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Pyramid capitalism: Cronyism, regulation, and firm productivity in Egypt

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Abstract

We present novel evidence suggesting that cronyism had a negative effect on economic growth in Egypt, during a period when international organizations praised the country for its reforms of business regulation. We identify 385 politically connected firms under the Mubarak regime. This large database allows us to show that 4-digit sectors that experienced crony entry between 1996 and 2006 exhibited lower aggregate employment growth subsequently than those that did not. In manufacturing, labor productivity grew more slowly in sectors that experienced crony entry. Ample, though not definitive evidence suggests that this effect was causal. Crony entry skewed the distribution of employment toward smaller, less productive firms; crony firms do not appear to have entered sectors that would have also grown more slowly even in the absence of crony entry; and they enjoyed multiple regulatory and fiscal privileges that reduced competition and investments by non-crony firms, including trade protection and energy subsidies. These privileges account for the higher profits of politically connected firms.

Keywords Cronyism · Growth · Political connections · Productivity · Regulation

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1 Introduction

Research on the value of political connections has given rise to a central question: does cronyism have only distributional consequences, or does it also influence economic growth? Even if crony firms grow more rapidly, their growth can come at the expense of unconnected firms in their sector. Their effect on growth could therefore be negative even if they themselves are successful. Data at the sector level are necessary to discern these effects. However, such analyses are feasible only if data are sufficiently ample to reveal connected firms operating in many sectors. We exploit novel data from Egypt that, unlike data available in prior research, has this characteristic and reveals that cronyism is likely to have a negative effect on growth.

During the period we investigate, Egypt became a star reformer according to the World Bank's Doing Business indicators, which ranked it as the top reformer of laws and regulations blocking private sector development in 2006/07.[1] President Hosni Mubarak's son, Gamal, spearheaded these efforts. However, he also oversaw a dramatic increase in the economic activities of connected firms. Because of the regulatory and other advantages cronies enjoyed, they came to operate in about half of all narrowly-defined (4-digit) sectors by 2006.

This historical episode allows us to examine the growth effects of cronyism. We compare growth in employment in narrowly-defined 4-digit sectors in which no firms were initially connected, but then experienced crony firm entry, with the growth in employment of similar 4-digit sectors that were initially unconnected and remained so. For a smaller sample of firms in manufacturing sectors only, we undertake the same exercise looking at labor productivity and wage growth. Between 1996 and the end of the Mubarak regime in 2011, both employment and labor productivity growth were significantly slower in sectors that experienced crony entry.

We cannot entirely exclude the possibility that unobserved features surrounding crony entry account for the results we present. However, ample indirect evidence supports a causal interpretation. First, connected firms did not enter sectors that would have grown more slowly even in the absence of crony entry. In other (developing) countries, the same sectors as those that experienced crony entry in Egypt grew, if anything, *more* rapidly than other sectors. In addition, cronies entered sectors with a larger share of young firms, a signal that growth opportunities in these sectors were at least as promising as in sectors that they did not enter.

Second, the evidence points to channels through which connected firms might have suppressed the growth of unconnected firms in their sector. For example, Aghion et al. (2001), though not looking at cronyism, conclude that when some firms in an industry enjoy large cost advantages over the remaining firms, innovation and therefore productivity growth in the industry decline. The connected firms we identify also enjoyed large cost advantages over unconnected firms, derived from state-authorized privileges and, in manufacturing sectors, experienced lower labor productivity growth. Another implication of the Aghion et al. argument is that the distribution of firms should be

[1] It cut the minimum capital required to start a business, from 50,000 Egyptian pounds to 1000; reduced fees for registering property from 3% of the property value to a low, fixed amount; eased construction permitting.; launched new one-stop shops for traders at Egyptian ports; cut the time to import by seven days and the time to export by five; and it established a new private credit bureau (World Bank 2007).

skewed toward small, unproductive firms in sectors where one firm enjoys a large cost advantage. Egyptian sectors that experienced crony entry in fact exhibit more skewed distributions than those that did not.

In addition, we document that crony firms benefited from policy privileges not enjoyed by other firms across a wide range of regulatory and fiscal domains, including subsidies and trade protection. Crony firms were also significantly more profitable and those greater profits can be accounted for by the firm-specific policy privileges they enjoyed. Taken together, the evidence indicates that, in the case of Egypt, privileges were sufficiently large to have slowed aggregate growth.

Section 2 reviews our contributions to the literature on cronyism. Section 3 surveys the modalities and evolution of cronyism in Egypt. Section 4 characterizes the theoretical mechanism through which the presence of profitable cronies reduces competition and thus economic growth. Section 5 describes our sample of connected firms. Section 6 provides evidence that cronyism reduces long-term aggregate employment growth and, in a smaller sample of firms in manufacturing sectors, reduces labor productivity and wage growth. Section 7 documents that crony firms enjoy multiple regulatory and fiscal privileges that reduce competition and account for slower aggregate growth in these sectors. Section 8 reveals that connected firms are larger and more profitable. Section 9 asks whether the regulatory and fiscal privileges of connected firms explain their higher profits. The final section concludes with a discussion of the broader implications of the results.

2 What do we know about cronyism?

The literature on political connections addresses three concerns: the extent to which political connections are valuable; the modalities through which politically connected firms receive policy favors; and the degree to which political connections affect firm performance. We address these issues, as well, but our data also allow us to assess the aggregate economic impact of cronyism.

Beginning with Fisman's (2001) seminal contribution, scholars have documented the value of political connections by investigating movements in the stock prices of connected relative to other firms in response to exogenous changes in the probability of regime change. In Egypt, Chekir and Diwan (2015) estimate the value of political connections for 22 connected, publicly traded firms to be about 13 to 16% of the firms' value, close to Fisman's estimates of the value of connectedness in Suharto's Indonesia. Acemoglu et al. (2014) show that street protests in Egypt are associated with differential stock market returns for firms connected to the regime.

The greater value of connected firms could be due to the happy coincidence that talented entrepreneurs are also close to the leader, or to the possibility that friends of the ruler are less vulnerable to predation. Instead, though, a large literature has found evidence that connected firms simply enjoy policy advantages that other firms do not (e.g., Cull and Lixin Colin 2005 for China; Johnson and Mitton 2003 for Malaysia; Khwaja and Mian 2005 for Pakistan; Oberholzer-Gee and Leuz 2006 for Indonesia; Claessens et al. 2008 for Brazil; and Faccio et al. 2006 based on cross-country panel data; see also Boubakri et al. 2008 and Goldman et al. 2008). Fisman and Wang (2013)

shows that safety regulations are more loosely enforced in connected firms: workplace fatalities in connected firms in China are five times higher than in non-connected firms.

Most of these studies find that connected firms have better access to finance (higher debt), despite their higher default rates and more frequent bailouts. Connected firms also enjoy tax advantages, greater market power and preferential access to government contracts, as in Rijkers et al. (2014). They examine 214 Tunisian firms that were expropriated after the Jasmine Revolution because members of the Ben-Ali family owned them; these companies disproportionately benefited from FDI restrictions and licensing requirements. Our paper advances this line of research by demonstrating other advantages that connected firms receive, including energy subsidies and trade protection.[2]

The effects of cronyism on the performance of connected firms are, in theory, ambiguous. On the one hand, connected firms benefit from privileges that might boost productivity or profitability. Their political connections might also insulate them from failure and predation. On the other hand, connected firms could have worse financial results because of obligations that they take on at the behest of government, as Chekir and Diwan (2015) emphasize. For example, connected firms may be obliged to create more jobs than business conditions merit, or to finance the electoral campaigns of their political allies.

Most researchers have found that connected firms perform better (Roberts 1990 and Goldman et al. 2008, for firms in the U.S., and Ramalho 2003 for firms in Brazil). Authors taking a more historical approach (Voth and Ferguson 2008, looking at Nazi Germany, and Haber and Maurer 2007, examining connected firms under the dictatorship of Porfirio Díaz in México) have reached similar conclusions. Boubakri et al. (2008) document that firms' financial performance improves after they establish political connections. Ukrainian firms in regions most supportive of President Viktor Yuschenko exhibited significant productivity increases, and these increases were greatest among those types of firms that were most exposed to political decisions at the national level (Earle and Gehlbach 2015).

However, consistent with the ambiguous effects of connectedness, a few studies show that connected firms perform worse than comparable non-connected firms. Chekir and Diwan (2015), in their study of a smaller sample of connected firms in Egypt, present evidence that connected firms were significantly less profitable, measured in terms of net income relative to the book value of the firm's capital stock.[3] Firms managed by connected CEOs in France create more jobs and pay higher wages than non-connected firms, but are also less profitable (Bertrand et al. 2007). Using a large cross-country panel of mostly European countries, Faccio (2007, 2010) also concludes that connected firms exhibit lower returns on assets, an effect that is strongest in poorer and more corrupt countries.

We find that connected firms exhibit higher returns on assets compared to non-connected firms. However, our data also allow us to analyze the aggregate economic

[2] Kroszner and Stratmann (1998) show that political influence affects regulatory protection in the United States, but influential firms are far from "cronyistic". Rather, legislators simply pay more attention to, and are more susceptible to lobbying by, economic sectors that are important in their districts.

[3] Chekir and Diwan (2015) also find that connected firms, despite lower profitability, exhibit higher stock market value. This could be consistent with the market value attached to the lower risk of predation and expropriation of connected firms.

effects of connected firms. First, we have an unusually large sample of 385 connected firms, three or four times the size of the samples in nearly all prior research. They are spread across numerous sectors, key to examining the aggregate impact of crony entry on the economy. Second, because of a significant policy shift in Egypt, many of the connected firms in our sample emerged during a short period in the late 1990s and early 2000s. This shift allows us to compare the evolution of employment and labor productivity in sectors that experienced crony entry and those that did not.

In principle, it is ambiguous whether profitable connected firms have positive or negative aggregate economic effects. Their insulation from predation might lead to innovation and growth that would not otherwise occur, and therefore a positive aggregate effect on economic growth. However, the arguments in Aghion et al. (2001) suggest that if connected firms enjoy substantial regulatory and other privileges that other firms do not, aggregate growth should slow in the sectors that they enter. We document those privileges and find substantial evidence that aggregate long-term employment and labor productivity growth decline after crony entry.

3 Cronyism in Egypt

The Middle East literature on Arab capitalism contains rich analyses of how autocrats allowed business elites to dominate the business sector in exchange for support for the regime. Qualitative research has documented barriers to entry that excluded opponents and provided privileges to a small coterie of friendly capitalists (Henry and Springborg 2010; Owen 2004; Heydemann 2014; King 2009). In Tunisia, the Ben Ali and Trabelsi families monopolized business opportunities and even expropriated the real estate and business holdings of wealthy elites. Similar stories about favoritism and insiders abound in Syria, Libya, Yemen, and Algeria, where political cronies seem to control large chunks of the private sector (Albrecht 2002; Alley 2010; Haddad 2012; Tlemcani 1999).

In Egypt, the presence of connected firms in the economy significantly increased with the rise in political influence of Hosni Mubarak's son, Gamal Mubarak, starting in the late 1990s. Under Gamal's influence, the country accelerated privatization and financial sector and trade reforms. However, even as it liberalized the economy on some dimensions, the government erected barriers to entry on others. Government permission was necessary to take advantage of many of the reforms. For example, tourist resorts and housing projects were built on formerly government-owned land; investments in oil and gas required government approval; new banks and new factories in energy-intensive manufacturing sectors, such as cement or steel, required government licenses; imports of selected products required exclusive licenses; quality controls and other non-tariff barriers replaced tariffs in shielding domestic producers from foreign competition.

