

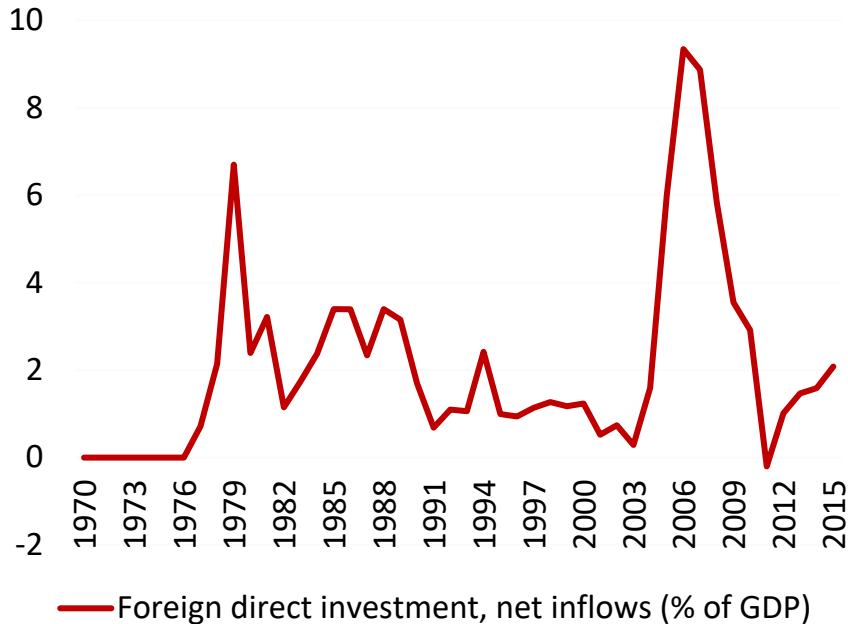
Foreign direct investment and corruption in Egypt: A co-integration analysis

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Motivation: Some worrying figures!

FDI and Growth in Egypt



Source: World Bank's World Development Indicators (WDI)

- Despite the promising successes and the increase in FDI as a percentage of GDP, Egypt continues to struggle with important challenges confronting its investment policy.

Corruption Perception Index for Egypt

Period	Score	Rank
80-89	1.37	41 out of 41
90-99	2.57	49 out of 99
00-09	3.18	80 out of 180
10-15	3.28	104 out of 168

Source: Transparency International (TI)

- Bureaucracy is identified as a key constraint by business in Egypt.
- Corruption in Egypt appears to be independent of time for the whole life of the series.

Empirical evidence about corruption: What do we know? And what we do not!

- Few studies report on corruption and FDI in developing countries (corruption data shortage).
- There is even less evidence on the causal pathways of inter-country corruption and FDI.
- Studies assessing the impact of corruption on FDI are inconclusive as to whether corruption hinders or enhances FDI.
 - Increase the cost of doing business
 - Act as a “helping hand” to substitute for poor governance (Efficient Grease hypothesis)
 - Has no effect

Objectives

- 1) Identify determinants of FDI in Egypt.
- 2) Provide a comprehensive evidence on the effect of perceived corruption on FDI using a country approach and time series data.
- 3) provide historical annual estimates using a back-casting technique to overcome the shortage in corruption data.
- 4) provide a source of relevant and reliable information for both investors and policy makers.

Empirical approach

- Drawing from Li and Liu (2005), we examine the effects of corruption on FDI inflows in Egypt using the following equation:

$$fdi_t = a_0 + a_1 \mathbf{cor}_t + a_2 g_t + a_3 y_t + a_4 hk_t + a_5 trade_t + a_6 inv_t + a_7 X_t$$

