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## **CSAE Working Paper WPS/2016-27**

# The Politics of Partial Liberalization: Cronyism and Non-Tariff Protection in Mubarak's Egypt

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### **Abstract**

This paper provides one of the first systematic empirical assessments of the impact of political connections on trade protection. Based on a unique compilation of sector-level data on non-tariff measures (NTMs) and politically connected businessmen in Mubarak-era Egypt, we explore the within-sector variation in NTMs over time, and show that sectors populated by politically connected businessmen witnessed systematically higher incidence and density of non-tariff protection. Our results suggest that the presence of cronies is a strong predictor of the subsequent introduction of NTMs. Crony presence also shapes the density of NTMs as measured by the share of products subject to NTMs. Our results are derived from robust empirical methods that simultaneously address temporal dependence, fixed effects and endogeneity concerns. To establish causality, we take advantage of the across the board cut in tariffs in the wake of the EU-Egypt free trade agreement in 2004-05 to show that sectors with crony activity were compensated significantly more by new NTMs than non-crony sectors.

*JEL codes:* F13; F14; O24; O53; P26

# 1 Introduction

During the 2000s, Egypt underwent a period of rapid economic liberalization characterized by, amongst others, a considerable fall in the country's trade tariffs. Yet, as shown in Figure 1, trade liberalization was partial in a two-fold sense: on the one hand, falling average tariffs gave rise to a noticeable increase of non-tariff measures (NTMs) across the Egyptian economy; on the other hand, this increase affected sectors unequally with some seeing their level of non-tariff protection heightened more than others as the rising standard deviation of NTM protection across sectors demonstrates. This paper identifies politically connected entrepreneurs as a major driving force behind this partial liberalization.

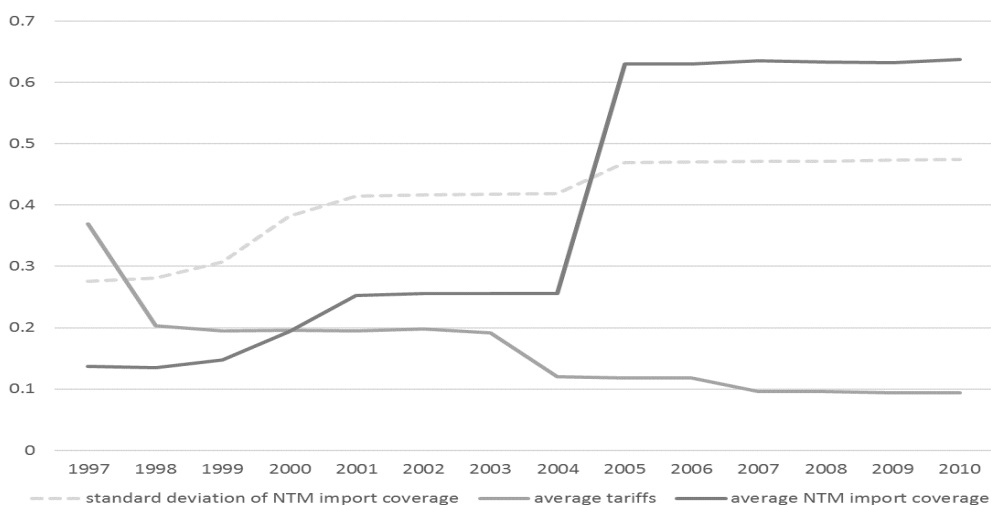


Figure 1: Evolution of Trade Protection in Egypt, 1997-2010

To do so, we make use of the recently available WITS database (World Bank, 2013) which provides extensive information on the nature and the introduction of NTMs over time and across sectors. We combine these data with an original dataset on crony capitalists in the late-Mubarak period, allowing us to identify the entry of cronies into specific sectors. We focus our analysis on Egypt for two reasons. First, the Egyptian uprising in 2011 and the ensuing uncovering of the entrenched networks linking business elites and the state has enabled us to collect data on cronies at a hitherto unprecedented level of detail, allowing for variation across sectors and across time. Second, in 2004 Egypt concluded a free trade agreement with the European Union which entailed an nearly universal cut of tariffs across Egyptian manufacturing sectors. We capitalise on this shock to assess the extent to which cronies were better able to lobby for compensatory measures in the form of NTMs.

Exploring the within-sector variation of NTMs over time, we first use conditional logit and GMM models to demonstrate that sectors which transition from being non-crony to crony in period  $t$  are systematically associated with higher incidence and intensity of NTMs in  $t+1$ . More specifically, we show that, as cronies enter a sector for the first time, the likelihood of a subsequent NTM introduction increases significantly. In addition, our results also reveal that the number of products subject to an NTM, that is, the intensity of NTM protection, increases significantly as cronies venture into a new sector. While we control for unit and time fixed effects and ensure that crony entry temporally precedes the introduction of an NTM, these results cannot be interpreted as conclusive evidence for a causal link between crony presence and non-tariff trade protection. Cronies could have insider knowledge and enter a sector in anticipation of an assured NTM introduction; alternatively, there could be uncontrolled confounders positively correlated with both crony entry and the propensity for NTM protection.

To establish causality, the paper utilises a difference-in-difference approach, leveraging the across the board cut in tariffs in the wake of the EU-Egypt free trade agreement in 2004-05, which was accompanied by the introduction of a vast number of new NTMs in 2005. More specifically, we show that all sectors which by 1998 – six years prior to the conclusion of the trade agreement – had been populated by cronies witnessed a significantly higher rise in NTM protection in response to the trade agreement than non-crony sectors. Treating only sectors with early crony presence as ‘crony’ alleviates concerns that these businessmen selected into sectors knowing that an NTM protection would follow. Moreover, the nearly universal cut in tariffs in the wake of the agreement allows us to use the conclusion of the agreement as an exogenous shock which it was difficult to select out of.

To fully rule out remaining concerns of endogeneity, we also instrument for the presence of cronies by 1998 with two exogenous predictors: the share of other cronies in neighbouring sectors, and crony sectors in the Tunisian economy. Regarding the former, we argue that this measure is a valid instrument as cronies will seek to avoid sectoral neighbourhoods that are already densely populated by cronies as this would decrease the amount of rent they can extract from this sector. Regarding the latter, we argue that the nature of crony capitalism in North Africa is such that cronies will enter similar sectors, that is, sectors with higher barriers to entry as a result of licensing and other legal barriers. The results obtained from this identification strategy are consistent with the initial correlation between crony entry and NTM protection in the data: compensation through NTMs was significantly higher in crony sectors than in non-crony sectors following the trade agreement. These results are robust to different measurements of crony activity as well as initial sectoral characteristics, sector and

time fixed effects, and sectoral time trends.

This paper speaks to a number of different literatures. It, first, significantly enhances our understanding of the politics of trade protection through non-tariff barriers. While the significant rise of NTMs in both the developed and developing world has been recognized (Hoekman and Nicita, 2011; Kee, Nicita and Olarreaga, 2006; Grilli, 1988), the literature on the determinants of NTMs has almost uniquely focussed on Western economies (Ray, 1981*b,a*; Ray and Marvel, 1984; Esfahani, 2005; Gawande and Bandyopadhyay, 2000; Azrak and Wynne, 1995; Trefler, 1993). Lee and Swagel (1997) include developing countries in their analysis but only consider cross-country variation, just like Esfahani and Squire's (2007) analysis of Middle Eastern countries. Grether et al.'s (2001) study of Mexico and Ancharaz' (2003) study of sub-Saharan Africa only look at tariffs. Furthermore, most existing studies of endogenous trade protection necessitate a democratic political context for the theoretical mechanisms to play out (Caves, 1976; Hillman, 1982; Bauer, de Sola Pool and Dexter, 1972; Coughlin, 1985; Blonigen and Figlio, 1998; Magee, Brock and Young, 1989); the most prominent mechanism being campaign contributions (see, for instance, Lopez and Pagoulatos, 1996). A notable exception is Pack's (1994) study of Indonesian trade protection. However, he finds little evidence for political lobbying, claiming that political explanations of trade protection 'have a more tenuous base in authoritarian developing countries' (Pack, 1994, 450). Our findings strongly qualify this claim.

Second, the paper contributes to the literature on cronyism and the effect of political connections. Recent empirical work on crony capitalists has made great strides by highlighting the effect of political connections on firm value and performance (Ferguson and Voth, 2008; Fisman, 2001; Faccio, 2006; Claessens, Feijen and Laeven, 2008; Fan, Wong and Zhang, 2007; Goldman, Rocholl and So, 2009; Li et al., 2008); leverage (Boubakri, Cosset and Saffar, 2008); access to loans (Khwaja and Mian, 2005); and the likelihood of a bail-out (Faccio, Masulis and McConnell, 2006). Yet while all these studies have analysed the effect of preferential treatment on crony companies, there is little empirical research on whether and how cronies can leverage their connections to shift policies in their favour. By demonstrating the effect of cronies on trade protection, this article thus considerably expands the literature on cronyism to incorporate its wider policy relevance.