The connected businessmen we identify as cronies were well-placed to influence these decisions: they were not only personally well connected with the political leadership, but they themselves also occupied important posts in government, the ruling party, parliament, and various influential boards and committees (Demmelhuber and Roll 2007; Roll 2010; Loewe 2013). Observers argue that cronyism thrived in the "businessmen" cabinet headed by Ahmad Nazif from 2004 to 2011

(Kienle 2004 and Sfakianakis 2004). Connected firms captured the new opportunities created by liberalization: massive real estate projects and construction, tourism in coastal areas, oil and gas, selected manufacturing sectors, banking, and telephony, as well as the local distribution of international consumer brands (Roll 2010; Loewe 2013; Ahram Online 2010, 2011).

Our data confirm these reports: the firms that we identify as politically connected are concentrated in tourism (hotel and restaurants, tour operators, transport), real estate, construction, wholesale & retail trade, mining, finance, business services, and manufacturing sectors (see Online Appendix Table A1). Trials of leading businessmen since the Arab Spring have shed light on land appropriation at below-market prices; the manipulation of government regulations to stifle competition; subsidized borrowing from state banks; and privileged access to subsidized energy and state procurement contracts (Ahram Online 2010, 2011). A Minister of Housing identified as a crony in our sample arranged for state-owned land to be transferred to a business partner at a substantially below market price; a close friend of Hosni Mubarak, also identified as a crony in our sample, and who was also a business partner of Gamal Mubarak, similarly acquired a state-owned retail chain at a low price, while arranging for various trade protection measures to protect the chain from competition from imported clothing. Another crony in our sample led the NDP policy committee and owned one of the largest steel companies in Egypt (Ezz Steel). He arranged for changes to the competition law that effectively exempted his firm from liability under the law; the Egyptian Competition Authority dismissed a case against the firm in 2009.

4 Implications of cronyism for growth

Given the regulatory advantages they enjoy, cronies should grow faster than incumbent firms in their sectors. The question is whether such growth comes at the expense of incumbent, unconnected firms, eventually slowing sector growth. One possibility is that state privileges give connected firms in a sector access to lower-cost inputs, while raising input costs for unconnected firms in the sector. For example, if more credit or cheap energy is directed to connected firms at low cost, credit and energy may be more expensive for unconnected firms. The unconnected firms then grow more slowly than they otherwise would have, and overall sector growth may therefore be slower than it otherwise would have been.

Another possible channel through which cronyism might suppress sector growth emerges in Aghion et al. (2001).[4] In their model, growth depends on cost-reducing innovative activity. Firms invest more in innovation to the extent that small reductions in cost lead to large gains in market share.[5] However, when leading firms in an industry already enjoy substantial cost advantages, both leading and trailing firms have weaker incentives to innovate. For the trailing, high-cost firms, even successful innovation will be insufficient to allow them to gain market share. They instead remain small and

[4] See also Parente and Prescott (2002).

[5] Innovation therefore allows firms to "escape competition," at least temporarily. They argue that the "escape from competition" effect outweighs the traditional argument that perfect competition suppresses innovation by reducing the rents from innovative activity.

operate in local market niches, often in the informal sector. The leading firms also confront lower returns to innovation, since their market share is already large. Aghion et al. predict that since all firms are more reluctant to invest in growth-promoting innovation, industry growth declines. Moreover, since trailing firms remain smaller than they otherwise would, the size distribution of firms is also affected, shifting downwards.

The intuition underlying Aghion et al. (2001) extends naturally to the analysis of connected firms and can account for the effects that we observe. The advantages of crony firms include privileges that lower their costs, such as favorable access to capital and tariff exemptions. Hence, if regulatory privileges are sufficiently large, as the evidence below suggests was true in Egypt, the entry of crony firms into a previously unconnected sector should reduce sector growth and shift the distribution of firm sizes downwards. We find evidence for each of these. In addition, we observe evidence of the assumptions that underlie this intuition: connected firms received large subsidies that were not available to other firms in their sectors; connected firms were more profitable than other firms of similar size; and the subsidies they received account for those profits.[6]

5 Firm data

The analyses below rely on numerous data sources to identify politically connected firms, calculate firm and sector performance, and assess the extent to which connected firms enjoy regulatory and other privileges that unconnected firms do not. This section details the data sources for each of these.

5.1 Identifying connected firms

Connected firms are more likely to suppress long-term growth and to shift the distribution of firm sizes in the sectors they enter if their privileged status gives them substantial cost advantages over other firms in their sectors or imposes other major barriers to entry on those firms. For example, in Egypt we identify generous energy subsidies and trade protection as key policies that favor connected firms. These policies were determined by the highest officials in government and in the ruling party (NDP). Hence, we define connected firms as those that are owned or managed by individuals who have the political power to secure approval of this national legislation.

To identify connected individuals, we apply two principles. First, we distinguish lobbyists and special interests, who seek to influence public policy at the margin, from individuals who have the power to introduce new economic legislation that establishes significant barriers to market entry and competition. Second, they should be identified through "ex ante" criteria, whether they are in a position to influence public policy in their favor, rather than "ex post" criteria, the observation that they enjoy significant

[6] Another outcome would have been possible if the privileges of connected firms were, in fact, not so large as to deter competition and thus investment by other firms in their sectors. If the privileges they enjoyed were less generous and did not reduce the expected profits from investments by other firms in their sectors, then sector growth could in fact have been *faster* in the presence of cronies. Contrary to this case, though, we find that the presence of connected firms suppresses sectoral growth.

state privileges.[7] Given the characteristics of Egyptian policy making, connected individuals satisfy one of the following two criteria: (i) they have a high political post in the ruling National Democratic Party (NDP) or are members of the cabinet of ministers of the central government; [8] (ii) they are close members of the Mubarak family (i.e., Hosni Mubarak's sons and his brother in law).[9] The information on high ranking members of the ruling party or the cabinet of ministers that own or manage a business in the Mubarak era is publicly available in Egypt. We also interviewed managers of banks and private equity funds, lawyers and NGOs (e.g., anti-corruption organizations) in the process of the work to confirm that we had a comprehensive list of businessmen who had high political posts, with the ability to direct public policy governing the private sector.[10]

To identify the connected firms, we matched the names of the politically connected businessmen identified in the first step to the managing directors and major shareholders of firms that were at some point listed on the Cairo stock exchange.[11] Most large firms were, in fact, listed on the stock exchange, since gains from selling shares of listed companies were exempted from taxation. The names of 30 of the businessmen identified in step one unambiguously matched the names of board members or major shareholders of 104 firms. Since some of these 104 firms are holding companies or investment funds masking larger business conglomerates, we used publicly available information on the listed companies to identify the names of up to two tiers of firms connected to these conglomerates (i.e., firms that were partially owned by a politically-connected, listed company). This allowed us to identify smaller connected firms that had never been listed on a stock exchange. The process yielded a total of 385 firms that are unambiguously controlled by a connected businessman.

Of the 385 firms that we identify as connected, 334 have at least one connected businessman with an ownership stake; 51 additional firms have a politically connected board member, but were not owned by a politically connected businessman.[12] We thus obtain two different definitions of politically connected firms. The narrower definition

[7] "Ex post" criteria include the use of lists of owners of confiscated assets after a regime change. The "ex post" approach may yield fewer false positives (the identification of cronies who, in fact, never exercised their proximity to the president for economic advantage). However, the approach may also yield false negatives to the extent that firms connected to the old regime also engaged in crony behavior subsequently, establishing close relationships with new leaders and avoiding asset confiscation.

[8] Many countries have conflict of interest laws that could force individuals to sell their businesses when they take high-ranking political office. In Egypt such a law was introduced only in 2012 and has not been enforced yet. No such law was in place during the period of our study.

[9] Faccio (2007) follows "ex ante" criteria similar to the ones we use, but also includes legislators within her universe of politically connected individuals. We assume that in an autocratic setting such as Egypt's, members of parliament exercise little formal influence over policy.

[10] We also include Mr. Alaa Abd El Maksoud Arafa, a long-term friend of the Mubarak family who did not have a high political post during Mubarak's rule. However, he has been a close business partner and co-owner of a holding company with Gamal Mubarak. The firms connected to him have been identified through this holding company and are thus also directly connected to Gamal Muabrak, satisfying criteria (ii).

[11] The names of major shareholders and managing directors of companies formerly listed on the Cairo stock exchange are publicly available. We identified these through online searches using financial portals such as Mubasher or Beltone. We applied a cut-off value for ownership by a connected businessman of 10%.

[12] We do not have information on firms owned by the military since ownership data of the military beyond anecdotes is not available. The military in Egypt does not need to disclose its budget details to the Egyptian government. Moreover, we do not identify private firms that were never listed or have never been partially owned by a stock market-listed company.

is the first, firms owned by connected businessmen. The second, broader definition combines firms owned by connected businessmen with firms that only have a connected board member.

About two-thirds of the 385 firms were owned by businessmen who were either ministers in the government or led a policy committee in the NDP after 2001. Among them, connected owners of firms in the transport and real estate sectors were also ministers of Transport and of Housing, Utilities & Urban Development. A prominent businessman directed the Ministry of Trade and Industries; after the 2011 regime change, he faced charges of corruption and illicit profiteering.[13] Ahmed Ezz owned several companies in the steel and ceramic sectors. He chaired the Parliament's budget committee in 2002 and then in 2005 became the NDP's secretary-general and a leading member of the Policy Secretariat Committee of the NDP, which originated most of the government's economic policy actions (Demmelhuber and Roll 2007; Roll 2010). His holdings in the steel and ceramic sectors benefited not only from favorable interpretations of competition law, mentioned earlier, but also from generous energy subsidies and trade barriers (e.g., exclusive import licenses or quality controls for imports). Some of these were introduced in 2005, when he joined the policy committee. The remaining one-third of the connected firms in our sample were controlled by either long-term friends of Hosni Mubarak dating from the times they served together in the military, or co-founders of a large investment bank partly-owned by a Cyprus-registered company that in turn was owned by the Mubarak family.

Assessing the aggregate impact of cronyism requires analyzing detailed sector data to capture the impact of the entry of crony firms on these sectors' market structures and aggregate long-term growth. Most of our analyses therefore examine the performance and regulatory exposure of narrowly-defined (four-digit) sectors, since we argue that the aggregate effects of regulatory privileges of connected firms include the spillovers that those privileges have on unconnected firms that compete in connected firms' economic markets. Because of the large number of connected firms we observe, and substantial dispersion in their presence across sectors in the early 2000s, we are able to observe growth effects in a large sample of sectors.

Firms in Egypt operate in 320 non-farm, non-government 4-digit ISIC Rev.4 sectors. As Table 1 illustrates, at least one politically connected firm was present in 155 of them (see Tables A1 and A4 in the Online Appendix).[14] Some of the 155 sectors were more mature and traditional and others were more modern (e.g., manufacturing of batteries or computer programming services). Within manufacturing, where 40% of the connected firms of any type operate, they are present in 46% of the 4-digit industries (69 out of 149).[15]

[13] The former Minister also faced accusations of subsidizing specific export industries while holding shares in companies operating in these industries and of an illegal selling of steel-manufacturing licenses while in office.

[14] We exclude the following sectors, where firm dynamics in these sectors are driven by the government and not the private sector in Egypt: public administration, education, health, arts (4-digit ISIC Rev. 4 codes larger than 8400).

[15] Sectors vary also with respect to the number of politically connected firms. Fifty-seven sectors have exactly one firm with a politically connected owner, while one sector has 29 firms with connected owners; 60 sectors have exactly one politically connected firm of any type, while one sector has 30.

