|X) = E(D|X) \quad (5)$$

where  $D = \{0, 1\}$  is the indicator of exposure to a political shock and  $X$  is the multidimensional vector of pretreatment host country specific characteristics. If the propensity score  $p(X_i)$  for country  $i$  is known, then the ATT can be estimated as follows:

$$\begin{aligned} \tau &\equiv E\{Y_{1i} - Y_{0i}|D_i = 1\} \\ &= E[E\{Y_{1i} - Y_{0i}|D_i = 1, p(X_i)\}] \\ &= E[E\{Y_{1i}|D_i = 1, p(X_i)\} - E\{Y_{0i}|D_i = 0, p(X_i)\}|D_i = 1] \end{aligned}$$

where the outer expectation is over the distribution of  $(p(X_i)|D_i = 1)$  and  $Y_{1i}$  and  $Y_{0i}$  are the potential outcomes in the two counterfactual situations of receiving a political shock and not receiving a political shock. However, this requires two conditions: (i) balancing of the pretreatment variables given the propensity score. If  $p(X)$  is the propensity score, then

$$D \perp X|p(X)$$

and (ii) unconfoundedness given the propensity score. Suppose that assignment to treatment (a political shock) is unconfounded, i.e.,  $Y_1, Y_0 \perp D|X$ , then assignment to treatment is unconfounded given the propensity score, i.e.,  $Y_1, Y_0 \perp D|p(X)$ . If the balancing condition is met, observations with the same propensity score must have the same distribution of observable (and unobservable) characteristics independently of being subject to a political shock. In other words, for a given propensity score, receiving a political shock is random and therefore treated and control units should be on average observationally similar. In this study, we employ a *probit* model to estimate the propensity score based on country specific political settings and economics development processes.

## 5. Dataset

Our dataset includes annual data from 1989 to 2015 for 146 countries including nineteen MENA countries, see Table 6 in the appendix. The variables of interest are FDI inflow (% GDP) and GDP annual growth rate. Both variables were extracted from the world development indicators (WDI) database of the World Bank. In addition, we use the *polity* index to proxy for country-specific political settings. The *polity* index, which comes from Marshall et al. (2016) database, varies from -10 to 10. The index is based on sub-scores for constraints on the chief executive, the competitiveness of political participation, and

the openness and competitiveness of executive recruitment. Higher values denote more democratic institutions. Marshall et al. (2016) define a polity within the range [6,10] as a coherent democracy, one in the range [-10,-6] as a coherent autocracy, and one in the range [-5,5] as an incoherent regime. Formally, it is computed as the difference between a democracy index and an autocracy index, each ranging from 0 to 10. See Table 1 for summary statistics for our dataset.

Table 1: Descriptive Statistics - overall sample

Variable		Mean	Std. Dev.	Min	Max	Observations
FDI	overall	3.357	5.230	-45.392	40.630	N = 3942
	between		4.044	-19.049	25.689	n = 146
	within		3.334	-30.375	29.066	T = 27
Polty	overall	3.055	6.668	-11.000	11.000	N = 3942
	between		6.118	-10.000	10.000	n = 146
	within		2.697	-12.575	13.870	T = 27
GDP	overall	3.421	4.408	-34.188	52.388	N = 3942
	between		3.004	-17.182	16.458	n = 146
	within		3.234	-25.524	39.351	T = 27

## 6. Empirical Results

To estimate our panel VAR model, Eq. 2, we follow the estimation routine suggested in Abrigo et al. (2016), who build on the generalized method of moments (GMM) framework<sup>7</sup>. The authors apply forward orthogonal deviation proposed by Arellano and Bover (1995) to remedy for the weaknesses of the first-difference transformation when estimating dynamic panel models<sup>8</sup>. We use information criteria to select the optimal lag order (i.e., in both panel VAR specification and moment condition). Based on the model selection criteria, first-order panel VAR is the preferred model, since it has the smallest value for the information criteria. Therefore, we fit a first-order panel VAR model using GMM estimation, see Table 2 for the estimated coefficients. The results in Table 2 suggest that FDI is positively related to institutional quality in the host country. More particularly, our panel VAR estimation shows that a one point increase in the *polty* index (i.e., indicating improvement in institutional quality in the host country) increases the FDI inflows (measured as a percentage of GDP) by 3.4%. The estimated coefficient is statistically different from zero at the one percent significance level. In order to estimate the FDI response to political shocks, we exploit our panel VAR set up to produce the impulse response functions (IRFs). However, it is important to confirm the stability of our model.