Third, the paper contributes to broader debates about the political economy of reform, and rents and political order. Selective liberalization has been a pervasive feature of IMF and WB sponsored initiatives for economic reform. Van der Walle (2001) terms it as the 'partial reform syndrome'. This paper provides a concrete illustration in the arena of trade policy and uncovers in empirical detail the political underpinnings as well as the losers and winners

of partial economic reform. In essence, it shows how, in the wake of liberalization, one mode of protection was simply replaced by another. Partial reforms are also key to understand how authoritarian political orders are reproduced by the creation of new rent streams. Traditionally, rents have been linked with state intervention in the economy (Krueger, 1974; Bhagwati, 1982). But, as this paper demonstrates, rents can also be generated from economic liberalization during which the benefits and losses are distributed selectively across different sectors of the economy (King, 2003; Malik, 2015). This pattern of rent generation is particularly important for MENA economies that derive relatively few rents from natural resources but have extensive distributional commitments (the labour-abundant types). For these regimes, such regulatory rents are central for sustaining an authoritarian political order and they serve as an important commitment device between economic elites and the regime.

The paper is structured as follows: Section 2 provides descriptive background on the forms of NTMs and the nature of cronyism in late-Mubarak Egypt. Section 3 introduces our data. Section 4 presents our results, and Section 5 concludes with a few thoughts on the broader implications of our findings.

## 2 Background: Cronyism and NTMs in Egypt

### 2.1 CRONYISM IN EGYPT

The rise of Egyptian crony capitalists in the late Mubarak era was intimately linked to Gamal Mubarak's ascendancy in the regime's ruling party, NDP. Instrumental in his rise to power was his alliance with Egypt's aspiring business elite, which had succeeded in accumulating unprecedented economic resources, but were still not part of regime's inner ruling circle. Willing to build his own power base, the trained investment banker therefore began to reach out to private sector actors as soon as he returned from London in 1996. As head of the influential US-Egypt Business Council and board member of the newly founded Egyptian Center for Economic Studies (ECES) – a market-liberal think-tank – he nurtured numerous contacts into the business world and managed to form a coalition favourable to more far-reaching economic reforms (Abdel-Latif and Schmitz, 2010).

Having become the NDP's secretary general in 2000, he set out to rejuvenate the leadership of the ruling party by bringing in members of the new business elite, whom he gathered in the new Political Secretariat established in 2002. Pressuring for a resumption of economic reforms, it was this forum that paved the way for the appointment of a new, ostensibly pro-business cabinet under Prime Minister Nazif in 2004. The new government not only forcefully

relaunched economic reforms, such as privatisation, capital, and trade liberalisation, but also brought a number of Gamal’s business friends into ministerial positions.

Table 1 gives an overview of the economic activities of the most prominent crony capitalists in the late Mubarak era. They have been active in both the service and the manufacturing sector, with an increasing importance of service activities, such as telecommunication or real estate investment, since the early 2000s. Wherever they have been active in manufacturing, they have tended to play a preponderant role on the market. The most notorious example of market domination is Ahmed Ezz, whose Ezz Steel Mills came to dominate the Egyptian steel market. Benefiting from family connections into the army, Ezz had become the country’s biggest steel producer by the late 1990s. Controlling 65-75 per cent of the Egyptian market (Chekir and Diwan, 2013), Ezz’s market share was seven times higher than the share of his strongest competitor (Selim, 2006). Although his anti-competitive behaviour was widely known and even became the matter of a public report, no anti-trust procedure was instituted against him. Another example is Safwan Thabet’s Juhayna Group, one of Egypt’s largest producers of juices and dairy products. Found guilty of monopolistic practices, the company settled its case by paying a fine in 2013. In the sector of soap and detergent’s, Ibrahim Kamel’s Kato Group dominates the market, supplying half of the country’s hotels with his products.

Thanks to their abundant cash reserves, many of Egypt’s oligarchs also expanded into the country’s booming service sector. For instance, Naguib Sawiris, one of three Sawiris brothers active in the family’s business empire, launched Egypt’s first mobile operator, Mobinil, in 1998. In 2007, he sought to acquire the public Banque du Caire, which was offered for privatisation. This attempt to gain a foothold in the Egyptian banking sector only failed because of political intervention. Another mainstay of the core elite’s business activities is the lucrative import of luxury consumption goods. Holding exclusive franchising licences of international car manufacturers, such as General Motors, Volvo, or Mitsubishi, the Nosseir, Ghabbour, Mansour, and Mahmoud family have reaped enormous benefits from the growing demand of Egypt’s middle and upper classes.

| <b>Actor</b>    | <b>Company</b>       | <b>Sector</b>               |
|-----------------|----------------------|-----------------------------|
| Arafa family    | Arafa Holding        | Textiles                    |
| Hamed El-Chiaty | Travco Group Holding | Tourism                     |
| Diab family     | Pico Group           | Food products and beverages |

|                       |   |                                       |
|-----------------------|---|---------------------------------------|
|                       | Pico Engineering  | Industrial and construction equipment |
|                       | Pico International Petroleum                            | Mining and natural resources          |
|                       | Pico Energy Group                                       | Food products and beverages           |
| Mohammed Abu El-Enein | Cleopatra Group   | Household equipment                   |
|                       |   | Industrial and construction equipment |
|                       |   | Mining and natural resources          |
| Ahmed Ezz             | Ezz Group Holding for Industry and Investment           | Industrial and construction equipment |
|                       |   | Finance, investment, real estate      |
| Shafik Gabr           | Artoc Auto  | Automobile sector                     |
|                       | Artoc Auto Free Zone                                    |                                       |
|                       | Artoc Petroleum   | Mining and natural resources          |
|                       | Alpha Metal   | Industrial and construction equipment |
| Ghabbour family       | Ghabbour Group  | Automobile sector                     |
| Ibrahim Kamel         | Kato for Agricultural Development                       | Food products and beverages           |
|                       | National Food Company                                   |                                       |
|                       | Giza National Dehydration                               |                                       |
|                       | Giza Seeds and Herbs                                    |                                       |
|                       | Kato Aromatic   | Chemical and pharmaceutical industry  |
|                       | The Modern Factory for Manufacturing Soap and Detergent |                                       |
|                       | Kato Construction                                       | Finance, investment, real estate      |



|                    |   |  |
|--------------------|---|--|
| El-Maghraby family | Maghraby Agriculture                          | Food products and beverages<br>Other agricultural products   |
|                    | Maghraby Optical                              | Optical lenses   |
|                    | Mansour & Maghraby Investment and Development | Finance, investment, real estate   |
|                    | Maghriby Hospitals                            | Health services  |
|                    | Maghraby Foundation                           |  |
| Mohammed Khamis    | Oriental Weavers                              | Textiles   |
| Mahmoud family     | Mohamed Mahmoud Sons Group                    | Automobile sector<br>Industrial and construction equipment<br>Leather products   |
| Mansour family     | Mansour Group                                 | Automobile sector<br>Cigarettes, cosmetics<br>Food products and beverages<br>Household equipment<br>Entertainment and IT<br>Industrial and construction equipment<br>Retail<br>Tourism |
|                    | Mansour & Maghraby Investment and Development | Finance, investment, real estate   |
| Mohammed Nosseir   | Alkan Holdings                                | Automobile sector  |

|                |                                    |   |
|----------------|------------------------------------|---|
|                |                                    | Textiles                                    |
|                |                                    | Medical products                            |
|                |                                    | Tourism                                     |
|                |                                    | Finance, investment,<br>real estate         |
| Rachid family  | Rachid Group                       | Retail                                      |
| Hussein Salem  | Meridor Plant for Gas Distillation | Mining and natural<br>resources             |
|                | East Mediterranean for Gas         | Household equipment                         |
| Sallam Family  | Olympic Group                      | Chemical and<br>pharmaceutical<br>industry  |
| Sawiris family | Egyptian Fertiliser Company        |   |
|                | Egypt Basic Industry Cooperation   |   |
|                | OCI Nitrogen                       |   |
|                | OCI Beaumont                       |   |
|                | Sorfert Algerie                    |   |
|                | Gavilon                            |   |
|                | Orascom Construction Industries    | Finance, investment,<br>real estate         |
|                |                                    | Industrial and<br>construction<br>equipment |
|                | Orascom Telecom (Mobinil)          | Telecommunication                           |
|                | Orascom Hotels and Development     | Tourism                                     |

|                        |                                       |   |
|------------------------|---------------------------------------|---|
| El-Sewedy family       | Elsewedy Engineering                  | Industrial and<br>construction<br>equipment |
|                        | Elsewedy Transformers                 |   |
|                        | Elsewedy Cables                       |   |
|                        | Egyplast                              |   |
|                        | Egytech                               |   |
|                        | Egytech Cables A1                     |   |
|                        | Elastimold Egypt                      |   |
|                        | Elsewedy SEDCO                        |   |
|                        | Elsewedy SEDCO for Petroleum Services |   |
|                        | Giad-Elsewedy Cables                  |   |
|                        | PSP                                   |   |
|                        | UEIC Elsewedy                         |   |
|                        | United Industries                     |   |
|                        | United Wires                          |   |
|                        | United Metals                         |   |
|                        | Egyptian Company for Manufacturing    |   |
|                        | Electrical Insulators                 |   |
|                        | ISCRA                                 |   |
|                        | Israemeco                             |   |
|                        | Measurement and Energy Systems        |   |
| Talaat Mustapha family | Talaat Mustapha Group                 | Finance, investment,<br>real estate         |
| Safwan Thabet          | Juhayna Group                         | Food products and<br>beverages              |