Table 1 Type of political connection across firms and by 4-digit sectors

Type of PC firm	Number of PC firms of that type	Number of 4-digit sectors (out of 320 ISIC Rev.4) with at least one PC firm of that type
Any type of politically connected firm	385	155
Politically connected owner	334	142
Politically connected board member but not owner	51	13

The first analytical exercises below investigate whether previously unconnected sectors that experienced entry by connected firms suffered from slower long-term employment and labor productivity growth, and exhibited firm distributions more skewed toward small firms over the periods 1996–2006 and 1996–2012. They require data on which sectors were unconnected prior to the late 1990s and, of these, which experienced entry by a connected establishment. The entry year is obtained from the date of incorporation, which we observe for each establishment using stock market and on-line financial information.[16] This allows us to trace back the operation of each politically connected establishment over time. Many of the connected establishments that entered new activities were in fact subsidiaries of larger conglomerates owned by politically connected businessmen.

Our data do not capture two types of crony entry and exit, but these are likely to be infrequent and to generate a bias against finding an influence of connected firms on sector growth. First, we cannot identify connected establishments that might have existed during the 1990s or early 2000s, but then exited the market prior to the end of the Mubarak regime in 2011. There are likely to be few of these, if any, however.[17] The presence of such connected firms in the sample, if there are any at all, would dampen the estimated negative effect of connected firms on unconnected firms in their sectors. Unconnected firms in sectors where connected firms exited "early" would had less exposure to the negative effects of connected firms than unconnected firms in sectors where they did not exit. This yields a bias against finding a negative effect of connected firms on sector growth. Second, there are likely to be relatively few connected firms that emerged prior to the period we examine, given the unprecedented number and scope of new establishments owned by politically connected businessmen in the late 1990s and early 2000s (see section 3). If this assumption does not hold, and connected firms were in fact active in sectors that we assume were unconnected, the analyses are again biased *against* finding an effect of crony entry, since these sectors would be spuriously categorized as "unconnected" in the analysis, reducing the estimated differences between connected and unconnected sectors.

[16] These sources give the date of incorporation both for the mother company and for subsidiaries (establishments), as well as the years in which changes in firms' ownership structures took place (crony businessmen acquiring or selling shares in companies) and mergers and acquisitions of previously unconnected firms by connected firms. All of these allow us to capture the entry of politically connected firms into new sectors.

[17] Tracking the firms of the connected businessmen over time, we found no cases of the exit of a crony firm between 1996 and 2011 (crony banks exited in the late 1980s, before our period of interest).

In sectors with several crony firms, we cannot preclude the possibility of inter-crony *competition*, which could have spurred productivity increases. This would also create a bias against finding a negative effect of cronyism on growth. In fact, however, inter-crony *collusion* appears to have been more likely, facilitated by the web of intertwined ownership structures and co-investments that crony firms exhibit. For instance, five (ten) businessmen together controlled stakes directly or indirectly in 192 (268) firms. In addition, 85 firms (22%) owned by a connected businessman received significant investments from private equity funds controlled by *other* politically connected investors.

5.2 Measuring the aggregate impact of cronyism

We are interested in answering a question that has eluded the literature: does the presence of connected firms suppress sector growth? Ideally, we would examine total factor productivity growth in sectors, but the data do not allow for this. We rely on commonly-used proxies, specifically employment growth across all sectors and labor productivity growth in manufacturing sectors. Over a sufficiently long period – the census data stretch over 16 years – total factor productivity and employment growth should be highly correlated.[18] Census data have the advantage that they are available for establishments in all economic sectors, but they are insufficient to compute labor productivity. However, for a smaller sample of manufacturing sectors, we observe both labor productivity and wage growth and can directly show that these decline after crony entry, consistent with the intuition that productivity growth slows when leading firms enjoy significant cost advantages over trailing firms.

To analyze sectoral effects on employment growth, we match the list of politically connected establishments to their corresponding 4-digit sectors in the establishment census from the department of statistics in Egypt (CAPMAS). The census data include all non-farm economic establishments with a fixed location, more than 2 million establishments in each year. We then compare detailed sector-level performance across the 282 non-farm, non-government (ISIC Rev. 3.1) 4-digit sectors before and after the entry of crony firms into previously unconnected sectors. Note that the 1996 establishment census uses an ISIC Rev. 3.1. sector classification which yields fewer 4-digit sectors than the 320 non-farm, non-government ISIC Rev. 4 sector classification used in 2006 and 2012. Merging the 4-digit ISIC 3.1 and ISIC 4 sector classifications therefore resulted in a total of merged 282 ISIC Rev. 3.1 sectors in Egypt. The descriptive statistics for the 10- and 16-year employment growth rates and the control variables (average log-employment and age in 1996) are provided in Table A.4 in the Online Appendix for each of the different groups of 4-digit sectors.

By combining the 1996, 2006, and 2012 censuses, we can analyze the long-run reaction of employment growth to crony entry by observing change in employment of the 282 sectors over long (10 and 16 year) time periods. The two earlier censuses are right before and several years after the historical episode in the late 1990s, when

[18] Over a sufficiently long time period, sectors with higher productivity growth exhibit higher marginal products of labor and thus greater employment growth (see the reviews for empirical evidence from developing countries in Herrendorf et al. 2014; World Bank 2014; Vivarelli 2012).

connected firms significantly expanded their economic activities into numerous new economic activities. The 2012 census is at the end of the Mubarak regime and allows us to measure the long-term growth impact of crony firm entry, up to 16 years after entry, when sector market structures settled into a new equilibrium.

Egyptian census data do not allow us to examine productivity effects of entry. However, UNIDO (*INSTAT4)* provides time series data aggregated at the 4-digit sector level for manufacturing sectors in more than 100 developing countries on employment, value added, and wages between 1996 and 2012. INSTAT4 includes 4-digit sector data for Egypt until 2006 which we use to measure the growth of labor productivity and wages in 4-digit manufacturing sectors in Egypt between 1997 and 2006, comparing those sectors that experienced entry by connected firms and those that did not.

5.3 Assessing the privileges of connected firms

Our main novel result is that newly connected sectors exhibit slower subsequent employment and labor productivity growth than never-connected sectors. However, we also document the underlying mechanisms that are consistent with a causal interpretation for this finding. One such mechanism is that, because of their significant privileges, connected firms enjoy better performance than unconnected firms. Firms are anonymous in census data. Hence, to establish performance differences between-firms, within-sectors, we rely on the Orbis database, which contains firm names and data for all establishments with at least 20 employees between 2003 and 2011. Orbis has employment data for over 20,000 establishments, operating revenues for about 700 large establishments, and profits for about 400 large establishments.[19] It has primarily information for large firms and so cannot be used to make sector comparisons. After matching all connected firms to firms in this database, we then compare the evolution of employment, revenues, and profits of connected firms with those unconnected firms that are in Orbis.

A second key mechanism is that connected firms enjoy privileged access to state resources and exemptions from state regulatory requirements. There are no data on firm-specific exposure to government policies. However, we can measure whether the narrow sectors to which connected firms belong enjoyed greater privileges than those narrow sectors without connected firms. World Bank data (WITS) provide detailed product-specific information on non-tariff barriers to trade (NTMs); the UN reports data on the energy intensities of manufacturing industries – the industries that would benefit most from the massive energy subsidies available in Egypt during this period. The WITS and UN data cover all sectors and we simply match these data to the data on the sectoral intensity of cronyism to see if detailed products or sectors with more politically connected firms benefit from more NTMs and are more energy-intensive (receive more energy subsidies).

[19] All politically connected firms had at least 20 employees in 2006. Overall, there were in total only 18,640 establishments with more than 20 employees according to the 2006 establishment census; 69% of all establishments in the census had fewer than 5 employees.

6 Effects of connectedness on economic growth

Unlike previous research, we have data on many politically connected firms distributed across many narrowly-defined sectors. Moreover, many of these sectors experienced the entry of politically connected firms for the first time at the beginning of our sample period. This allows us to compare sectors that experienced crony entry and those that did not with respect to long-term employment growth, labor productivity growth and changes in the distribution of firm sizes.[20]

6.1 Identification strategy

Our sample of connected sectors is large enough to allow for sectors that never experienced crony entry to be compared to those that did. This allows us to take steps towards causal inference that have not been possible in previous research, although we still depend on supporting evidence to make the case that unobserved sector characteristics are unlikely to account for both crony entry and the slower growth of sectors entered by cronies.

In 1996, 114 non-agricultural, non-government 4-digit sectors did not contain any politically connected firm (recalling our earlier argument that it is unlikely that connected firms were in fact present, but exited before 2006). Between 1997 and 2005, 27 (32) firms with a politically connected owner (or board member) entered 21 (23) of these 114 unconnected 4-digit sectors (see Table A4 in the Online Appendix).[21] The previously unconnected sectors they entered were in services, manufacturing, utilities, and mining. The remaining 93 (91) non-agricultural, non-government 4-digit sectors that were unconnected in 1996 remained so throughout the subsequent fifteen-year period until the end of the Mubarak regime.

We compare the growth in employment in initially unconnected 4-digit sectors that crony firms entered relative to employment growth in unconnected sectors that they did not enter, holding constant fixed broad sector characteristics. For the subset of manufacturing sectors, we are also able to compare labor productivity growth between the two groups of sectors.

While an improvement on what has been possible in prior research, this estimation offers only partial support for causal inference because it does not exclude the possibility that sectors that experienced crony entry would have grown more slowly, anyway. For example, if cronies purchased state-owned enterprises that exhibited overemployment, they might have driven down employment in newly privatized firms

[20] Most of the prior research cited above, examining the performance of connected firms, has relied, as we do, on a combination of theory and empirical correlations to make causal inferences about the effects of political connections. Some prior research (e.g., Fisman) has exploited exogenous variations in political connectedness, such as announcements of leader illness, to make inferences about the causal effects of political connectedness on connected firms' *value*. The longer time horizons needed to estimate impacts on aggregate growth make it difficult to rely on the methodologies in this latter research, however. In particular, the power of event studies is greatest when examining the effects of exogenous shocks on outcomes reported with high frequency. Changes in aggregate growth, though, can only be meaningfully measured over longer time periods.

[21] Most crony firm entry took place in the beginning of this period, leaving sufficient time for the impact of crony firm entry on sector market structures to materialize. In fact, 29 (24) out of the 35 crony firms entered previously unconnected sectors before 2001 (1999). Moreover, the results below are robust if we remove the five cases in which crony firms entered into unconnected sectors after 2001 from the estimation (results available from the authors).

relative to other firms in their sectors. However, we present several pieces of evidence suggesting that it is unlikely that unobserved factors such as privatization account for both the slower employment growth of connected sectors and crony entry into those sectors.

First, we also control for two 4-digit sector characteristics, average firm size and age (maturity), as well as for unobserved sector differences at the one-digit level that might otherwise account for both crony entry and performance differences.[22] Our identifying assumption is that these variables are sufficient to account for factors that might simultaneously influence cross-sector differences in employment growth and attractiveness to connected firms.

Second, we directly address whether the sectors that connected firms entered might have grown more slowly even in the absence of crony entry. First, crony entry was often associated with privileged investment in new areas of economic activity, such as previously undeveloped tourist areas or multinational entry into Egypt. Privatization was not a characteristic of sectors entered by cronies. Second, sectors with more promising growth opportunities typically exhibit a larger share of younger firms. Connected sectors in our sample *also* had a larger initial share of young firms. Third, we identify sectors in other countries that, in Egypt, experienced or did not experience crony entry. Those sectors identified as having experienced crony entry inside Egypt grew *more* rapidly in countries outside of Egypt than the sectors identified as having remained unconnected inside Egypt. We cannot exclude the possibility that a sector-specific shock occurred in Egypt, but not in other countries, that spuriously encouraged crony entry and suppressed sector growth. However, our argument suggests the most plausible sector-specific shock, crony firm entry, coincided with policies friendly to cronies in these sectors, in Egypt but not elsewhere, causing the corresponding negative effects on sector performance.