<sup>7</sup>The GMM estimator has been found to perform fairly well, especially in fixed T and large N.

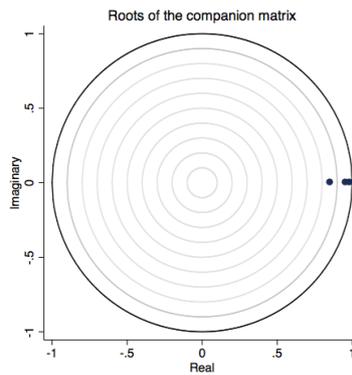
<sup>8</sup>They subtract the average of all available future observations, thereby minimizing data loss.

Table 2: Panel VAR estimation

Coeff.	Eq.		
	FDI	Polty	GDP
L.FDI	0.981***	0.01*	-0.004**
L.Polty	0.034***	0.853***	0.028***
L.GDP	-0.004**	-0.017**	0.961***

The stability of the panel VAR model implies that it is invertible and has an infinite-order vector moving-average (VMA) representation. This would ensure a meaningful interpretation to the estimated IRFs and forecast error variance decompositions (FEVD). Fig. 6 confirms the eigenvalues stability condition, where all accompanied values lie within the unit circle.

Figure 6: Eigenvalue stability condition



In addition to the stability condition of our estimation, we could employ the panel VAR estimation to investigate the Granger causality between the underlying variables included in the model. Results of the Granger causality tests, presented in Table 3, show that institutional quality (i.e., *polty*) Granger-causes FDI at the one percent confidence level.

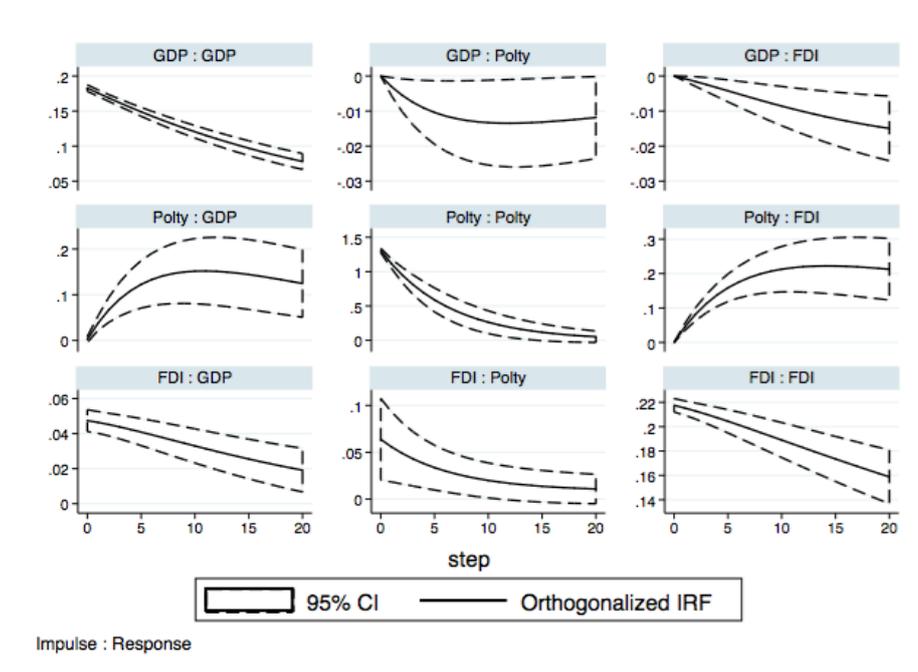
Table 3: Granger causality tests

Coeff.	Eq.		
	FDI	Polty	GDP
FDI	NA	2.914*	5.231**
Polty	60.475***	NA	22.22***
GDP	4.853**	5.579**	NA
ALL	70.388***	7.764**	23.378***

To this end, since that panel VAR estimates are seldom interpreted independently, we proceed to estimate the IRFs as we are interested in examining the impact of political

shocks on FDI within our system of equations. Although the simple IRFs have no causal interpretation, a shock on one variable is likely to be accompanied by shocks in other variables, as well, since the innovations  $\epsilon_{it}$  are correlated contemporaneously. Fig. 7 presents the IRFs from our panel VAR model for all variables in the system along with its confidence bands. The IRF confidence intervals are estimated using Gaussian approximation based on 200 Monte Carlo draws from the estimated panel VAR model <sup>9</sup>.