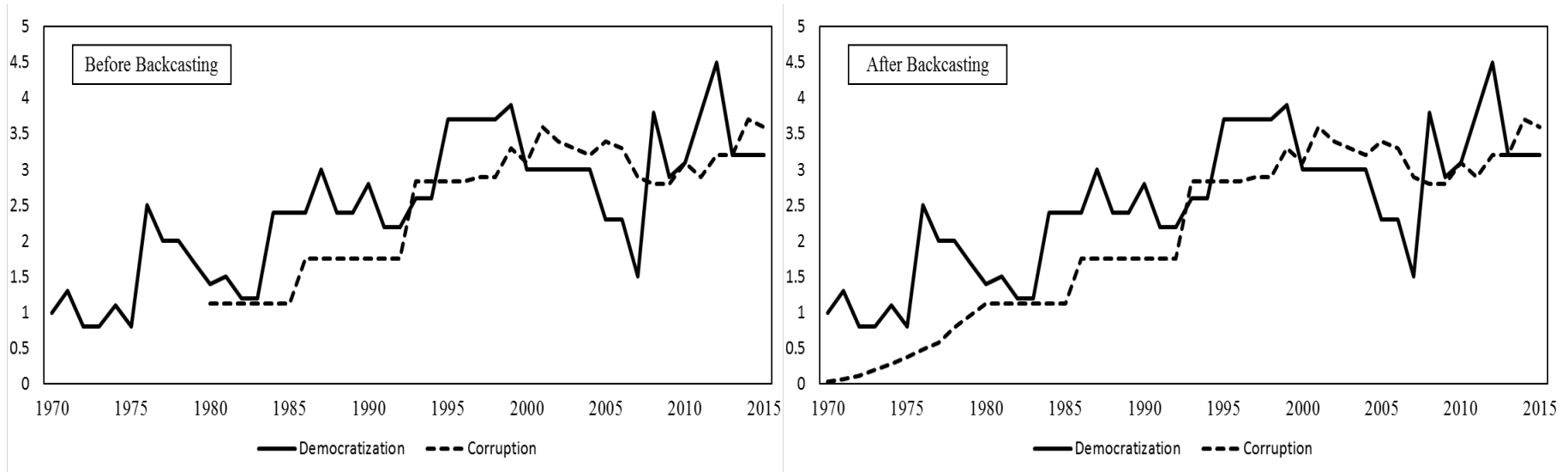
With $a_1 \leq 0$; $a_2 \leq 0$; $a_3 > 0$; $+a_4 > 0$ or < 0 ; $a_5 < 0$; $a_6 > 0$ $> a_7 > 0$

- g_t is the real GDP growth rate; y_t is the per capita real GDP (market size); hk_t is the secondary school enrolment ratio (human capital); $trade_t$ (openness); inv_t is the fixed capital stock as a percentage of GDP; and X_t is a vector of macroeconomic variables including infrastructure, as proxied by Mobile cellular subscriptions per 100 people; and inflation, as proxied by percentage changes in consumer prices.

Data

Variable	Description	Measure	Unit	Source
fdi_t	The natural logarithm of FDI inflows to real GDP	FDI	Percentage per annum	UNCTAD
cor_t	Corruption Perception Index (CPI)	Corruption	Index – ranges from 0 to 10	TI
g_t	The natural logarithm of real GDP growth rate (GDP deflator with base year 2005 is used as a deflator)	Market dynamics	Percentage per annum	WDI
y_t	The natural log of per capita real GDP	Market size	US\$	WDI
hk_t	The natural logarithm of secondary school enrolment to gross enrolment ratio	Human capital	Percentage per annum	WDI
$trade_t$	The natural logarithm of exports and imports of goods and services to real GDP	Openness	Percentage per annum	WDI
inv_t	The natural logarithm of fixed capital stock to real GDP	Private domestic investment	Percentage per annum	WDI
X_t	Mobile cellular subscriptions per 100 people ($infra_t$)	Infrastructure	Percentage per annum	WDI
	Percentage changes in consumer prices ($inflation_t$)	Inflation rate		
dem_t	Democracy Index	Back-cast corruption	Index	QoG

Data: Back-casting corruption



- We backward extrapolate (back-cast) the missing corruption data from 1970 to 1980 using the Democracy Index with annual back runs to 1946.
- Corruption and democracy (the benchmark) are highly correlated (64%) over the period 1980-2015.
- The back-casting methodology is ultimately designed to provide historical annual estimates that are consistent over time and preserve the broad patterns observed in the published corruption estimates.

Results: Unit Root tests and integration order

Variable	τ_{μ}		τ_T	
	ADF	PP	ADF	PP
Level				
fdi	-2.740*	-2.354	-2.725	-2.725
cor	-1.165	-1.159	-2.066	-2.021
g	-3.621***	-3.621***	-3.814***	-3.814***
y	-0.492	-0.118	-3.071	-2.234
hk	-1.836	-1.836	-1.941	-1.940
trade	-2.284	-2.489	-2.352	-2.364
inv	-1.851	-1.972	-2.931	-2.123
infra	2.639	0.960	2.527	-0.570
inflation	-2.056	-2.547	-2.214	-2.878
1st Difference				
fdi	-4.189***	-8.238***	-4.211***	-8.243***
cor	-7.966***	-4.125***	-7.937***	-4.890***
g	-7.615***	-10.675***	-7.554***	-11.826***
y	-4.026***	-3.478**	-3.812**	-3.381*
hk	-5.565***	-4.913***	-6.187***	-6.662***
trade	-5.769***	-5.769***	-5.877***	-5.877***
inv	-5.374***	-5.272***	-5.626***	-5.648***
infra	-4.615***	16.073***	-4.104**	5.591***
inflation	-10.902***	-11.481***	-10.868***	-11.115***