Third, we find additional empirical regularities that should be present if the entry of connected firms reduces aggregate growth. One, an implication of the argument in Aghion et al. (2001), is that the presence of firms with a large cost advantage over other firms in a sector should cause the distribution of firm sizes (number of workers) in the sector to be more skewed toward smaller firms. This is the case. The fact that employment in sectors that experienced crony entry was skewed towards a few large firms with many small firms is the opposite of what one would expect if cronies simply reduced excessive labor following the privatization of inefficient firms. Second, connected firms in Egypt in fact enjoyed ample policy privileges, they were more profitable, and their privileges can account for their greater profitability. This is inconsistent with the explanation that crony-driven efficiency measures in privatized firms can account for our results. Finally, we show that, as expected over the long-term, the adverse impact of crony firm entry on employment growth is accompanied by a decline in productivity growth in these sectors relative to manufacturing sectors that remained unconnected. Each of these regularities could be the spurious product of unobserved shocks. However, the breadth of the evidence argues against this interpretation.

[22] The 23 4-digit sectors within which we observe the entry of a politically connected firm is a large number in the context of the problem we are analyzing, but they are too few to also control for the unobserved sector characteristics of the 49 2-digit sectors to which the 23 sectors belong. In particular, at the 2-digit level, in some cases all of the 4-digit sectors are connected and therefore drop out when controlling for 2-digit sector dummies.

6.2 Estimation

The following specification tests whether employment declined over the 10- and 16-year periods from 1996 to 2006 and 1996–2012 in sectors that were initially unconnected and subsequently experienced entry by crony firms, relative to sectors that remained unconnected. In the specification, $\Delta y_{s,\ t-1996}$ measures employment growth of the 4-digit sector s between 1996 and 2006 or 2012 ($t = 2006\ or\ 2012$), respectively, *PCEntry* indicates the entry of politically connected firms between 1997 and 2005, and *NPC* are sectors without crony firms before 1997. X is a matrix of control variables (employment and age), and S a matrix of sector dummies.

$$\begin{aligned}\Delta y_{s,t-1996} &= \beta_E PCEntry_{s,1997-2005} + \beta_N NPC_{s,1996} \\ &+ \beta_{EN}\left(PCEntry_{s,1997-2005} * NPC_{s,1996}\right) \\ &+ \beta_X X_{s,1996} + S + \varepsilon_{s,t}\end{aligned} \tag{1}$$

The key variable of interest is the term interacting entry by the politically connected firm with the dummy variable indicating whether the sector was previously unconnected. Our central hypothesis is that cronyism reduces aggregate growth by discouraging investments of their competitors. If it is correct, the coefficient β_{EN} should be negative, indicating that the growth of the 23 previously unconnected sectors entered by firms owned by politically connected businessmen was slower than the growth of the 91 sectors that remained unconnected after 1996, controlling for sector-specific characteristics. The aggregate effects of entry by connected firms on sector employment growth can only be negative, therefore, if their entry has a sufficiently adverse impact on the growth of the other, non-connected firms in the same sector.[23]

Consistent with the hypothesis, we find that long-term employment growth declined after the entry of crony firms into previously unconnected sectors, as indicated by the interaction terms in Table 2. The economic impact is also large. The main specification for the 10-year period from 1996 to 2006 (columns 3 and 6) controls for sector fixed effects, average firm age, and average firm size in a 4-digit sector. The estimation implies a 1.3 percentage points reduction in sector employment growth per year (15–19 percentage points for the full period) due to the entry of, and corresponding protection enjoyed by, connected firms.

Table 2 presents 12 different specifications, with different control variables, definitions of cronyism and growth periods. The effect is robust in 10 of them, including the four with all control variables. These variables, firm age and size, are meaningful, since

[23] In contrast, the signs of the other coefficients are ambiguous since the theory does not speak to growth differences between already-connected sectors and either already-connected sectors that experienced additional crony entry (β_E), or unconnected sectors that did not experience crony entry (β_N). For example, the effects of crony entry into already-connected sectors are ambiguous because these sectors may have already experienced the distortions associated with crony privilege.

Table 2 Employment growth declines after politically connected firms enter initially unconnected sectors

	Employment growth 1996–2006						Employment growth 1996–2012					
	Owner			Broad			Owner			Broad		
Entry PC	5.07	10.2	10.3	3.18	7.09	7.10	.965	14.3	14.5	−2.43	7.17	7.29
	(0.84)	(1.19)	(1.24)	(0.44)	(0.98)	(1.01)	(0.18)	(1.06)	(1.12)	(−0.42)	(0.61)	(0.64)
Not connected before 1997	26.4	15.7	15.1	14.5	−5.23	−6.95	41.2	31.5	30.5	19.5	−10.2	−13.1
	(1.22)	(0.79)	(0.82)	(0.44)	(−0.34)	(−0.46)	(0.81)	(0.68)	(0.68)	(0.28)	(−0.26)	(−0.35)
(Entry PC) *	−25.5**	−30.9**	−18.7**	−23.1	−29.9**	−14.7*	−44.7**	−66.3**	−44.7**	−39.2	−62.3**	−35.3**
(Not connected before 1997)	(−3.01)	(−3.22)	(−3.47)	(−1.25)	(−2.36)	(−1.77)	(−2.37)	(−3.88)	(−4.93)	(−1.08)	(−2.53)	(−2.78)
ln(empl)			−.382**			−.376**			−.684			−.673
			(−2.16)			(−2.31)			(−1.58)			(−1.64)
Age		11.9	12.3		12.4	12.8		29.0	30.0		29.6	30.6
		(1.49)	(1.53)		(1.57)	(1.60)		(1.49)	(1.51)		(1.52)	(1.54)
No. of sectors	225	224	224	225	224	224	219	219	219	219	219	219
R-squared	0.021	0.142	0.159	0.018	0.146	0.161	0.019	0.187	0.201	0.016	0.188	0.201
Sector fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Establishment census data, including all non-agriculture, non-government sectors in 1996,2006, and 2012 and sample of politically connected firms

PC indicates the number of politically connected firms that entered each 4-digit sector. The two different types of connections (ordered by their restrictiveness) are defined in Table 1. The average number of employees (size) and the average establishment age are computed at the 4-digit sector level in 1996. All 4-digit sector level regressions include 1-digit sector dummies. Standard errors are clustered at the sector level. *, ** denote significance at the 10%, 5% significance level, respectively, t-statistics are reported in parentheses

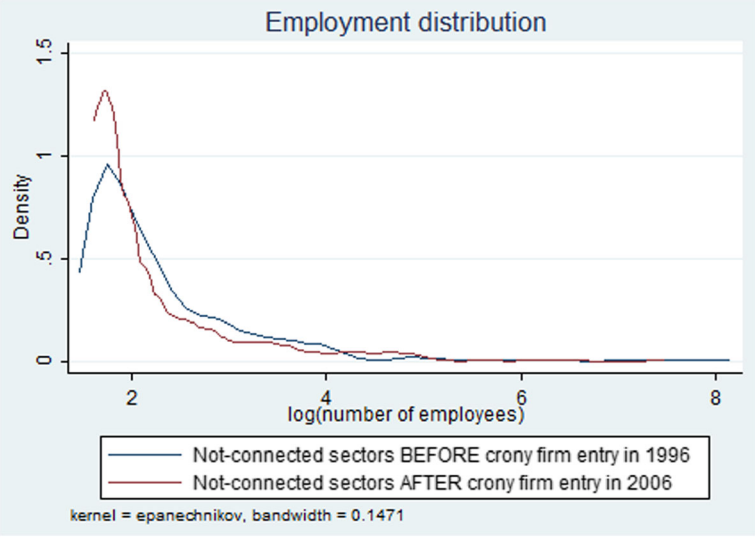
the *R*-squared changes significantly with their inclusion. The interaction is also statistically significant in all different specifications using the narrower definition of entry of firms owned by connected businessmen, whether or not we control for average firm age and size in a 4-digit sector. For the broader definition of politically connected firms, the adverse impact of crony firm entry on sector employment growth is statistically significant once we control for average firm age in a 4-digit sector.

The interaction coefficients in Table 2 could be subject to two sources of bias that make it *less* likely to find a negative relationship between crony entry and sector growth. First, by construction, entry by any firms, including cronies, mechanically increases reported employment growth. Second, crony firms are significantly larger than non-crony firms. Hence, when we control for average firm size in our main specifications, we spuriously reduce the explanatory power of the interaction term.

The 16-year period from 1996 to 2012 reveals a comparably large adverse impact of crony firm entry on sector employment growth. The main specifications (columns 9 and 12), including all control variables, imply a 1.2 percentage points reduction in sector employment growth per year (35–45 pp. for the full period) due to the entry (and protection) of connected firms over this 16-year period. The effect is again robust to variations in the control variables.

Absent data on wages and output for the firms represented in Table 2, we cannot directly demonstrate that lower employment growth was associated with lower productivity growth. It is, therefore, possible that long-term employment growth declined in connected sectors even as productivity grew. There are two ways in which the alternative interpretation might emerge. First, connected firms might have faced lower costs of financing due to their political connections. This would have reduced their cost of capital relative to unconnected firms, allowing them to substitute capital for labor and, at the same time, boost labor productivity. Second, connected individuals might have systematically purchased inefficiently managed firms that exhibited significant excess employment. After acquiring poorly managed firms, they shed excess workers, accounting for the decline in employment growth in their respective sectors. Neither of these offers a plausible explanation for the lower employment growth in non-manufacturing sectors, however.

First, higher capital intensity after crony firm entry might have led to a one-time drop in employment (a level effect). However, since capital and labor are not perfect substitutes, after 10 to 16 years, the higher labor productivity induced by greater capital intensity should have increased demand for labor and, thus, employment growth. This did not happen. Second, connected firms might have increased productivity in a sector, while reducing employment growth, by displacing low-productivity, labor-intensive small firms. However, if this had occurred, we would have observed a decline in the employment concentrated in small firms. Below, however, we explicitly look at the distribution of employment within sectors (Fig. 1). It became even more right-skewed, towards small firms, after sectors experienced crony firm entry. Nor did connected firms reduce employment growth by purchasing over-staffed state-owned firms, reducing labor and increasing productivity. All 32 politically connected firms that entered the 23 previously unconnected sectors did so by the creation of new establishments—none of these firms entered through privatizations.



Source: Establishment census data including over 2 million firms in all non-agriculture, non-government sectors in 1996 and 2006 and sample of politically connected firms.
Note: The graph uses the broad measure of any type of politically connected firm. The graph for politically connected owners yields very similar employment distributions.

Fig. 1 Employment distribution before and after the entry of crony firms into previously unconnected sectors

6.3 Manufacturing sectors that experienced crony entry exhibited slower growth in labor productivity

Data from another source, UNIDO (*INSTAT4*), allow us to show directly that labor productivity fell in the manufacturing sectors that cronies entered. Using these data, measures of labor productivity and wage growth between 1996 and 2006 can be constructed for 100 and 107 4-digit manufacturing sectors in Egypt (respectively). The source also has data on employment, allowing us to replicate most of the specifications in Table 2, substituting productivity and wage growth for employment growth.

Table 3 displays the results, demonstrating that connected firm entry into previously unconnected 4-digit manufacturing sectors is associated with significantly slower productivity and total wage growth relative to sectors that remained unconnected. Labor productivity growth was approximately one percentage point slower (.994 to 1.21 percentage points slower) over the entire period 1996–2006, while total wage growth was approximately 12 percentage points slower (11.3 to 12.8 percentage points slower).