Figure 7: Impulse response functions IRFs from panel VAR model



As shown by Fig. 7, a one standard deviation (1SD) shock to the *polty* index would lead to an increase in the FDI inflows by 0.2% of the GDP. This response seems to be statistically significant at the five percent significance level. This implies that institutional quality in the host country is an important determinant of FDI flows. In addition, the IRFs show that institutional quality matters for economic development processes as well. More particularly, a 1SD shock to the *polty* index seems to have a positive impact on GDP growth, which is equivalent to about 0.1%. Again, this effect of the change of *polty* index on GDP growth is statistically different from zero at the five percent significance level. Thus, our results here suggest that institutional quality promotes growth and enhances FDI flows.

The second objective in our paper is to estimate the short-run effects of the Arab Spring on FDI inflows to the MENA region using the DiD estimator described in section 4. Table

<sup>9</sup>Estimates of the FEVD along with its standard errors and confidence intervals are available but not shown here to save on space.

4 presents the simple DiD estimation with no additional controls. Results in Table 4 provide the mean values of the outcome variable (i.e., FDI) for both control and treatment groups, both prior to and post the Arab Spring periods. The DiD estimator is equal to the difference across the two periods of the difference between treatment and control groups. Differencing the mean values of the outcome variables between the two periods for the treatment group gives the effect of the Arab Spring on FDI plus the effect of any common shock such as the global financial crisis (or a time trend) that affect both groups, MENA and non-MENA countries. The difference between periods for the control group provides an estimate of such additional non-MENA related factors. Therefore, differencing the estimate across periods for the treatment group with that of the control group should offer an estimate of the effect of the Arab Spring on FDI inflows.

Table 4: Simple DiD estimation with no controls

<b>Outcome var.</b>	FDI	S. Err.	t	$P > t$
<b>Baseline</b>				
Control	3.113			
Treated	1.878			
Diff (T-C)	-1.236	0.27	-4.58	0.000***
<b>Follow-up</b>				
Control	5.335			
Treated	3.81			
Diff (T-C)	-1.525	0.566	-2.69	0.007***
<b>Diff-in-Diff</b>	-0.289	0.627	-0.46	0.645

Defining the prior Arab Spring period as a baseline, the average FDI flows to the control group (non-MENA countries) were 3.113% while in the treatment group this figure was 1.878%. Moving to the post Arab Spring period ( $T \geq 2011$ ), it is noted that both groups had increased levels of FDI inflows. Specifically, FDI inflows have increased by 5.335 and 3.81 percentage points in the control and treatment groups, respectively. Thus, the simple DiD estimator is equal to  $-0.289$  percentage points. This implies that, on average, FDI flows have responded to the shock (Arab Spring) by decreasing their flows to the MENA region. However, the estimated DiD coefficient seems to be statistically insignificant.

Given the heterogeneity existing among countries in both groups (control and treatment), the DiD estimation is likely to be biased. To account for this bias, we employ the propensity score matching (PSM), thereby maximising the observable similarity between treatment and control groups. As an alternative to linear regression, the PSM analysis allows us to create the two groups that have similar characteristics so that a comparison can be made within these matched groups. Implementation of the PSM methodology follows the two step procedure whereby in the first step each country's probability (propensity score) of receiving a political shock is assessed conditional to a set of explanatory variables. We include the *polty* index and GDP growth as controls within the first stage of the model to ensure that the two groups are matched on similar characteristics: institutional quality and economic development process. Consequently, the treatment and control group countries are matched on the basis of their propensity

scores. We present the results in Table 5 based on the *kernel* matching method. The procedure involves taking each treated country (MENA) and identifying non-treated countries (non-MENA countries) with the most similar propensity scores. As the linear regression estimates in Table 4, the matching results in Table 5 suggest that FDI flows into the MENA region have dropped, on average, by 0.854% as a response to the shock after the Arab Spring. The estimated DiD coefficient is statistically significant at the five percent level.