Table 1: Economic Activities of Prominent Egyptian Crony Capitalists

Source: Adapted from Roll (2010).

The nature of their political connections took various forms. Some of them were confidants of the presidential family. Others co-invested with the Mubarak family in joint business ventures. And many of them had indeed direct political links to the ruling party and government institutions (see Table 2). Sallam held NPD party membership and Khamis was an MP in the Egyptian upper house. Others more actively pursued a political agenda and

became influential members in the upper echelons of the NDP. As an MP in the Egyptian lower house, Abu El-Enein was head of the committee on housing and later the committee on industry and energy. Mohammed El-Sewedy was a member of the NDP's Business Secretariat. Unrivalled in his party activities was Ahmed Ezz who was present in nearly all influential committees within the NDP, including the General Secretariat and the Political Bureau. As head of the budget committee, he was also a key figure in the Egyptian parliament. According to the last president of the parliament, Fathi Sorour, Ezz was the key player in parliament and able to mobilise large majorities in his favour (quoted in Kandil, 2010). Another group of oligarchs took on ministerial posts in the Nazif government, which came to office in 2004. Rachid (Trade and Investment), Maghrabi (Housing), and Mansour (Transport) all held portfolios which were closely related to their own business activities. In total, by the late 2000s, government and ruling party had become 'the principal steering committee of Egypt's private sector' (Arafat, 2009, 40).

| <b>Actor</b>           | <b>Political Connection</b>  |
|------------------------|--|
| Hamed El-Chiaty        | Member of the High Council of Tourism  |
| Mohammed Abu El-Enein  | MP: Chairman of Housing Committee (2000-5), Industry and Energy Committee (2005-10)  |
| Ahmed Ezz              | MP: Chairman of Planning and Budget Committee (2000-10)<br>NDP: Secretary for Organisational Affairs, member of General Secretariat and Political Bureau |
| Shafik Gabr            | NDP: Member of Political Secretariat   |
| Ghabbour family        | Family contacts to Mubarak family  |
| Ibrahim Kamel          | NDP: Member of General Secretariat   |
| El-Maghraby family     | Minister of Tourism (2004-5) and Housing (2005-11)<br>NDP: Member of Business Secretariat  |
| Mohammed Khamis        | MP   |
| Mansour family         | Minister of Transport (2004-11)  |
| Rachid family          | Minister of Industry (2004-11)<br>NDP: Member of General and Political Secretariat   |
| Hussein Salem          | Family contacts to Mubarak family  |
| Sallam Family          | NDP: Member<br>Member of National Youth Council  |
| Sawiris family         | NDP: Member of Business Secretariat<br>Head of Industrial Training Council   |
| El-Sewedy family       | NDP: Member of Business Secretariat  |
| Talaat Mustapha family | MP: Head of Housing Committee  |
| Safwan Thabet          | Family contacts to Mubarak family  |

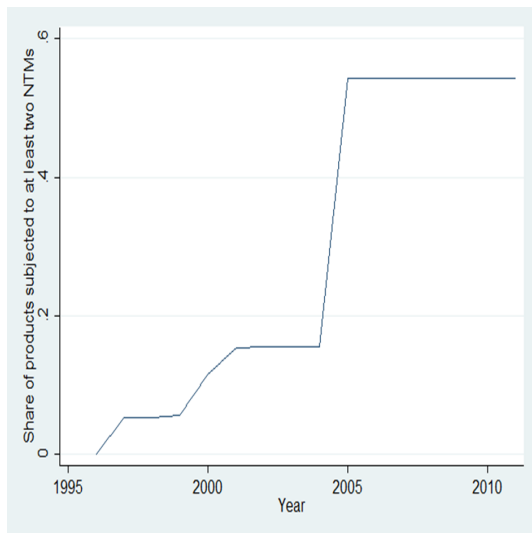
Table 2: Political Connections of Prominent Egyptian Crony Capitalists  
Source: Alissa (2007); Demmelhuber and Roll (2007); Roll (2010, 2013).

## 2.2 NTMS IN EGYPT

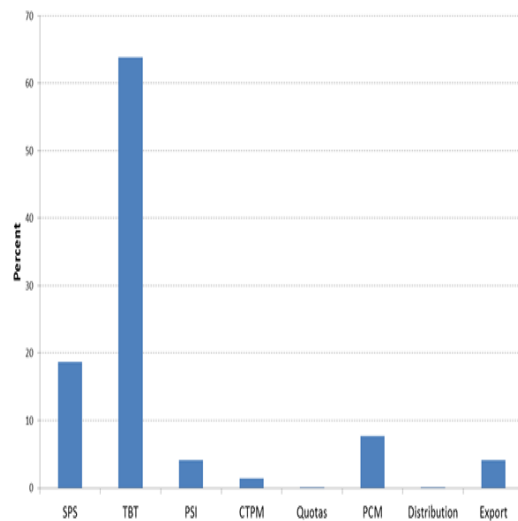
With multilateral trade liberalization leading to a generalized decline in tariff barriers, non-tariff measures, commonly known as NTMs, have attained growing prominence in developing economies, including the Middle East (Chauffour, 2011; Augier et al., 2012). Unlike tariff barriers, however, the NTMs are not easily quantifiable as they usually consist of complicated legal texts that defy a simple characterization. Yet, they can have a profound impact on trade performance. NTMs are essentially complicated trade frictions caused by arbitrary regulations, procedures, and a variety of discretionary controls, which given their opaque and invisible nature, are both hard to measure and evaluate. With the availability of a more refined and structured classification of NTMs available in the WITS database (World Bank,

2013), it is now possible to conduct a more systematic analysis of the form and function of these trade measures. More specifically, this database is unique in that it not only allows us to distinguish between different types of NTMs applied but, more importantly, when NTMs were introduced, which adds temporal variation to the data. The new system of classification divides NTMs into 16 different chapters and assigns them to two main categories, technical and non-technical measures (the third category consists of export-related measures). Some of the key NTM categories include: Technical Barriers to Trade (TBT), Sanitary and Phytosanitary Measures (SPS), Pre-shipment Inspection (PSI), and Price Control Measures (PCMs).

Egypt is among the top five countries globally that have the largest number of products affected by NTMs. Nearly 5,000 different products are affected by NTMs. Since the late 1990s, the use of NTMs has increased dramatically and today nearly 60 percent of products are covered by two or more NTMs (see Figure 2a). The technical barriers to trade (TBTs) are the most dominant NTM type in Egypt, followed by SPS measures (see Figure 2b). Overall, more than 60 percent of products are covered by TBTs and a little less than 20 percent of products are subjected to SPS measures. The three most prevalent TBT categories were all related to conformity assessments (B84, B859 and B89) that require inspections and administrative oversight. These are precisely features that can invite discretionary action and impose additional burden on firms in dealing with bureaucracy.



(a) Share of products subjected to at least two NTMs



(b) NTMs by type in Egypt

Figure 2: Evolution and Type of NTMs in Egypt

### 3 Data

To measure the effect of political connections on NTMs, we use a novel dataset on crony businessmen in Egypt. The dataset was compiled in the following manner: First, we delineated the pool of potential crony entrepreneurs based on Roll’s (2010) list of Egypt’s financial and economic core elite. This list consists of entrepreneurs whose net assets reached or exceeded 100 million US\$ in the late 2000s.<sup>1</sup> Using information from the Orbis database (Bureau van Dijk, 2013), we added to this list all shareholders who had co-invested with these businessmen or were present in the board or the management of their companies.