The manufacturing sectors in Table 3 are only a subset of the sectors represented in Table 2, raising the question of whether the employment growth results in Table 2 persist for this subsample. In fact, whether using the UNIDO data or the Egyptian census data, employment growth was no different in connected and unconnected manufacturing sectors. Instead, from the UNIDO data we learn that in manufacturing sectors, crony-driven labor demand adjustments in manufacturing occurred through prices (wages), not through quantity reductions (employment). This is consistent with our argument that unconnected firms in connected sectors, unable to compete with the

Table 3 Labor productivity growth declines after politically connected firms enter initially unconnected manufacturing sectors

	Labor productivity growth 1996–2006				Wage growth 1996–2006			
	Owner		Broad		Owner		Broad	
Entry PC	−.046	−.108**	−.052	−.115**	−.195	−.370	−.211	−.413
	(−0.44)	(−3.00)	(−0.77)	(−2.88)	(−0.271)	(−0.41)	(−0.33)	(−0.48)
Not connected before 1997	2.18**	2.43**	2.66**	2.93**	25.5	26.2	28.1	28.9
	(4.46)	(6.81)	(9.49)	(9.05)	(1.33)	(1.29)	(1.60)	(1.56)
(Entry PC) *	−.778**	−.994**	−.979**	−1.21**	−10.8**	−11.3**	−12.1**	−12.8**
(Not connected before 1997)	(−2.95)	(−4.70)	(−2.02)	(−2.91)	(−2.46)	(−2.11)	(−3.70)	(−3.03)
ln(empl) 1997		.397		.128		.857		1.03
		(1.20)		(1.36)		(0.42)		(0.52)
No. of sectors	100	100	100	100	107	107	107	107
R-squared	0.044	0.058	0.058	0.074	0.029	0.029	0.031	0.032
Sector fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

UNIDO (INSTAT4) and sample of politically connected firms in Egypt

All 4-digit sector level regressions include 1-digit sector dummies and the initial size of sectors in 1996, corresponding to Table 2. Standard errors are clustered at the sector level; t-statistics are reported in parentheses. *, ** denote that the difference in growth rates between the treat and control group sectors is significance at the 10%, 5% significance level

advantages of connected firms, experienced slower growth of labor productivity relative to connected firms, leading to a corresponding reduction in wage growth across the sector. Table 3 documents precisely this mechanism: both wage and labor productivity growth were lower in connected sectors. The effect is robust to variations in the control variables.

6.4 Did connected individuals enter sectors that were inherently slow-growing?

Connected firms do not enter sectors randomly and we cannot entirely discount the role of unobservable factors that might have driven a spurious association between crony entry and sector growth. This section presents substantial indirect evidence that is inconsistent with this possibility, however, and shows that connected firms were unlikely to have entered sectors that were going to grow more slowly, anyway.

Observers argue that several sectors entered by connected firms, such as tourism and specific manufacturing sectors, exhibited high growth potential (see Table A4 in the Online Appendix and Skafianis 2004; Roll 2010; Loewe 2013). More quantitative indicators are also inconsistent with the proposition that connected firms entered sectors that would have grown more slowly independent of crony entry. Slower growing sectors are typically more mature and thus should have a significantly higher fraction of older firms than sectors with higher growth potential. However, cronies did not enter more mature sectors. The share of young establishments in the unconnected sectors that cronies entered after 1996 was higher than in the unconnected sectors that cronies did

not enter. Fifty percent of the establishments in unconnected sectors entered by connected firms were less than 10 years old and 28% were less than five years old. In the unconnected sectors that remained unconnected, 44% of establishments were less than 10 years old and 24% less than five years old

International evidence also supports the claim that connected firms did not enter slower-growing sectors. The relative growth of sectors in countries like Egypt should approximate their relative growth in Egypt, excluding the effects of cronyism. Hence, if Egyptian cronies had entered sectors with intrinsically low growth potential, then these same sectors, in other countries, should also have grown more slowly. Table 4 shows that, if anything, the opposite is true in manufacturing: employment, productivity, and wage growth tended, in fact, to be higher among the different country groups for the treatment group sectors. UNIDO (*INSTAT4)*, the basis for the analysis in Table 3, provides time series data for 4-digit manufacturing sectors for more than 100 developing countries on employment, value added, and wages at the 4-digit sector level for manufacturing sectors between 1996 and 2012. This allows us to calculate the growth rate over these periods for employment, labor productivity, and wages for the "treatment" group sectors (the 4-digit manufacturing sectors that crony firms in Egypt entered after 1996 that were previously unconnected) and the "control" group sectors (4-digit manufacturing sectors that remained unconnected in Egypt) in other countries.

Table 4 reports the comparisons between the treatment and control group sectors among all countries with available data: all developing countries from the Middle East and North Africa (MENA), and all Eastern European and Central Asian (ECA) countries. The upper panel of Table 4 indicates that from 1996 to 2006 there was no significant growth difference between the treatment and control group sectors in other countries. Over the long-term, from 1996 to 2012, the lower panel demonstrates that the unconnected sectors that experienced crony entry in Egypt saw faster employment and wage growth in other countries than those that did not experience crony entry; labor productivity growth was the same.

The UNIDO data do not include services. However, data from neighboring Jordan are available for most 4-digit manufacturing and service sectors between 1996 and 2012. Results displayed in Table 5 indicate, once again, that those sectors that, in Egypt, experienced entry by connected firms, exhibited *greater* employment and investment growth in Jordan from 1996 to 2006 and 1996–2012, respectively. They also exhibited no significant differences with the control group sectors in Jordan with respect to investment, value-added growth or wages.

The evidence supports our identifying assumption in Table 2, that crony firms did not enter new sectors with a lower growth potential. On the contrary, connected firms in Egypt appear to have entered sectors with somewhat *greater* growth potential. Despite that, these sectors experienced slower growth.

For several reasons, then, we might have expected growth in connected sectors to have been higher than in unconnected sectors, and nevertheless it was lower. Sectors that were connected in Egypt grew more rapidly in other countries; cronies took advantage of new areas of economic activity opened by government (e.g., new tourist areas or sectors where multinational entry was newly authorized); and cronies entered sectors with younger firms, on average. Our estimates of the negative effects of cronyism on growth may therefore constitute a lower bound of those effects.

Table 4 Employment and productivity growth rates (in percentage points) of treatment and control group manufacturing sectors in all other countries from 1996 to 2006 and 1996–2012

	Employment growth 1996–2006			Labor productivity growth 1996–2006			Wage growth 1996–2006		
	All Countries	MENA	ECA	All Countries	MENA	ECA	All Countries	MENA	ECA
Difference crony versus non-crony sectors, 1996–2006	.771	−.229	.394	−.184	.095	1.18*	−.252	−.484	−1.62
	(1.17)	(−0.80)	(0.81)	(−1.34)	(0.22)	(1.75)	(−0.46)	(−1.06)	(−0.71)
Sector level control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Employment growth 1996–2012			Labor productivity growth 1996–2012			Wage growth 1996–2012		
	All Countries	MENA	ECA	All Countries	MENA	ECA	All Countries	MENA	ECA
Difference crony versus non-crony sectors, 1996–2012	1.53**	.777**	2.47	.736	1.15	−.846	5.96**	1.71**	8.21**
	(2.35)	(2.59)	(1.36)	(0.53)	(0.70)	(−0.38)	(2.98)	(9.77)	(1.97)
Sector level control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

UNIDO (INSTAT4) and sample of politically connected firms in Egypt. We use the broad measure of political connections (see Table 1). The 4-digit new (previously unconnected) manufacturing sectors entered by crony firms after 1996 are listed in Table A4. "All Countries" includes all 104 countries with available data (excluding Egypt), "MENA" all developing countries in the Middle East and North Africa (excluding Egypt), "ECA" all countries in Eastern Europe and Central Asia. All 4-digit sector level regressions include 1-digit sector dummies and the initial size of sectors in 1996, corresponding to Table 2. Standard errors are clustered at the sector level; t-statistics are reported in parentheses. *, ** denote that the difference in growth rates between the treat and control group sectors is significance at the 10%, 5% significance level

Table 5 Average annual growth rates (in percentage points) of treatment and control group manufacturing and service sectors in Jordan from 1996 to 2006

	Employment growth	Investment growth	Value added growth	Wage growth
Difference crony versus non-crony sectors, 1996–2006	1.42**	9.20	−2.84	−1.70
	(2.12)	(0.72)	(−0.50)	(−0.32)
Sector level control variables	Yes	Yes	Yes	Yes
Sector fixed effects	Yes	Yes	Yes	Yes
Difference crony versus non-crony sectors, 1996–2012		21.0	−3.44	−1.07
		(1.06)	(−0.64)	(−0.18)
Sector level control variables		Yes	Yes	Yes
Sector fixed effects		Yes	Yes	Yes

Department of Statistics Jordan and sample of politically connected firms in Egypt. We use the broad measure of political connections (see Table 1). We observe 13 new manufacturing and non-government service sectors entered by crony firms after 1996 and 44 sectors that remained unconnected. The 4-digit new (previously unconnected) sectors entered by crony firms after 1996 are listed in Table A4. All 4-digit sector level regressions include 1-digit sector dummies and average initial sector sizes as in Table 2. Standard errors are clustered at the sector level; t-statistics are reported in parentheses. *, ** denote that the difference in annual growth rates between the treat and control group sectors is significance at the 10%, 5% significance level

The following sections present further evidence supporting the mechanisms underlying negative crony effects on growth. Among these, the size distribution of firms shifted downwards and crony firm entry was associated with policy privileges that suppressed the growth opportunities of the other firms competing in these sectors. In particular, connected firms enjoyed state-granted privileges that gave them cost advantages over other firms; they were more profitable; and their profits can be explained by their privileges.

7 Firm distribution after crony entry

The Aghion et al. (2001) analysis predicts that in sectors in which a leading firm has a large cost advantage, the distribution of firm sizes should be reduced. If the benefits of cronyism lead to large cost advantages for connected firms compared to unconnected firms, sectors dominated by connected should exhibit a large crony market leader and many small and less productive firms that use vintage technologies to serve local market niches. In fact, although the 385 politically connected firms enjoy privileges that might encourage them to grow faster, they only account for about 5 % of aggregate employment in Egypt. Employment is instead concentrated in (old) micro and small firms: establishment census data show that firms with fewer than ten employees account for 72% of aggregate employment (Hussain and Schiffbauer 2015; World Bank 2014). In addition, these firms often operate in the informal sector and typically are less productive (World Bank 2014).

We can also compare the distribution of employment in initially unconnected sectors before and after the entry of crony firms (2006 versus 1996).[24] Figure 1 displays the results of this comparison. The distribution of employment became more skewed toward micro and small firms after the entry of crony firms; the difference in the distribution is statistically significant (Kolmogorov-Smirnov test).[25] We do not observe the change in employment distribution of firms in sectors that remained unconnected, so we cannot exclude the possibility that the shift downwards in the size distribution of firms might have been a general phenomenon across all sectors. However, Fig. 1 is consistent with the mechanisms linking crony entry to slower growth.

8 The cost advantages of crony firms

If crony entry slows employment growth because of the cost advantages of connected relative to unconnected firms, then we should observe that connected firms in fact enjoyed privileges that gave them a competitive advantage over other firms in their sectors; that they were more profitable; and that their privileges account for this profitability. We explore each of these in turn. In the case of privileges, the focus of this section, we demonstrate that crony sectors enjoyed greater import protection and energy subsidies.

8.1 Political connections and non-tariff trade barriers

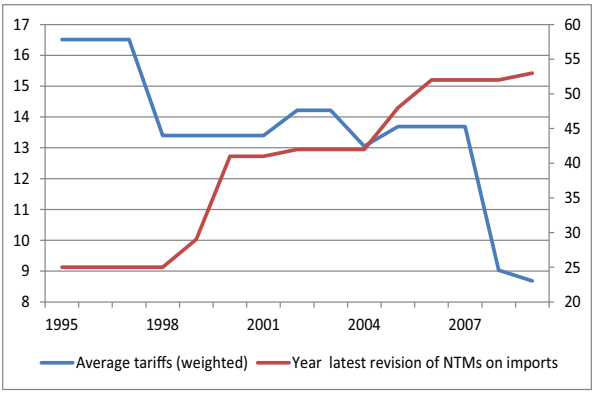
Although tariffs fell in Egypt at the end of the 1990s, the use of non-tariff technical import barriers (NTMs) increased.[26] NTMs can be tailored to individual products: connected firms in a 4-digit sector, but not unconnected firms, can benefit from them.