Table 5: DiD estimation after matching

<b>Outcome var.</b>	FDI	S. Err.	t	$P > t$
<b>Baseline</b>				
Control	2.581			
Treated	1.947			
Diff (T-C)	-0.633	0.174	-3.64	0.000***
<b>Follow-up</b>				
Control	5.298			
Treated	3.81			
Diff (T-C)	-1.487	0.363	-4.1	0.000***
<b>Diff-in-Diff</b>	-0.854	0.403	-2.12	0.034**

## 7. Conclusion

FDI flows are an important driving force of economic growth due to their positive externalities within the host country. Although FDI, as a long-term investment, may be able to withstand crises more effectively, empirical evidence shows that FDI might be very sensitive to political instability. Therefore, this study tried to assess the FDI response to political shocks. To do so, the paper proceeded in two stages. First, we estimated a panel VAR model for 146 countries over the period of 1989-2015. We used the impulse response functions (IRFs) resulted from our panel VAR model to examine the effects of political shocks on FDI flows in the overall sample. Second, drawing on the experience of the MENA region, we exploited the incidence of the Arab Spring to estimate the short run effects of sudden political shocks on the FDI flows. For this purpose, we employed the differences-in-differences (DiD) framework. To account for possible DiD bias arises from cross-country heterogeneities, we utilised the propensity score matching (PSM) to compare the outcome of interest (i.e., FDI flows) in countries with similar *polty* scores and economic growth rates.

To this end, our results shows that institutional quality in the host country is an important determinant of FDI flows. This empirical evidence supports many studies in the literature such as Harms and Ursprung (2002) and Busse (2003), while contradicts the findings in other studies such as Li (2009) and Schulz (2009). In addition, we find evidence that the Arab Spring, as a sudden political shock, has led to a drop in FDI flows to the MENA region. Our findings are of a significant importance to policy makers who wish to evaluate the role of sudden political shocks in distorting FDI flows. Constantly erupting political shocks tend to shake investors confidence, creating unnecessary turbulences to

the macroeconomic fundamentals, and negatively impacting development plans. And FDI flows are not immune to those negative impacts. Therefore, policy makers should design timely and appropriate policy responses to political shocks, given their negative effect on FDI flows.

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## Appendix

Table 6: A list of countries in the dataset

Algeria*	Czech Republic	Israel*	Nepal	Sudan
Angola	Denmark	Italy	Netherlands	Suriname
Argentina	Djibouti*	Jamaica	New Zealand	Swaziland
Armenia	Dominican Republic	Japan	Niger	Sweden
Australia	Ecuador	Jordan*	Nigeria	Switzerland
Austria	Egypt, Arab Rep.*	Kazakhstan	Norway	Syrian Arab Republic*
Azerbaijan	El Salvador	Kenya	Oman*	Tajikistan
Bahrain*	Eritrea	Kuwait	Pakistan	Tanzania
Bangladesh	Estonia	Kyrgyz Republic	Panama	Thailand
Belarus	Ethiopia	Lao PDR	Papua New Guinea	Togo
Belgium	Fiji	Latvia	Paraguay	Trinidad and Tobago
Benin	Finland	Lebanon*	Peru	Tunisia*
Bhutan	France	Liberia	Philippines	Turkey
Bolivia	Gabon	Libya*	Poland	Turkmenistan
Botswana	Gambia, The	Libya*	Portugal	Uganda
Brazil	Germany	Lithuania	Qatar*	Ukraine
Bulgaria	Ghana	Macedonia, FYR	Romania	United Arab Emirates*
Cambodia	Greece	Madagascar	Russian Federation	United Kingdom
Cameroon	Guatemala	Malawi	Rwanda	United States
Canada	Guinea	Malaysia	Saudi Arabia*	Uruguay
Central African Republic	Guinea-Bissau	Mali	Senegal	Uzbekistan
Chad	Guyana	Mauritania	Sierra Leone	Venezuela, RB
Chile	Haiti	Mauritius	Singapore	Vietnam
China	Honduras	Mexico	Slovak Republic	Yemen, Rep.*
Colombia	Hungary	Moldova	Slovenia	Zambia
Comoros	India	Mongolia	Solomon Islands	Zimbabwe
Congo, Rep.	Indonesia	Morocco*	Somalia	
Costa Rica	Iran*	Mozambique	South Africa	
Croatia	Iraq*	Myanmar	Spain	
Cyprus	Ireland	Namibia	Sri Lanka	

Note: \* demotes a country in the MENA region.