In a second step, we assessed the degree to which the entrepreneurs on this extended list were politically connected. We therefore defined three channels of political connections: (a) connections by virtue of holding a political office, being a member of parliament, or a member in a major committee of the former National Democratic Party (NDP) (*politicians*); (b) connections established through business relations with the Mubarak family, most notably Gamal Mubarak (*associates*); (c) connections resulting from strong personal relationships with the Mubarak family, mostly through marital links or publicly known friendships (*confidants*). Based on these different types, we define crony businessmen in a narrow sense as all those who have known political connections (*politicians*). Cronies in a broader sense include *associates* and *confidants* in addition to *politicians*. For about a quarter of the entrepreneurs from the initial list, we could not establish any political connection and hence dropped them from our crony list.

In a third step, we collected information on the economic activity and date of foundation of all companies in which crony businessmen were either minor or major shareholders or of which they were CEOs. This information was mostly obtained from Orbis (Bureau van Dijk, 2013) and occasionally supplemented from additional sources if needed.<sup>2</sup> Companies for which we could not identify the date of establishment were dropped from the list. Activity information was collected at the four-digit level of the International Standard Industrial Classification (ISIC, Rev. 3.1).

Based on this time-varying crony information, we derive our main crony variable: *crony presence* is a binary dummy and indicates in each year whether cronies are operating in a sector. Since we are interested in cronyism in the late Mubarak period, we only use crony entries from 1997 onwards and aggregate all information prior to 1997. This means that

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<sup>1</sup>Whilst it might be a daunting endeavour to measure the net assets of cronies in other developing economies, the rapid development of the Egyptian stock exchange with its concomitant reporting requirements allows a relatively precise estimation of assets.

<sup>2</sup>These include the companies own websites and other online databases, such as *Kompass*.

some sectors are already populated by cronies at the onset of our analysis. The resulting variable is time-varying from 1997 until 2011 and measures crony activity at the sector-year level.<sup>3</sup> For our main analysis, we use the broad definition of cronies and conduct robustness tests with a more restrictive crony definition in the Online Appendix.

Information on NTMs is taken from the WITS dataset (World Bank, 2013), which documents NTMs at the six-digit product level and details the date when an NTM was introduced.<sup>4</sup> Since all other data are available at the sector level, we aggregate the NTM product level information at the four-digit sector level and generate a number of indicators to capture different dimensions of non-tariff trade protection. *NTM intro* is a dummy variable and indicates if any NTM is introduced in a specific sector-year. Since we do not observe the withdrawal of NTMs in the period under observation, the variable essentially remains invariant once an NTM has been introduced. In addition to binary measures, we use a number of more refined measures to capture the density as opposed to the presence of NTM protection. *NTM share* measures the share of products in a sector subject to NTMs. Similarly, *NTM2 share* measures the share of products subject to at least two NTMs. Both variables are derived from the product level information in the original WITS data.<sup>5</sup> Finally, *NTM chapter* designated the average number of chapters applied in a sector.

Regarding control variables, we are limited by the type of time-series data available at the four-digit sectoral level.<sup>6</sup> Using data from WITS (World Bank, 2013), we use three main control variables: *Imports* and *Exports* measure the value of imports and exports respectively in each sector-year. In addition, we control for the average most-favoured nation tariff (*MFN*) applied in a sector. All three variables exhibit a considerable degree of skewness and are therefore log-transformed. Table 3 provides summary statistics of our data.

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<sup>3</sup>We do have information on economic activity after 2011 but limit our analysis to the period until the downfall of Mubarak. For later periods, we cannot safely assume that political connections persisted in their pre-2011 form.

<sup>4</sup>Note that the the NTM database does not distinguish between the introduction of a new NTM and a major amendment of an NTM, both of which require a legal decree.

<sup>5</sup>In the Online Appendix, we run additional tests for individual NTM chapters to assess which type of NTM is more susceptible to political lobbying.

<sup>6</sup>To address this problem, we are in the process of digitising the Egyptian annual industrial bulletins, which contain rich data at the ISIC4 level. Alternatively, we could use UNIDO (2013) industrial statistics which provide additional variables, such as the number of employees per sector. However, UNIDO data are only available in irregular intervals, which would result in a highly unbalanced panel. Given this drawback, we give preference to the WITS data.



Table 3: Summary Statistics

| Variable       | Mean  | Std. Dev. | Min.  | Max.   | N    |
|----------------|-------|-----------|-------|--------|------|
| NTM intro      | 0.07  | 0.255     | 0     | 1      | 2542 |
| NTM new        | 0.305 | 1.322     | 0     | 15     | 2535 |
| NTM cum        | 1.381 | 2.074     | 0     | 10.591 | 2535 |
| NTM share      | 0.336 | 0.423     | 0     | 1      | 2542 |
| NTM2 share     | 0.33  | 0.422     | 0     | 1      | 2535 |
| NTM chapter    | 0.552 | 0.814     | 0     | 3.188  | 2535 |
| Crony presence | 0.653 | 0.476     | 0     | 1      | 4480 |
| Imports (log)  | 7.104 | 1.818     | 0     | 12.673 | 1649 |
| Exports (log)  | 5.095 | 2.065     | 2.398 | 12.391 | 1556 |
| Tariffs (log)  | 2.46  | 1.131     | 0     | 8.215  | 2462 |

## 4 Empirical Analysis

As the preceding discussion shows, Egyptian economy has been profoundly shaped by two developments since the late 1990s: the growing presence of politically-connected actors in business and the introduction of trade liberalization. In this section we empirically examine whether the two are inter-related. Specifically, we are interested in exploring whether there is a distinct trade dimension to political cronyism. We conduct a number of complimentary statistical tests to assess the effect of cronyism on non-tariff protection from different empirical angles. Broadly speaking, we are interested in two phenomena: the presence (or density) of NTMs and its relationship with cronyism. Section 4.1 begins the empirical analysis by presenting some exploratory evidence on the effect of prior crony presence on the incidence and intensity of NTM protection. After ascertaining the robustness of these empirical patterns, we next furnish a more serious attempt at establishing the causal effect of cronyism on NTM protection in section 4.2. To do this, we exploit the variation in NTM introduction induced by the EU-Egypt trade policy agreement of 2004, which is, by far, Egypt’s most dramatic trade policy shift since independence.

### 4.1 EXPLORATORY EVIDENCE

Our preliminary empirical analysis is divided into two distinct but inter-related segments. Firstly, we investigate whether crony activity drives the introduction of NTMs across sectors and over time. Secondly, our empirical models explore whether the presence of cronies is systematically associated with the higher prevalence (or density) of NTMs. To answer the first question we estimate a logistic model where the dependent variable captures the binary

information on whether or not an NTM was introduced in a particular sector and year. Our core variable of interest is also a dichotomous indicator, which is coded as one when a political crony is present in a given sector and year. To address the second question, we estimate dynamic GMM models that explore variation in the share of products covered by NTMs (*NTM share*). In each case, our prime focus remains on determinants of within-sector variation in the application of NTMs over time. We would like to test whether the prior presence of cronies determines the subsequent introduction of NTMs.

#### 4.1.1 *Conditional logit models*

To discern the effects of crony presence on NTM introductions, we take cue from the event history analysis that treats the dependent variable as capturing recurring events, such as the onset of civil war, introduction of an IMF programme or transition to democracy. Using the repeated introductions of NTMs as a binary dependent variable and, following Beck, Katz and Tucker (1998), we estimate conditional logit models that integrate standard discrete time methods while controlling for fixed effects. Combining the conditional logit model with approaches developed for events history allows us to treat the underlying data as Binary Time Series Cross Section (BTSCS), which consist of realizations of zeroes and ones generated by an underlying latent variable, such that:

$$\begin{aligned}
 y_{st}^* &= x_{s,t-1}\beta + \varepsilon_{st} \\
 y_{st} &= 1 \text{ if } y_{s,t}^* > 0 \\
 y_{st} &= 0, \text{ otherwise}
 \end{aligned}$$

where  $s$  denotes sector and  $t$ , time;  $y_{s,t}$  is a binary variable indicating whether or not an NTM was introduced in a particular sector and year; and  $x_{s,t-1}$  is a vector of observed covariates, including the crony presence indicator. To mitigate potential endogeneity concerns, all right-hand side variables are lagged by one year.