Using data from a World Bank database (World Integrated Trade Solution, or WITS, Malouche et al. 2013), Fig. 2 illustrates the decline in average weighted tariffs from about 16.5% in 1995 to 8.7% in 2009 – but also a steady and offsetting increase in NTMs. NTMs primarily included barriers to imports such as exclusive license requirements, rules of origin, or quality controls. As a result, Egypt had one of the highest NTM frequencies in the world in 2010 (Malouche et al. 2013). Figure 2 perfectly illustrates the growth of cronyism: government policies that affect the prices confronting all firms (tariffs) are replaced by policies that affect more narrowly targeted enterprises.

[24] We cannot re-construct the figure for 1996 and 2012 since we only have access to the complete establishment census data in 1996 and 2006 but not in 2012. The complete census is needed to plot the distribution of employment across all establishments in Egypt. For 2012, we only have access to the total and average employment across firms by 4-digit sectors.

[25] We also find that the employment distribution in connected sectors is more right-skewed and exhibits a higher coefficient of variation (fatter tails) in employment. Likewise, the skewness and coefficient of variation in employment increased in crony sectors but declined in sectors that remained unconnected between 1996 and 2006 (we were able to obtain skewness statistics for always-unconnected firms, but not their full distribution). The results are available from the authors upon request.

[26] The World Bank database on NTMs provides either the year when an NTM was introduced or the latest year in which it was substantially revised. It does not distinguish the two.



Source: WITS. Rate reflects most-favored nation tariffs. The NTMs data provides either the year when an NTM has been introduced or the latest year in which it is has been substantially revised.

Fig. 2 The evolution of average (weighted) tariffs and the number of NTMs on imports since 1995

Of the 53 different NTMs in place in Egypt in 2009, almost half (24) were introduced or significantly amended around 2000 and 21% between 2005 and 2009, consistent with the earlier arguments that government privileges followed the entry of connected firms. The first episode coincides with the period when several prominent businessmen headed directorates for economics and business in the policy committee of the government party (Demmelhuber and Roll 2007; Roll 2010). NTMs during the second episode were issued by the Ministry of Industry and Trade, directed at the time by a prominent businessman, who faced charges of corruption and illicit profiteering through the accounts of a Cypress-based fund immediately after the regime change in 2011.

To test if these NTMs disproportionally benefitted politically connected firms, we need to match products protected by NTMs with products sold by firms. The WITS (World Integrated Trade Solution) database records NTMs on products at the 6-digit level, indicative of how finely NTMs can be targeted, and correspond to 147 manufacturing and mining 4-digit products (ISIC classification). We map the 6-digit NTM data onto the 4-digit establishment census data we use in Table 2. Among the politically connected firms (broadly-defined) in our larger sample, 81% sell products that are subject to technical import barriers.[27]

Most NTMs in Egypt are "Class B": license or registration requirements for importers, packaging requirements, regulations on production or distribution processes, traceability, and product-quality requirements.[28] These restrictions are imposed on 65%

[27] We convert the NTM data from the 6-digit (HS Rev. 2002) product classification to the 4-digit product group / industry (ISIC Rev. 4 classification) by using concordance tables from HS Rev. 2002 to ISIC Rev. 3 to ISIC Rev.3.1 to ISIC Rev. 4, respectively. Several firms operate in more than one 4-digit product group so that in total we have 230 product-firm observations in manufacturing or mining. Three politically connected firms are in two 4-digit ISIC Rev. 4 product groups, *Casting of non-ferrous metals* and *Forging, pressing, stamping and roll-forming of metal*, which we had to drop from the NTM analysis since they had no equivalent HS (Rev. 2002) product code.

[28] Some products in Egypt are also subject to sanitary measures (NTM Class A), mostly in the food sector, or price controls (NTM Class P), typically in addition to technical import barriers (NTM Class B).

(96 out of 147) of the 4-digit manufacturing products. On average, these 96 products confront 3–4 different Class B restrictions.[29]

Table 6 demonstrates in several ways that manufacturing and mining products sold by politically connected firms are more likely to be protected from import competition through NTMs. The first two columns indicate the percentage of firms with political connections that sell products protected by NTMs.[30] The third column looks at the percentage of all unconnected firms that sell products protected by NTMs. A larger percentage of connected firms is protected by NTMs, for any number of NTMs, than are unconnected firms. For instance, 78% of firms with a politically connected owner sell products protected from foreign competition by at least two different types of NTMs as compared to only 56% of all firms. The difference between NTM-protected politically connected firms (66%) and all non-connected (4%) firms is even more striking for products on which at least three different technical import barriers are imposed.

Column 4 looks instead at the percentage of large unconnected firms that sell products protected by NTMs, since most connected firms are large (with at least 200 employees). Again, although the differences are not as uniform, the percentage of connected firms with NTM-protected products is either approximately the same as, or significantly larger than, the percentage of large unconnected firms with NTM-protected products. A similar fraction of both (81–83%) sell products protected by at least one NTM. However, a much larger percentage of connected firms sell products protected by at least two or three NTMs (81 and 69%, respectively, versus 50 and 16%).

This is important since Malouche et al. (2013) argue that NTMs constitute more effective protection from foreign competition if multiple different NTMs are imposed on the same product. In fact, politically connected firms are never protected by just one NTM, but always sell products with at least two different types of NTMs. Most connected firms sell products protected by multiple import barriers (2 out of 3 sell products with at least 3 NTMs) which is not the case for unconnected large firms (1 out of 6 sell products with at least 3 NTMs).[31]

Columns 6–7 compare the share of NTM-protected *products* sold by 4-digit sectors occupied by at least one politically connected firm with the share of NTM-protected products exclusively sold by firms in unconnected sectors. Under both definitions of political connection, the share of products with NTM protection sold by connected firms is significantly greater than the share of products with NTM protection sold

[29] Observing the distribution of non-tariff technical barriers to import across all manufacturing or mining industries does not indicate that manufacturing or mining industries with more firms exhibit more barriers. If anything, more concentrated sectors benefitted disproportionally. 65% of all industries had some NTM protections, compared to only 56% of all firms.

[30] Large firms are defined as firms with at least 200 employees; there were 563 not politically connected manufacturing and mining firms in Egypt in 2006. We computed the number of large unconnected firms by subtracting the number of large politically connected firms, broad definition, from the total number of all large firms for each product group. We include large non-connected firms as an additional control group since these firms might have more similar characteristics (other than political connectedness) relative to connected firms, which are typically large firms.

[31] We cannot exclude the possibility that some large firms that we classify as unconnected were, actually, connected. However, it could also be the case that large connected firms coincidentally benefit from privileges that all large firms, connected and unconnected, receive.

Table 6 Politically connected firms are more likely to benefit disproportionately from NTMs the larger the number of NTMs in the product category

	Share of politically connected firms		Share of NOT-PC firms		Share of politically connected products		Share of NOT-PC products
NTMs (class B)	Owner	Broad	All	Only Large	Owner	Broad	
At least 1 per product	78%	81%	56%	83%	74%	75%	55%
	(0.000)	(0.003)			(0.027)	(0.016)	
At least 2 per product	78%	81%	27%	50%	74%	75%	52%
	(0.000)	(0.001)			(0.012)	(0.007)	
At least 3 per product	66%	69%	4%	16%	60%	59%	38%
	(0.000)	(0.006)			(0.016)	(0.017)	
At least 4 per product	21%	23%	3%	21%	23%	22%	7%
	(0.000)	(0.394)			(0.009)	(0.014)	
At least 5 per product	11%	14%	3%	18%	14%	14%	5%
	(0.028)	(0.758)			(0.086)	(0.090)	
At least 6 per product	8%	11%	2%	5%	12%	13%	3%
	(0.234)	(0.362)			(0.144)	(0.139)	
At least 7 per product	7%	8%	0%	5%	9%	9%	3%
	(0.017)	(0.414)			(0.132)	(0.190)	

WITS; establishment census data; sample of politically connected firms. "Share of politically connected firms" reports the (number of connected firms/number of all firms in the sector) in those sectors that sell products protected by the corresponding number of NTMs. "Share of NOT-PC firms" reports (number of unconnected firms/number of all firms in the sector) in those sectors that sell products protected by NTMs. Since politically connected firms are large, we also calculate "Only large", the (number of unconnected firms with more than 200 employees/number of all firms in the sector). "Share of politically connected products" is the (number of products protected by NTMs and sold by 4-digit sectors occupied by politically connected firms/total number of products). "Share of NOT-PC Products" is the (number of products protected by NTMs sold exclusively by firms that are not in the 4-digit sectors occupied by politically connected firms/total number of products). The significance level (*p*-values) for the statistical difference between politically connected firms or products sold by connected firms relative to all non-connected firms or products is reported in parentheses; it is based on a Pearson Chi2-test. We use the Fisher-test starting from products with at least 4 NTMs because of small samples to test for the significance.

exclusively by unconnected firms.[32] For example, 75% of the products sold by connected firms, broadly defined, were protected by at least two NTMs; only 52% of the products exclusively sold by unconnected firms enjoyed such protection. Nine percent of the products of connected firms were protected by seven or more NTMs, while only 3 % of the products sold only by unconnected firms enjoyed this level of protection.

We also used a probit regression to test the probability that a product is protected by at least one NTM, given that a connected firm sells it, after controlling for the average size and age of firms producing these products. The probability that a product is NTM-protected increases by 53% when a politically connected firm (broad definition) sells this product (the difference is statistically significant at the 5% level).[33] Not only were connected firms more likely to benefit from NTMs than other firms, but NTMs were also more likely to be granted to products manufactured by connected firms than to products manufactured by other firms.

8.2 Politically connected firms and energy subsidies

In 2010, subsidies to energy-intensive sectors accounted for 2.9% of Egyptian GDP (US$7.4 billion). Connected firms were more likely to be found in sectors that benefited from these subsidies. Moreover, qualitative evidence indicates that energy subsidies were targeted to individual firms. Egyptian firms required a government license to legally open a new factory in sectors that were heavy users of energy (steel, cement, etc.). Those licenses had to be renewed annually. Politically connected firms were both more likely to get the license and less likely to be exposed to predatory behavior (i.e., the non-renewal of a license after they had undertaken large sunk investments). By 2010, only a few, connected, firms had obtained the license guaranteeing access to the energy subsidies to firms in the cement and steel sectors.

To examine the targeting of energy subsidies more systematically, we classify whether a firm belongs to a low, moderate, or high energy-intensive sector. We then compare the distribution of politically connected firms and unconnected firms across 4-digit manufacturing industries with different energy intensities.[34] The first two columns of Table 7 show that politically connected firms are significantly more likely to operate in energy-intensive industries. Forty-nine percent of all connected firms operate in energy-intensive industries, compared to only 8 % of *all* unconnected firms and 30% of *large* unconnected firms. The difference is significant at the 1 % level. In contrast, politically connected firms are no more likely, or less likely, to be in less energy-intensive sectors. Similarly, the last two columns of Table 7 demonstrate that 36–38% of all politically connected industries, compared to only 10% of industries without a politically connected firm, are

[32] Note that almost all products are sold by at least one large firm and several smaller firms so that we cannot meaningfully separate product groups sold by primarily large unconnected or small unconnected firms.

[33] The results are available from the authors upon request. Note that we can only run such a probit regression at the (more aggregate) product but not the firm level since we cannot identify the individual politically connected firms in the establishment census data.