Results: Johansen Cointegration and long run relationship

Part A: LR test based on Maximal Eigenvalue of the stochastic matrix (λ_{\max})

Null	Alternative	Statistic	95% C.V.	Eigenvalues
$r = 0$	$r = 1$	229.644*	197.371	0.821
$r \leq 1$	$r = 2$	155.454	159.531	0.636
$r \leq 2$	$r = 3$	111.966	125.615	0.531
$r \leq 3$	$r = 4$	79.445	95.754	0.438
$r \leq 4$	$r = 5$	54.632	69.819	0.407
$r \leq 5$	$r = 6$	32.162	47.856	0.333
$r \leq 6$	$r = 7$	14.727	29.797	0.171
$r \leq 7$	$r = 8$	6.685	15.495	0.115
$r \leq 8$	$r = 9$	1.438	3.841	0.033

Part B: LR test based on Trace of the stochastic matrix (λ_{trace})

Null	Alternative	Statistic	95% C.V.	Eigenvalues
$r = 0$	$r \geq 1$	73.933*	58.434	0.821
$r \leq 1$	$r \geq 2$	43.488	52.363	0.636
$r \leq 2$	$r \geq 3$	32.521	46.231	0.531
$r \leq 3$	$r \geq 4$	24.813	40.078	0.438
$r \leq 4$	$r \geq 5$	22.471	33.877	0.407
$r \leq 5$	$r \geq 6$	17.435	27.584	0.333
$r \leq 6$	$r \geq 7$	8.042	21.132	0.171
$r \leq 7$	$r = 8$	5.247	14.265	0.115
$r \leq 8$	$r = 9$	1.438	3.841	0.033

	fdi	cor	g	y	hk	trade	inv	Infra	inflation
-1.0000		-1.7634 (1.0427)	-0.8885 (0.2076)	0.0538 (0.0067)	-0.5521 (0.0714)	0.0636 (0.0222)	-0.4555 (0.0737)	-0.1587 (0.0255)	0.6927 (0.0820)

Results: Vector Error Correction estimation, dependent variable, FDI

Variables	Coefficients	Std. Error
Constant	-0.645599	0.783026
$\Delta fdi(-1)$	-0.028243	0.226209
$\Delta cor(-1)$	-0.010614	1.410177
$\Delta g(-1)$	0.009303	0.131366
$\Delta y(-1)$	0.042299	0.029973
$\Delta hk(-1)$	0.251039*	0.152810
$\Delta trade(-1)$	-0.013956	0.050081
$\Delta inv(-1)$	0.131092	0.126108
$\Delta infra(-1)$	-0.230419***	0.100108
$\Delta inflation(-1)$	-0.088315	0.087851
ECT_1	-0.298447**	0.149910
R-squared	0.721886	
Adjusted R-squared	0.463588	
F-statistic	2.864933***	
Prob. (F-statistic)	0.009740	
Diagnostic Problems ^a : None		

- Robustness checks: ARDL and DOLS yield the same results.

Conclusion: Main findings

- Results show a positive yet insignificant relationship between FDI and corruption in Egypt.
- This result suggests that foreign investors might be willing to bribe the regional authorities to save their time and to move in front of the bureaucratic lines.
- Since corruption is not found to hinder FDI inflows, treating corruption should be based on sound legal procedures that infringe neither on the freedom of FDI nor on the degree of openness of the economy, which are the real stimulants of FDI in Egypt.

Conclusion: Policy implications

- (i) Corruption is a means of economic expansion by overcoming restrictive laws or behaviour such that the value of economic expansion surpasses the extra costs of corruption, thereby supporting the EGH ;
- (ii) Rent seeking in Egypt may provide incentives to government concerned officials to speed up formalities and even to bend the rule, the government should consider other forms of incentives for government officials to get rid of corruption;
- (iii) Market size and domestic agglomerations are more influential than other determinants to FDI.

Thank you.