There are two challenges to estimating such dynamic binary choice models: controlling for fixed effects and duration dependence. Accounting for unobserved sector-specific fixed effects in non-linear panel data models is not straightforward, as the standard way of estimating fixed effects can generate the well-known incidental parameters problem. Conditional logit models try to surmount this by conditioning on fixed effects rather than including them in the model. Conditional logit relies on units (sectors) that experience change in the response variable over time. We use a variant of this approach that involves conditioning on the

actual number of successes in a group (see Beck (2015)).<sup>7</sup> Another modelling challenge arises from the possibility of temporal dependence, including the presence of unit roots and serially correlated errors (Arellano 2003; Browning et al. 2006). Our empirical approach explicitly models duration dependence, by allowing the possibility that the occurrence of an event depends both on the number of previous events and the time elapsed since the last occurrence. This is particularly relevant in our case, since the introduction of new NTMs can depend on the duration of non-eventful spells (the period during which no new NTM is introduced). To account for temporal dependence, we use time-spell polynomials that capture the length of non-events (sequence of zeroes preceding an NTM introduction) (Carter and Signorino, 2010).<sup>8</sup> Our models also include the number of previous NTM introductions (*Prefail*). This takes on board advice by Beck, Katz and Tucker (1998) to model the underlying hazard of an event (NTM introduction, in this case).<sup>9</sup>

The results for our conditional logit analysis are presented in Table 4. The conditional logit drops all sectors that exhibited no variation during the whole sample period – essentially sectors that were either subjected to NTMs during the entire period or no NTMs at all. This leaves us 1125 observations spanning over 75 sectors and 15 years. Although we allow the sample size to vary across specifications depending on availability of data on controls, there were, on average, 12 observations per group. To allow within-sector correlations in the errors, we use standard errors that are robust and clustered at the sectoral level. The initial patterns of results provide strong support to our hypothesis. Column 1 shows that lagged crony presence is a strong predictor of NTM introductions. Sectors with a prior presence of cronies are systematically more likely to have an NTM introduced in the subsequent year. Besides lagged crony presence, our baseline specification includes various spell variables and a discrete variable capturing the number of previous NTM introductions (*Prefail*). The negative and statistically significant coefficient on *Prefail* suggests that there is systematically lower probability of new NTMs being introduced in sectors that have previously experienced more NTMs. The coefficients on spell dummies are also statistically significant, providing strong evidence in favour of duration dependence. Overall, the probability that a spell will

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<sup>7</sup>As Beck (2015) shows this has superior finite sample properties compared to the conventional fixed effects logit.

<sup>8</sup>Essentially, the procedure entails construction of a series of temporal dummy variables that measure duration of prior spells of NTM introductions, and a set of time polynomials (splines) to model temporal dependence. We use the ‘btses’ package in stata to estimate the spell dummies.

<sup>9</sup>This approach bears close resemblance to the proportional hazard models, where the conditional hazard of the event of interest happening may increase or decrease over time. The logit analysis in event history can therefore be viewed as estimating the yearly hazards of NTMs switching from zero to one. See Beck, Katz and Tucker (1998), Zorn (2000); Carter and Signorino (2010).

die varies with the duration for which it lasts.

To ensure that the relationship between cronyism and non-tariff protection that we have begun to explore is not simply attributable to un-modelled heterogeneity in the data, we successively add a variety of relevant controls for which data is easily available in columns (2-4). These include three plausible determinants of trade protection: the levels of imports (col. 2), exports (col. 3) and average MFN tariffs (col. 4), all lagged by one period. As with the crony variables, we use the lagged values of these controls. As the results show none of these variables exerts a statistically significant impact on our dependent variable beyond the effects we have already highlighted. In fact, even when all controls are simultaneously included in model in column (4), the coefficient on lagged crony presence remains positive and statistically significant at 1 percent level. Figure 3 provides a graphical illustration of the effect of crony presence on the probability of NTM introduction. While the average probability of an NTM introduction in sectors without crony presence lies at 53 percent, the transition to a crony sector increases this probability to 79 percent on average – an increase by nearly 50 percent.

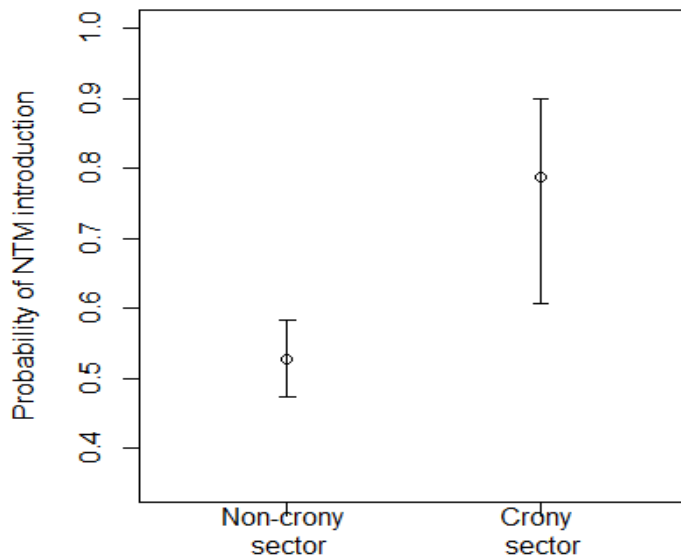


Figure 3: Predicted probability of NTM introduction by crony presence  
Note: Probabilities based on estimates in column 4, Table 4 .

A related line of enquiry is whether crony presence predicts the transition of a sector from the non-NTM to an NTM world, not just whether an NTM is introduced or not. For this we redefine our dependent variable to capture the first-ever introduction of an NTM in a sector. Although this reduces our sample to 307 four-digit sectors, the results are instructive. As shown in column 5, lagged crony presence turns up as the strongest predictor, with a coefficient that is positive and statistically significant at 1 percent level. As expected, the prior presence of cronies in a sector make it more likely to switch from a non-NTM sector to one subjected to an NTM. While the duration dummies become redundant in this context and are therefore excluded from the model, the cronyism effect remains robust to the inclusion of the other covariates (imports, exports and MFN tariffs). Lagged tariffs turn up as the only significant control besides crony presence. Overall, the results in Table 4 provide a strong and consistent evidence in favour of our prior: sectors populated by cronies were systematically more likely to experience introduction of an NTM in the subsequent period. In the Online Appendix, we shed additional light on whether cronyism also influences the intensity of protection, as measured by the number of NTMs introduced, and the types of NTM barriers imposed.

#### 4.1.2 GMM models

Our logit analysis afforded useful insights on transition dynamics by asking whether prior presence of cronies might predict whether a sector makes a transition from the non-NTM to an NTM world. Another relevant dimension is to relate cronyism to the density (or overall burden) of NTM protection, as measured by the share of products in each sector subjected to NTMs. There is significant variation in the NTM coverage of products, ranging anywhere from 19% of products in a given sector subjected to NTMs to nearly 100%. About 25% of the manufacturing sectors in our sample have all their products covered by NTMs. We wish to ask whether prior presence of cronies in a sector drives some of this variation in NTM coverage across sectors. Exploring these models of NTM density has the added advantage that they permit the use of more robust empirical methods that simultaneously allow us to address temporal dependence, unobserved heterogeneity and endogeneity concerns. To relate NTM density with cronyism we estimate dynamic GMM models of the following form:

$$y_{st} = \alpha y_{s,t-1} + \beta CronyPr_{s,t-1} + \gamma x_{s,t-1} + \varepsilon_{st}$$

where  $y_{s,t}$  denotes the share of products covered by NTMs (*NTM share*),  $CronyPr_{s,t-1}$  is an indicator variable capturing prior crony presence, and  $x_{s,t-1}$  is the vector of control variables. To allow unobserved and time-invariant heterogeneity at the sector level and for

common shocks, the error term,  $\varepsilon_{st}$ , includes sector-specific fixed effects ( $u_s$ ) and year-specific intercepts ( $\lambda_t$ ) besides serially uncorrelated measurement errors ( $v_{st}$ ), such that:

$$\varepsilon_{st} = \mu_s + \lambda_t + \nu_{st} \text{ for } s = 1, \dots, S; t = 1, \dots, T.$$

When expressed in first differences the equation takes the following form:

$$\Delta y_{st} = \alpha \Delta y_{s,t-1} + \beta \Delta CronyPr_{s,t-1} + \gamma \Delta x_{s,t-1} + \Delta \varepsilon_{st}$$

This dynamic specification eliminates the sector-specific fixed effects ( $u_s$ ) through first-differencing. Consistent estimation of Equation 4.1.2, however, requires the use of instrumental variables to deal with the potential endogeneity of regressors and the implied correlation between differences of the lagged dependent variable and the new error term structure induced by first differencing. Subject to certain assumptions, including the requirement that the time varying component of the disturbance is independent across sectors and serially uncorrelated, dynamic panel GMM estimators permit the use of lagged levels of variables as internally generated instruments (see Arellano and Bond (1991); Roodman (2013) for details)<sup>10</sup>. However, for highly persistent series, lagged levels may serve as weak instruments, potentially resulting in a serious finite sample bias in first-differenced estimators.