[34] See Table A2 in the Appendix for the UN classification of sector energy intensity. High energy-intensive industries account for 22% of all mining and manufacturing 4-digit industries, moderate energy-intensive industries for 37%, and low energy-intensive for 42%.

Table 7 Percent of firms and industries benefitting from energy subsidies

	Share of Politically connected FIRMS		Share of All NOT-PC Firms	Share of Large NOT-PC Firms	Share of Politically connected INDUSTRIES		Share of NOT-PC Industries
	Owner	Broad			Owner	Broad	
High Energy-Intensive Industry	49%	49%	8%	30%	38%	36%	10%
	(0.000)	(0.003)			(0.000)	(0.000)	
Moderate	28%	28%	63%	52%	24%	28%	34%
	(0.000)	(0.641)			(0.340)	(0.934)	
Low	23%	23%	29%	16%	38%	36%	56%
	(0.214)	(0.519)			(0.362)	(0.120)	

WITS; establishment census data; sample of politically connected firms. The significance level (p-values) for the statistical difference between politically connected firms or industries (columns 1–3 and 6–8) relative to all not-connected firms or industries is reported in parentheses; it is based on a Pearson Chi2-test. We use the Fisher-test (instead of the Chi2-test) to test for the significance in differences between PC and NOT-PC industries in case of small sample sizes. Large firms have at least 200 employees

highly energy-intensive. The differences are significant for both definitions of political connections. In contrast, the share of less energy-intensive industries does not change significantly between sectors with and without politically connected firms of any kind.[35]

We also used a probit regression to test the probability that a sector is in the "high" energy intensive category given that politically connected firms are present, after controlling for the average firm size and age in the industry. The probability that a 4-digit industry is high energy intensive increases by 100% when a politically connected firm (broad or owner definition) is operating in that industry (the difference is statistically significant at the 1% level).[36]

9 Connected firms are larger and more profitable

If political connections slow aggregate growth by driving a cost wedge between leading and trailing firms, politically connected firms should earn higher profits than unconnected firms. Connected firms should be able to accumulate larger market shares and therefore exhibit greater employment and revenues. In addition, protected from entry by competitors, the profits of connected firms should be larger. The evidence is consistent with each of these.

This comparison requires that we observe the political connections of individual firms and firms' accounting data including profits, etc. in the same firm level database. Only the Orbis database permits these comparisons. The database has employment data for about 20,000 establishments in Egypt. On average, the 385 connected firms have 1034 employees (broadest definition) compared to 254 employees among the remaining establishments. Orbis consolidated revenue data, available for 678 firms, reveals that 65 connected firms with revenue data had revenues of $177 million, on average, four times higher than the 613 unconnected firms between 2003 and 2010. Consolidated profits data are available only for 288 firms. Of these, the 48 connected firms had average net profits that were *six times* higher than the profits of the other 240 firms.

Table 8 presents the results of a more rigorous comparison of the size and profitability of connected and unconnected firms. The cells report the coefficients and *t*-statistics from an OLS regression of the performance variables (e.g., ln(revenues)) on a dummy variable that is equal to 1 for the different types of political connections and 0 otherwise. We demean the performance differences for the 1- and 2-digit sector level, respectively.

Along each performance dimension, the differences between politically connected and -un-connected firms are typically large in magnitude and statistically

[35] Energy-intensive sectors tend to exhibit greater capital intensity. An alternative explanation for the findings in Table 7 is therefore that connected individuals simply have better access to capital markets. However, this interpretation is consistent with the evidence provided in this paper that cronyism suppresses growth by lowering the costs (of access to capital) of connected firms compared to other firms in the sector. Indeed, the next section shows that firms in sectors with connected firms are more likely to report having access to credit.

[36] The results are available from the authors upon request. Note that we can only run the probit regression at the industry but not the firm level since we cannot identify the individual politically connected firms in the establishment census data.

Table 8 Simple within-sector differences, politically connected and other firms

	ln(Revenues)		ln(Assets)		ln(Profits / Rev)		ln(Profits / Assets)	
	PC vs. other establishments		PC vs. other establishments		PC vs. other establishments		PC vs. other establishments	
	Within 1-digit sector	2-digit	1-digit	2-digit	1-digit	2-digit	1-digit	2-digit
PC Broad	1.56**	1.64*	1.68**	1.37**	2.10**	2.12**	1.42**	1.60**
	(3.84)	(4.88)	(4.91)	(4.92)	(8.68)	(6.50)	(3.89)	(2.98)
PC Owner	1.60**	1.63**	2.03**	1.57**	1.74**	1.51**	1.17*	.900
	(2.69)	(3.09)	(5.05)	(4.68)	(2.79)	(2.56)	(1.71)	(1.38)
No. establish-ments	678	678	733	733	283	283	253	253

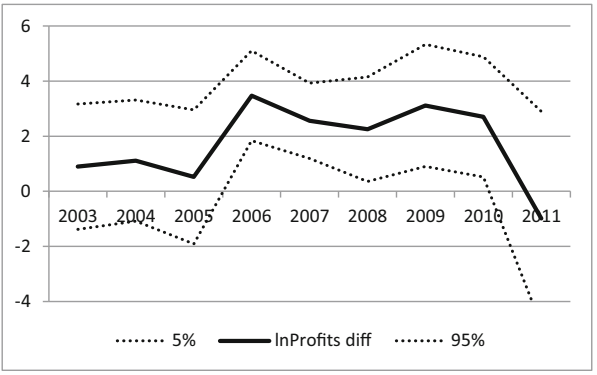
Orbis establishment database. The establishment data are pooled across years (2003–2011). The cells report the coefficients and *t*-statistics on the different types of political connection dummy variables from an OLS regression of the performance variable (e.g., ln(revenues)) on the dummy variable, which is equal to 1 for politically connected establishments and 0 otherwise. We demean the performance differences with the 1- and 2-digit sector averages, respectively. Standard errors are clustered at the 1- and 2-digit sector level, respectively. *, ** indicates that the coefficients are significant at the 5%, 10% level

significant. Connected firms are significantly larger in terms of revenue or assets. Connected firms earn higher profits on the revenues that they book. Moreover, for the most comprehensive category of connected firms, connected firms are more profitable (*ln*(profits/assets)), even restricting the comparison to connected and unconnected firms operating within the same 2-digit sectors, and although one of the advantages of connected firms is likely to be lower cost access to capital and, therefore, assets.

The data show that the profit advantage of connected firms varied with the strength of the Mubarak regime, consistent with the argument that connected firms were more profitable because of their connections, rather than some unobserved features of their entrepreneurial skill or products. Figure 3 illustrates this variation. It compares the profits of firms with political connections (broadest definition) relative to other (large) firms in the Orbis data and shows that the difference between the two was systematically related to the survival of the regime. The profits differential between connected and unconnected firms was large and significant between 2005 and 2010, but disappeared after the fall of the Mubarak regime on February 11, 2011 (the picture looks almost the same if we look instead at profits/assets instead of profits).

10 Privileges account for the profits of connected firms

The entry of connected firms into unconnected sectors slows employment growth and skews the distribution of firm size. The analysis in Aghion et al. (2001) points to one explanation for these findings: connected firms enjoy government privileges that drive a cost wedge between them and trailing firms in their sectors, reducing incentives to innovate. Consistent with this framework, connected firms are more likely to be in sectors that enjoy government privileges. They are also more



Source: Orbis establishment database. Note: The graph shows the differential in profits between politically connected (broad definition) and unconnected firms demeaned at the 2-digit sector level; the coefficient is derived from an OLS regression of net profits on 2-digit sector dummies as well as a dummy variable which is equal to 1 for politically connected establishments and 0 otherwise. The dotted lines show the 5% confidence intervals. The graph is qualitatively similar using the narrower definition of firms owned by politically connected businessmen.

Fig. 3 The evolution of net profit differentials between connected and other firms

profitable. In this section, we provide evidence for the final link in the causal chain: the privileges that connected firms enjoy account for their higher profits. That is, connected firms are more profitable to the extent that they benefit from government policy privileges.

Specifically, two of the privileges enjoyed by connected firms, protection from import competition and energy subsidies, account for their higher profitability, just as they should if these firms exhibit large and exogenous cost advantages. To see this, we use the following specification to estimate whether connected firms are more profitable, i.e. have higher rents for a given pattern of input use, because their products are more frequently protected from import competition or because they absorb more energy subsidies.

$$\begin{aligned} Y_{ist} = {} & \beta_B connected_{ist} + \beta_R Regulation_{st} \\ & + \beta_{BR} connected_{ist} * Regulation_{st} \\ & + \beta_X lnX_{ist} + \beta_t T + \varepsilon_{ist} \end{aligned} \tag{2}$$

Y_{ist} is the profitability (log of profits per assets) of firm i in the 4-digit sector s at time t. *Connected* is equal to one if firm i enjoys political connections of any type in the 4-digit sector s. The variable *regulation* measures either the number of NTMs (Class B) protecting the firm's products in sector s from import competition or a dummy variable equal to one if sector s is high energy-intensive (according to UN classification) enabling access to energy subsidies in Egypt, and zero otherwise. X_{is} is a matrix of firm level control variables, and T is a matrix of year dummies.

The analysis is based on Orbis firm survey data; this is the only database that allows us to identify individual connected firms and firms' accounting data. Profit and assets data are available for 253 larger manufacturing firms of which 48 are politically connected; our analysis is therefore focused on these 253 firms.[37]

Table 9 shows that broadly-defined connected firms are significantly more profitable than unconnected firms, controlling or not for firm age and firm size.[38] Narrowly-defined politically connected firms are equally profitable, on average. However, the coefficients on the interaction terms—whether firms are connected *and* located in sectors protected by NTMs—indicate that all politically connected firms, however defined, and located in sectors protected by NTMs, are significantly more profitable than unconnected firms. The interaction entirely accounts for the extraordinary profits of broadly-defined connected firms.

Moreover, by itself the NTM variable is insignificant, indicating that for firms that are unconnected, belonging to a four-digit sector protected by NTMs has no effect on their profits. This is precisely what we expect from the earlier arguments: connected

[37] We use ln(assets) instead of ln(employment) to measure firm size since many of the firms that report profit data do not report their (consolidated) number of employees in Orbis. Thus, we only observe employment and profits jointly for eleven politically connected manufacturing firms and 40 firms overall.

[38] Note that, in contrast to Table 9, we also control for firm size and age so that the coefficients differ somewhat.

Table 9 NTMs and energy subsidies account for the higher profitability of connected firms

Dependent Variable:	ln(Profits/Assets)									
PC broad firms	1.55**	1.57**	−1.72	1.53*	.581					
	(2.15)	(2.16)	(−0.74)	(1.89)	(0.60)					
PC owner firms						.845	.856	−3.65	.764	−.186
						(0.83)	(0.84)	(−1.21)	(0.71)	(−0.12)
NTMs		.090	.024				.076	.007		
		(0.34)	(0.09)				(0.29)	(0.02)		
PC broad * NTMs			.922*							
			(1.74)							
PC own * NTMs								1.25**		
								(1.98)		
High energy				.095	−1.31				.395	−.331
				(0.12)	(−1.16)				(0.51)	(−0.34)
PC broad * High energy					3.21**					
					(2.36)					
PC own * High energy										2.43
										(1.55)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Age	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Size: ln(assets)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of firms	253	253	253	253	253	253	253	253	253	253
R2	0.080	0.080	0.085	0.080	0.093	0.069	0.069	0.076	0.070	0.076

Orbis database, yearly panel 2003–2011 and list of politically connected firms. All regressions control for firm age, firm size, and time dummies. PC broad refers to firms that meet any definition of connectedness. PC owner refers to firms whose owners are politically connected. The sample includes all firms from the Orbis data with available information for the corresponding variables. The inclusion of dummies or the clustering of s.e. at the 1-digit sector level is redundant since we only have data for firms in the manufacturing sector. The standard errors are clustered at the year*sector (4-digit) level since we use annual firm panel data for multiple years. The year*sector clustering accounts for any correlation of the s.e. within a given year and sector due to year-sector specific shocks. The sector-level clustering also corrects for a potential bias in the standard errors which may arise if the variables of interest are more aggregated (4-digit sector level) than the depend variable (firm level); see Moulton (1990). *,** denote significance at the 10%, 5% significance level, respectively, t-statistics are reported in parentheses

firms in these sectors benefit from state privileges, such as NTMs, lowering their costs and giving them a competitive advantage; unconnected firms do not benefit from them.[39] This illustrates the discretion that could be used to enforce non-technical import barriers, such as import licenses, quality controls, or traceability requirements, to protect individual products within a sector, benefiting connected, but not unconnected firms operating in the same industry. This is consistent with the fact that connected

[39] As in the literature more generally, not all politically connected firms in Egypt exhibit a higher return on assets (higher ln(profits/assets). Those that are not could be those where the government has extracted more costly favors in exchange for political privilege. This is an especially plausible interpretation in light of the fact that the same connected businessmen often own multiple firms. They can more than offset the costs of favors in one of their enterprises with the privileges in others.

businessmen had a significant presence in the authorizing ministries. Trade protection in Egypt was thus firm- and not sector-specific.