In the presence of weak instruments and short panels Blundell and Bond (1998) favour the use of the *System* GMM estimator, which combines the equations in first differences with the equations in levels (also see Arellano and Bover (1995)). Subject to the validity of some additional assumptions, *System* GMM permits the use of lagged levels of the series as instruments in the first-differenced equations and lagged differences of the series as instruments in the levels equations.<sup>11</sup> The *System* estimator is particularly relevant for our context, since our dependent variable (*NTM share*) and main variable of interest (*CronyPr*) is possibly subjected to slow change over time. The consistency of *System* GMM crucially hinges on the validity of lagged instruments, which, in turn, is implied by the absence of serial correlation in the error term ( $v_{st}$ ). The validity of instruments and the underlying moment conditions can be tested using the Sargan test of overidentifying restrictions and the separate tests for serial correlation in the differenced residuals suggested by Arellano and Bond (1991).

The tests of serial correlation also guide the choice of our precise specification, especially the number of lags to be included. We consider all time-varying regressors as endogenous, instrumenting their first differences with past levels. For the dependent variable we use values,

<sup>10</sup>Specifically, consistent estimation relies on the assumption that the initial conditions are predetermined, so that  $E[y_{s1}\varepsilon_{st}] = E[CronyPr_{s1}\varepsilon_{st}] = E[x_{s1}^k\varepsilon_{st}] = 0$ , for  $t=2, \dots, T$ ,  $s=1, \dots, S$ , and  $k=1, \dots, K$  and it is consistent in  $S$ , the number of sectors, given  $T$

<sup>11</sup>Specifically, the following assumptions are required to hold:  $E[\Delta y_{s2}u_s] = E[\Delta CronyPr_{s,t}u_s] = E[x_{s,t}^k u_s] = 0$

lagged five periods or more, as potential instruments. Explanatory variables, including crony presence, are instrumented using values lagged three periods or more. Estimations are carried out on an annual sample of 75 sectors that exhibited some transition dynamics with respect to NTMs during the period, 1997-2011. Results are presented in Table 5. We begin by asking whether sectors that switch their status from non-crony to crony experience greater change in the subsequent period in the share of products covered by NTMs (*NTM share*). Column (1) provides confirmatory evidence in this regard: the coefficient on lagged crony presence is positive and statistically significant at the 1% level. Importantly, the crony effect is robust to the inclusion of key controls, such as the lagged imports, exports and MFN tariffs (all in natural logs). Our models also control for three lags of the dependent variable, coefficients on all of which are positive and statistically significant, indicating strong persistence effects in the *NTM share*.

We next relate crony presence with another measure of the intensity of NTM protection: share of products in a sector that are covered by at least two NTMs (*NTM2 share*). The corresponding result in column (2) shows that the coefficient on lagged crony presence is positive and significant at 1% level. A related exercise in column (3) probes whether lagged crony presence predicts changes in another measure of NTM protection, defined as the average number of different NTM chapters applied in a given sector-year (*NTM chapter*). To pass the serial correlation tests the specification now includes five lags of *NTM chapter* (two of which, lags 1 and 4, have statistically significant coefficients). Despite allowing for this temporal dependence, lagged crony presence has a positive and weakly significant impact on the intensity of NTM protection. As before, our models include several control variables for which the data is easily available. Results for these accord well with our priors. While tariffs do not have a significant impact, trade structure variables appear to exert a significant impact in most specifications. The coefficient on imports is consistently negative and statistically significant, suggesting lower levels of NTM protection for sectors reliant on imports. Model diagnostics lend support to our specifications, as we can comfortably reject the null of second-order serial correlation in all columns.

Taken together, these results present a consistent pattern, and support the contention that sectors that become crony over time tend to experience a greater burden of NTM protection, regardless of the NTM measure used. . We draw greater confidence from these GMM results, since they assuage concerns about the influence of unmeasured time-invariant sector-specific effects that could be correlated with our included regressors. GMM panel data estimators are also robust to measurement error concerns and provide a possible remedy for the simultaneity problem.

However, while we use lagged crony presence to predict future changes in NTM protection, and deploy lagged values of regressors as instruments, this might leave some selection issues unaddressed, notably the possibility that prior crony presence is not completely independent of our outcome of interest (future NTM protection). For example, the underlying political process in Egypt could have led connected actors into systematically entering sectors that subsequently received higher levels of trade protection. This would prevent us from making any causal claim about the effect of cronyism on trade protection. In the empirical analysis that follows, we subject our cronyism hypothesis to a more severe test by restricting our analysis to a period during which Egypt underwent a major trade policy shift, and asking whether sectors that were previously populated by cronies disproportionately benefited from this shift.

## 4.2 FURTHER TESTS OF IDENTIFICATION

In this sub-section we present an alternative identification strategy aimed at establishing the causal effect of cronyism on non-tariff protection. In this regard, we exploit the timing of the EU-Egypt trade agreement and sectoral differences in prior exposure to cronyism to investigate the politics of trade protection. Egypt signed a major trade association agreement with the European Union (EU) in 2001, which came into force in January 2004 and ushered in an era marked by an unprecedented trade liberalization. The main thrust of this agreement was on the reduction of tariff barriers. Average tariffs for the manufacturing sector fell from an average of 27 percent in 1998 to about 20 percent. However, the tariff reduction was followed, a year later, by a compensatory application of non-tariff measures. In 2005 Egypt witnessed the largest wave of NTM introductions. The focus of our analysis is on whether sectors populated by cronies prior to the EU trade agreement witnessed larger increases in NTMs after 2004. To investigate the differential impact of trade liberalization and to throw light on the empirical validity of the cronyism hypothesis, we set up a standard difference-in-difference (DID) regression framework. Before proceeding further, we set out the relevant background for this liberalization episode and specify the identification strategy in more detail.

### 4.2.1 *The Egypt-EU Trade Agreement*

Trade liberalization began in earnest in 1999, a few years after Egypt became a member of the WTO in 1995. This was preceded by a number of important economic and political developments during the period, 1999-2004, which set the stage for the effects of cronyism we



want to study. In July 1999 Egypt and the United States signed the Trade and Investment Framework Agreement (TIFA). This was, however, only a preliminary step towards a free trade agreement between the two countries, whose effect really kicked in 2005 after the formation of Qualified Industrial Zones (QIZs) in Egypt in December 2004.<sup>12</sup> The year 2004 was a watershed moment in Egyptian trade policy for another more important reason, which provides the focus of this study: the signing of the trade agreement with the European Union (EU), which resulted in an across the board reduction in tariff barriers. The Agreement foresaw elimination of all industrial duties over a period of 15 years, with duties on raw materials and industrial equipment faced with a 25% reduction each year from 2004 to 2007. With this dismantling of tariffs, half of EU's industrial exports to Egypt were to be liberalized by 2007.<sup>13</sup>

After the agreement was reached in June 2004 Egypt began implementing the most far-reaching changes to its MFN tariff structure, which, by September 2014, reduced the number of tariff bands to twelve. Later, in December 2004, Egypt initiated a major programme for harmonization of its trade standards with international standards. Importantly, the dramatic reduction in tariffs and the compliance of standards was followed, a year later, by a major upward shift in the application of non-tariff measures. This was a fairly generalized shock that affected nearly all manufacturing sectors. About 75% of all sectors that experienced a tariff reduction in 2004 witnessed an increase in NTMs in 2005. There was also significant heterogeneity across sectors in the application of these NTMs over time. The question we wish to ask is whether politically connected sectors witnessed systematically larger increases in NTMs.

The Egypt-EU trade agreement provides an ideal setting to explore this politics of partial liberalization. Firstly, economic relations with EU carry immense significance for Egypt, as it is Egypt's single largest trade partner, its 'main source' of FDI, and its second largest donor after United States. Secondly, the EU trade agreement were largely determined outside Egypt's domestic political domain.<sup>14</sup> The various trade pacts Egypt signed after 2001 were

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<sup>12</sup>It is important to note here that the Qualifying Industrial Zones (QIZ), which were part of a larger strategic drive to protect exports of Egypt and Jordan, the two major signatories of the peace process with Israel (Egypt and Jordan), mainly ensured duty free access of Egyptian exports to US markets. They had no tariff implications for imports entering Egypt.

<sup>13</sup>Duties on industrial supplies, semi-manufacturing goods and construction material were to be reduced by 10% in 2007 and 15% in each successive year till 2013.