Results are similar when we account for the joint distribution of political connections and energy subsidies in high energy intensive industries. Connected manufacturing firms in high energy-intensive industries are 3.2 or 2.4 times more profitable than unconnected firms in the same industries, using the broad and owner definitions of connectedness, respectively. This result again suggests that politically connected firms benefitted disproportionally from energy subsidies, and reflects the success with which requirements for government authorization to enter or expand in these sectors (e.g., cement and steel) ensured that access to the subsidies went only to a few (connected) firms. The results reflect that many politically connected manufacturing firms are in high energy intensive sectors and also sell products protected by non-technical import barriers (NTMs) – they benefit from both subsidies *and* trade protection.

This evidence supports two mechanisms linking connected firms' privilege to sector under-performance. Connected firms did, in fact, enjoy significant privileges that account for their profits; but these privileges were enjoyed by connected firms, and not all firms, in the sectors that received them.

11 Conclusions

The wealth of findings reported here contributes to a deeper understanding of the economic consequences of cronyism, shedding light on why the phenomenon could also have significant political consequences in countries ranging from Indonesia to Tunisia. In the Middle East, for example, the rate of job creation in the private sector has failed to keep up with the rate at which new (young) workers have entered the job market, a fact that many have linked to the Arab Spring uprisings. Tepid job creation has also shown the limits of apparently significant market reforms that countries in the region adopted over the past ten years. One hypothesis that explains slow job creation, despite the relaxation of many formal, de jure regulatory and legal obstacles to private sector activity, is that "crony capitalism" has circumvented market reforms and continued to stifle competition, productivity growth, and job creation. We provide support for this hypothesis with data from Egypt.

Additional work is needed to fully evaluate the macro-economic impact of cronyism and to predict how the Egyptian economy would have performed in the absence of cronyism. For instance, we would like to better evaluate the impact of political connections on unconnected sectors: did connected sectors weaken forward and backward linkages with unconnected firms, thereby exacerbating negative effects on aggregate growth (Jones 2011)?

One implication of our results is to cast doubt on the feasibility of industrial policy under a closed political system. While this was successful in other parts of the world, it has not worked in Egypt nor in Tunisia (Rijkers et al. 2014). Industrial policies, often viewed as an essential element of a strategy to diversify Middle East economies in the face of the over-valuation of exchange rates caused by oil and remittances revenues, may have perverse effects in environments dominated by rent-seeking.

We have not focused in this paper on the broader political-economy of cronyism – in particular, on the services that connected firms supplied to the regime in exchange for

regulatory and fiscal privileges. This is also an important subject for future research. Similarly, we have not discussed the implications of cronyism for income inequality, another important driver of the Arab Spring Uprisings – the regime of cronyism must have led to the emergence of a very rich 1 %. Moreover, the slow growth of the formal private sector must have exacerbated the prevalent labor market dualism in Egypt, increasing the inequality of opportunities in the labor markets.

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References

Acemoglu, Daron, Tarek Hassan and Ahmed Tahoun (2014). "The power of the street evidence from Egypt's Arab spring." NBER Working Paper No. 20665.

Aghion, P., Harris, C., Howitt, P., & Vickers, J. (2001). Competition, imitation and growth with step-by-step innovation. *The Review of Economic Studies, 68*(3), 467–492.

Ahram Online (2010, 2011). http://english.ahram.org.eg/NewsContent/3/12/8793/Business/Economy/All-the-king%E2%80%99s-men-Who-runs-Mubaraks-money-.aspx, http://english.ahram.org.eg/NewsContent/1/64/2466/Egypt/Politics-/Businessmen-to-run-parliamentary-business.aspx.

Albrecht, G. (2002). *Soziologische Erklärungsansätze individueller Gewalt und ihre empirische Bewährung*. Internationales Handbuch der Gewaltforschung. VS Verlag für Sozialwissenschaften, 763–818.

Alley, A. L. (2010). The rules of the game: Unpacking patronage politics in Yemen. *Middle East Journal, 64*(3), 385–409.

Bertrand, M., Kramaraz, F., Schoar, A., & Thesmar, D. (2007). Politicians, firms and the political business cycle: Evidence from France. In *Unpublished working paper, University of Chicago*.

Boubakri, Narjess, Jean-Claude Cosset and Walid Saffar. (2008). "Politically connected firms: An international event study." Unpublished working paper. HEC Montreal.

Chekir, H., & Diwan, I. (2015). Crony capitalism in Egypt. *Journal of Globalization and Development. ISSN (Online)*, 1948–1837.

Claessens, S., Feijen, E., & Laeven, L. (2008). Political connections and preferential access to finance: The role of campaign contributions. *Journal of Financial Economics, 88*, 3, 554–580.

Cull, R., & Lixin Colin, X. (2005). Institutions, ownership, and finance: The determinants of profit reinvestment among Chinese firms. *Journal of Financial Economics, 77*(1), 117–146.

Demmelhuber, T. and S. Roll (2007). "Maintenance of Domination in Egypt: The Role of Reforms and Economic Oligarchs." Stiftung Wissenschaft und Politik (SWP), Deutsches Institut für Internationale Politik und Sicherheit.

Earle, J. S., & Gehlbach, S. (2015). The productivity consequences of political turnover: Firm-level evidence from Ukraine's Orange revolution. *American Journal of Political Science, 59*(3), 708–723.

Faccio, M. (2007). Politically connected firms. *American Economic Review, 96*, 369–386.

Faccio, M. (2010). Differences between politically connected and nonconnected firms: A cross-country analysis. *Financial Management, 39*, 905–928.

Faccio, M., Masulis, R. W., & McConnell, J. J. (2006). Political connections and corporate bailouts. *Journal of Finance, 61*, 2597–2635.

Fisman, R. (2001). Estimating the value of political connections. *American Economic Review, 91*, 1095–1102.

Fisman, R., & Wang, Y. (2013). The mortality cost of political connections. In *Working paper, Columbia University*.

Goldman, E., Rocholl, J., & So, J. (2008). *Political connections and the allocation of procurement contracts*. Indiana University Working Paper.

Haber, S., & Maurer, N. (2007). Related lending and economic performance: Evidence from Mexico. *The Journal of Economic History, 67*, 551–581.
Haddad, B. (2012). *Business networks in Syria: The political economy of authoritarian resilience*. Stanford, CA: Stanford University Press.
Henry, C. M., & Springborg, R. (2010). *Globalization and the politics of development in the Middle East* (Vol. 1). Cambridge: Cambridge University Press.
Herrendorf, B., Rogerson, R., & Valentinyi, Á. (2014). Growth and structural transformation. In *The Handbook of Economic Growth, volume 2, chapter* (Vol. 6, pp. 855–941).
Heydemann, S. (Ed.). (2014). *Networks of privilege: Rethinking the politics of economic reform in the Middle East*. New York: Palgrave Macmillan.
Hussain, S., & Schiffbauer, M. (2015). Firm dynamics and job creation in Egypt. *World Bank, mimeo.*
Johnson, S., & Mitton, T. (2003). Cronyism and capital controls: Evidence from Malaysia. *Journal of Financial Economics, 67*, 351–382.
Jones, C. I. (2011). Intermediate goods and weak links in the theory of economic development. *American Economic Journal: Macroeconomics, 3*, 1–28.
Khwaja, A. I., & Mian, A. (2005). Do lenders favor politically connected firms? Rent provision in an emerging financial market. *Quarterly Journal of Economics, 120*, 1371–1411.
Kienle, E. (2004). Reconciling privilege and reform. In S. Heydemann (Ed.), *Networks of privilege: Rethinking the politics of economic reform in the Middle East* (pp. 281–296). New York: Palgrave Macmillan.
King, S. J. (2009). *The new authoritarianism in the Middle East and North Africa*. Bloomington: Indiana University Press.
Kroszner, R. S., & Stratmann, T. (1998). Interest group competition and the Organization of Congress: Theory and evidence from financial services' political action committees. *American Economic Review, 88*, 1163–1188.
Loewe, M. (2013). Industrial policy in Egypt 2004-2011. In *DIE discussion paper 13/2013*. Deutsches Institut fuer: Entwicklungspolitik, Bonn.
Malouche, M., Reyes, J.-D., & Fouad, A. (2013). New database of nontariff measures makes trade policy more transparent. *World Bank, mimeo.*
Moulton, B. R. (1990). An illustration of a pitfall in estimating the effects of aggregate variables on micro units. *The Review of Economics and Statistics, 72*(2), 334–338.
Oberholzer-Gee, F., & Leuz, C. (2006). Political relationships, global financing, and corporate transparency: Evidence from Indonesia. *Journal of Financial Economics, 81*, 411–439.
Owen, R. (2004). *State, power and politics in the making of the modern Middle East. London*. New York: Routledge.
Parente, S. L., & Prescott, E. C. (2002). *Barriers to riches*. MIT press.
Ramalho, R. (2003). *The effects of anti-corruption campaign: Evidence from the 1992 presidential impeachment in Brazil*. Working Paper: M.I.T.
Rijkers, B., Freund, C., & Nucifora, A. (2014). The perils of industrial policy: Evidence from Tunisia. In *Mimeo, the World Bank*.
Roberts, B. E. (1990). A dead senator tells no lies: Seniority and the distribution of federal benefits. *American Journal of Political Science, 34*, 31–58.
Roll, Steven (2010). "Finance matters!' The influence of financial sector reforms on the development of the entrepreneurial elite in Egypt." Mediterranean Politics 15:349–370.
Sfakianakis, J. (2004). The whales of the Nile: Networks, businessmen and bureaucrats during the era of privatization in Egypt. In S. Heydemann (Ed.), *Networks of privilege: Rethinking the politics of economic reform in the Middle East*. New York: Palgrave Macmillan.
Tlemcani, R. (1999). *Etat, Bazar, et Globalisation: L'Aventure de l'Infitah en Algerie*. Algiers: Les Editions El Hikma.
Vivarelli, Marco (2012). "Innovation, Employment and Skills in Advanced and Developing Countries: A Survey of the Literature." IZA Discussion Paper Series 6291, Institute for the Study of Labour (IZA), Bonn.
Voth, H.-J., & Ferguson, T. (2008). Betting on Hitler – The value of political connections in Nazi Germany. *Quarterly Journal of Economics, 123*, 101–137.
World Bank. (2007). *Doing Business 2008*. Washington: The World Bank. and the International Finance Corporation.
World Bank. (2014). *Jobs or privileges: Unleashing the employment potential of the Middle East and North Africa*. Washington, DC: World Bank.