<sup>14</sup>This is also true for the wider economic reform programme that was implemented by Hosni Mubarak during the decade of 2000s. After 9/11 the US foreign aid package to Egypt, totalling US\$2 billion, was directly tied with economic and political reform (<http://articles.latimes.com/2005/feb/28/world/fg-egypt28>). The only domestic political driver of these reforms was Mubarak's incentive to use economic reforms as a way to buy external legitimacy by strengthening his reformist credentials.

driven by the strategic external imperative that unfolded after 9/11. As el-Khoury (2008: p.3) notes: “Shortly after 9/11, the connection between trade policy initiatives and security strengthened as the U.S. administration argued that global trade liberalization was a central plank of its national security and antiterrorism efforts.” The EU followed suit: “The 9/11 attacks renewed EU interest in the MENA region and reinvigorated the Barcelona Process” (el-Khoury: p.4). This resulted in the US and EU signing a series of FTAs in key Middle Eastern states.<sup>15</sup> European trade agreements are especially significant in the North African context, which, due to its geographic proximity, is part of Europe’s strategic neighbourhood.<sup>16</sup>

In this backdrop, Egypt’s trade agreement with EU can be treated as a relatively exogenous development with respect to its domestic political economy. It is also reasonable to assume that political cronies had little, if any, role in driving the trade agreement, especially in a milieu where the business-state relationship is typically organized in a hierarchical, centralized and top-down fashion. Scholars on the Middle East would tend to concur that major decisions on external trade relations are usually taken without substantive input from domestic business associations (see Cammett (2007)).<sup>17</sup> While there is no evidence to suggest that cronies pushed for the EU trade agreement, they were nevertheless in a privileged position to leverage this trade policy shift in their favour after it had happened. This is because the Nazif cabinet, which contained several political cronies associated with the National Democratic Party (NDP), was sworn in six months after the EU agreement came into force.

#### 4.2.2 *Identification*

Leveraging these trade policy developments, we set up a panel DID framework to identify the causal impact of cronyism. We are interested in exploiting prior sectoral differences in exposure to cronyism to predict the evolution of NTMs over time. We restrict this empirical exercise to the period, 2001-2011, during which Egypt’s manufacturing sector witnessed substantive trade liberalization. Setting our cut-off year as 2004 when the EU agreement came into force, we define the post-period as including the year 2005 and after. To assuage concerns of endogenous entry, our treatment measure is pre-determined with respect to the

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<sup>15</sup>A wave of FTAs were signed with crucial states in North Africa and Levant, including Morocco, Tunisia, Lebanon, Jordan, and Egypt. Some of these FTAs were part of a larger effort to create the Euro-Mediterranean Free Trade Area (EMFTA) by 2010.

<sup>16</sup>As el-Khoury (2008: p. 14) observes: “EU’s two-way trade with the region is nearly three times that of the United States. In investment, lending, and aid, Europe also outstrips regional U.S. activity”

<sup>17</sup>Hertog (2010) has similarly stressed how Saudi Arabia’s accession to the WTO was part of external conditionality, and defined by a singular absence of internal feedback from relevant business stakeholders.

introduction of EU agreement. Sectors are classified as treated if they were populated by cronies during the period, 1996-98. This is a conservative strategy, since we know cronies continued to enter after 1998. By classifying sectors that were exposed to cronyism after 1998 as non-crony we are actually tipping the scales against our finding.

Focusing on cronies that entered far back in time reduces the possibility of an anticipation effect. It is improbable that cronies that entered far back in time could have predicted which sectors would witness a tariff cut and a concomitant rise in NTM protection six years later. This is particularly unlikely given Egypt’s long-held tradition of centralized decisionmaking and high levels of policy uncertainty, and a trade negotiation process that was not completely in the hands of central authorities. Our basic DID specification can be set out as follows:

$$y_{it} = \beta Cronyn_i \cdot I_t^{Post} + \gamma X_{it} + \Phi_j \lambda_{it} + \sum_s \theta_s I_i^s + \sum_{j=2002}^{2011} \rho_j I_t^j + \varepsilon_{it},$$

where  $i$  denotes a sector and  $t$  represents time. The dependent variable,  $y_{it}$ , is either the cumulative number of NTMs (*NTM cum*) or number of new NTMs applied in a given sector-year (*NTM new*). Our main variable of interest is  $Cronyn_i$ , which is a measure of treatment intensity defined as the total number of cronies present in a sector during the period, 1996-98. As is common in the literature, we define a binary indicator,  $I_t^{Post}$ , which is equal to one for all years after 2004 (i.e. 2005-2011), and interacted with the pre-determined crony measure. The coefficient of interest on this interaction term is  $\beta$ , which is the estimated impact of prior crony exposure on the cumulative evolution of NTMs. Our baseline specification also includes a vector of time-varying controls  $X_{it}$ , sector and year fixed effects,  $\sum_s I_i^s$  and  $\sum_j I_t^j$ , and sector-year interactions that control for sector-specific time trends ( $\lambda_{it}$ ).<sup>18</sup>

Like any DID exercise, random assignment remains a perennial concern. The validity of our empirical strategy depends on the assumption that the treatment of crony sectors should be exogenous to the future trajectory of NTMs. Another assumption behind our analysis is that events that take place during or after the 2004 EU agreement should equally affect the comparison groups. Defining a reasonable control group is another challenge, which can be partly addressed by ensuring that the treatment and control groups do not display divergent trends with respect to NTMs prior to the EU agreement. Reassuringly, a visual inspection of the data suggests a similar trajectory of the cumulative evolution of NTMs for the two groups (see Figure 4). We will provide more formal empirical tests of this parallel trends assumption in the analysis that follows.

<sup>18</sup>Sector fixed effects control for all time-invariant factors that are specific to each sector, whereas time fixed effects account for secular patterns in the evolution of NTMs.

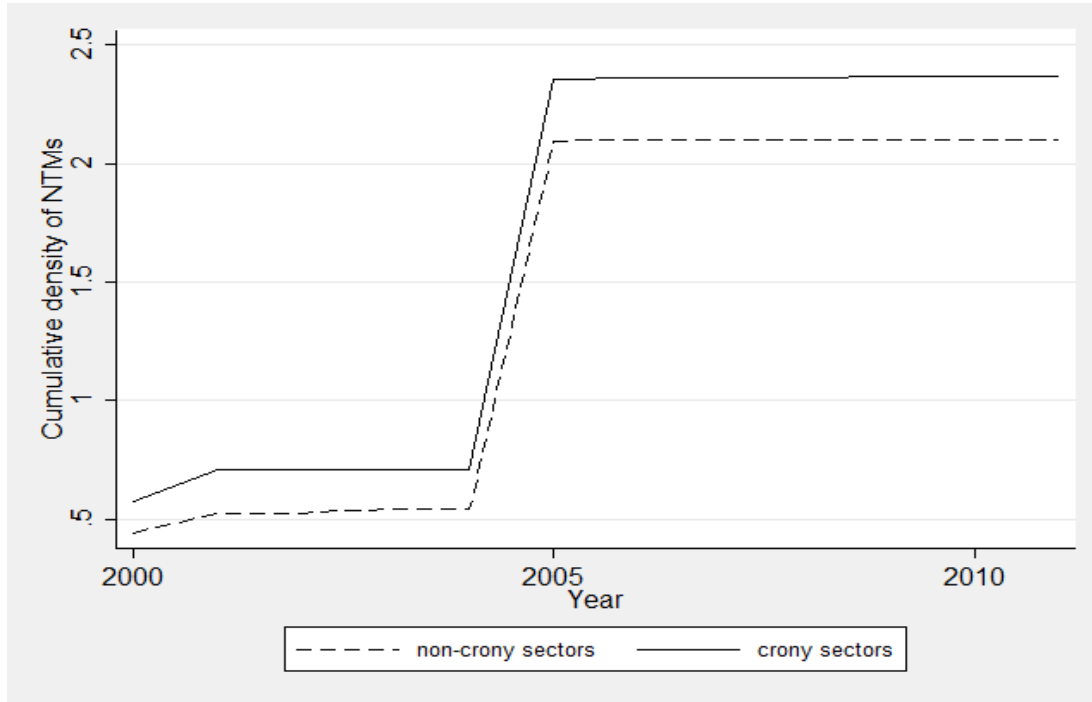


Figure 4: The evolution of non-tariff measures in Egypt

#### 4.2.3 DID Results

Table 6 presents the results for our baseline specification, which includes, besides our main variable of interest, sector and year fixed effects, as well as time-varying sector fixed effects to control for unobserved heterogeneity. Starting with models for NTM density ( $NTM_{cum}$ ) in column (1), we find a positive and statistically significant coefficient on the interaction between crony count and  $Post$  indicator. This result continues to hold in column (2) when we add a variety of controls, including the log of total imports, exports and MFN tariffs, all weighted by the number of products in a given sector-year. In columns (3-4) we repeat the same exercise for a different dependent variable, number of new NTM introductions ( $NTM_{new}$ ). As before, our coefficient of interest ( $\beta$ ) on the interaction between treatment intensity and  $I_t^{Post}$  turns up as positive and statistically significant at the 1% level. Taken together, these results support our prior, in that sectors more densely populated with cronies in the pre-period (1996-98) systematically witnessed a greater introduction and density of NTMs after 2005.

Inference in panel data models can be complicated by the presence of serial correlation in the error term. While we cluster standard errors by sector, an additional remedy proposed

by Bertrand, Duflo and Mullainathan (2004) is to run a two-period DID where temporal information is collapsed into two periods. To implement this we average the dependent variable and controls over the pre- (2001-2004) and post-periods (2005-2011). The results, reported in columns (5-6), provide confirmatory evidence. The estimated coefficient on *Crony* interaction remains positive and statistically significant at 1% level in both models for *NTM cum* (col. 5) and *NTM new* (col. 6). As before, sectors that attracted a larger number of cronies in late 1990s witnessed greater cumulative increase in NTMs as well as new NTM introductions after the EU agreement.

#### 4.2.4 Robustness Tests

Reassured by these findings, we next conduct a battery of robustness tests to check whether the relationship between cronyism and trade protection we are trying to develop withstands a number of variations.

*Extended controls.* A possible concern that we would need to address is that our crony assignment might be correlated with initial sectoral characteristics that could determine exposure of sectors to both cronyism and NTMs over time. To ensure that our results are not driven by trends in other confounding factors, we include an extended set of control variables that are all measured prior to our estimation period (1996-98) and interacted with the full set of year fixed effects. Our choice of controls is guided by data availability and the literature on trade protection.<sup>19</sup>We maintain a consistent sample of 116 sectors for which data is available for all our controls. The results are reported in Table 7. Allowing for the fact that trade protection might be aimed at protecting sectors with more employees, column (1) includes the log of total employees interacted with year fixed effects. In column (2) we repeat the same exercise with the log of total imports, motivated by the possibility that import-dependent sectors might be less protected. In both cases, the coefficient on crony interaction remains stable and statistically significant at 5% level.

To the extent that our finding might be driven by initial levels of trade protection, column (3) includes the log of average tariff rate. While its interactions with year fixed effects have considerable explanatory power, our coefficient of interest remains positive and highly significant at 1% level. Next, we control for the intensity of non-tariff protection, as measured by the average number of NTM chapters applied. This builds on the idea that the intensity of protection is higher if a sector is subjected to NTMs from different chapters. The interactions are highly predictive of the cumulative increase in NTMs. Although this weakens our result

<sup>19</sup>Sector level data on key variables is extremely patchy for most North African states.

in column (4) we still get a positive coefficient that is significant at 10% level. Column (5) imposes a more stringent test by including all of the above controls. Still, the crony effect survives: the coefficient on crony interaction remains statistically significant at 10% level. The crony effect also survives when we replace our measure of treatment intensity with a binary treatment indicator (Online Appendix, Table A8).

*Varying the cut-off.* So far our results are based on taking 2004 as the cut-off year, given that the EU agreement was implemented in that year. Rather than taking this for granted we examine whether the underlying patterns in the data support our use of 2004 as the cut-off year. Following Nunn (2011) we estimate a fully flexible specification where, instead of interacting  $Cronyn_i$  with the binary indicator,  $I_t^{Post}$ , we interact crony count with each of the year fixed effects:

$$y_{it} = \sum_{j=2002}^{2011} \beta_j Cronyn_i \cdot I_t^j + \Phi_j \lambda_{it} + \sum_s \theta_s I_i^s + \sum_{j=2002}^{2011} \rho_j I_t^j + \varepsilon_{it},$$

The estimated  $\beta_j$ s in this equation capture the impact of cronyism on the cumulative growth of NTMs in each successive year. As before we include sector and year fixed effects, as well as sector time trends. We expect our coefficient of interest to be larger in magnitude and statistically significant only after 2004 when the EU agreement was put into effect. The estimated  $\beta$  coefficients along with their 95 percent confidence intervals are plotted in Figure 5. The resulting patterns are entirely consistent with our story. The coefficient on crony interaction is negative and statistically insignificant before 2005. However, there is a discernible discontinuity in 2005, a year after the EU agreement, when the coefficient becomes positive. The  $\beta$  coefficient remains positive and statistically significant at 5 percent level during the 2006-2010 period.

*Placebo tests.* We next conduct a placebo exercise to determine whether the cronyism has any effect on our outcome of interest in the pre-period. For this we restrict the estimation to the pre-period (2001-2004) and redefine the post indicator,  $I_t^{Post}$ , as taking the value of one in years 2003 and 2004 (o, otherwise). This reduces our sample to 446 observations, with a maximum of four observations per group.<sup>20</sup> All specifications include the available controls besides the usual sector and year fixed effects, as well as sector time trends. We expect the coefficient on crony interaction ( $\beta$ ) to be close to zero and statistically significant, since cronyism should not influence sectoral exposure to NTMs before the EU agreement. The results are presented in Table 8. Consistent with our prior the coefficient on crony

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<sup>20</sup>Overall sample size still consists of 119 sectors.

interaction is negative and statistically insignificant regardless of whether we use a measure of treatment intensity (cols. 1 and 3) or a binary treatment indicator (cols. 2 and 4). The same result holds if we were to replace our dependent variable with number of new NTMs introduced (*NTM new*).<sup>21</sup> We take this as evidence that the emphasized effect of cronyism is absent before the EU agreement came into effect. This supports our DID design.

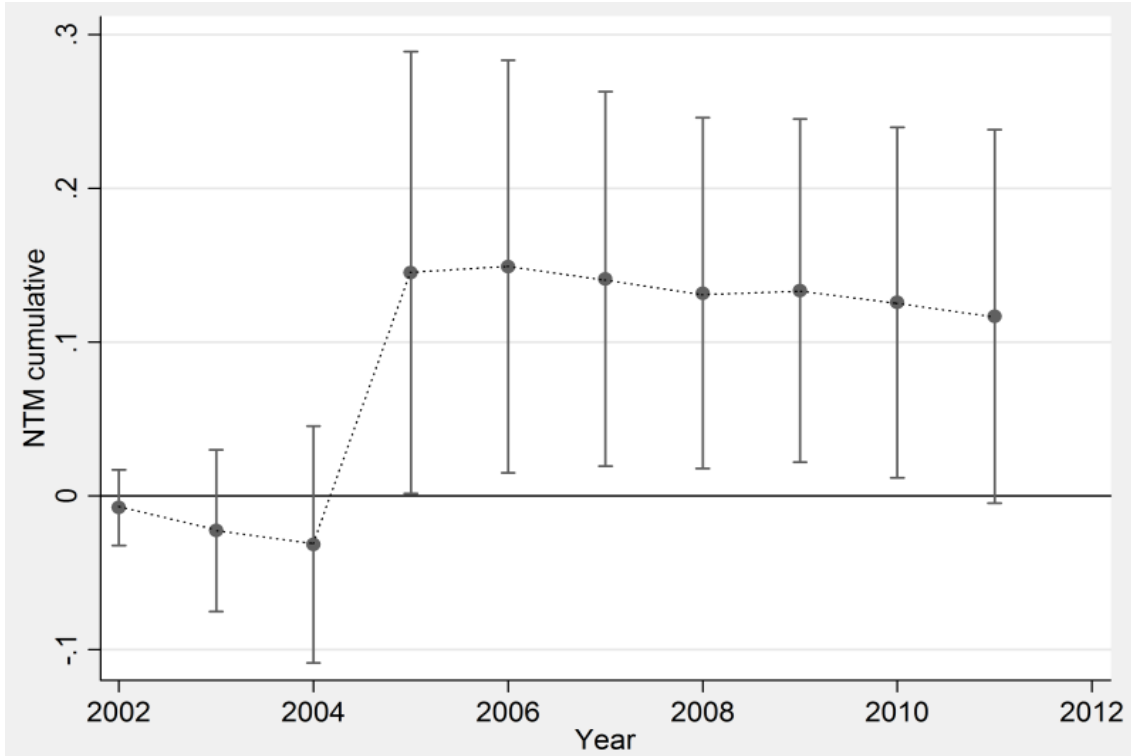


Figure 5: Flexible Estimates of the Relationship between Cronyism and Non-tariff Protection

*Alternative definition of cronies.* We have thus far used a broader definition of cronies that include *confidants*, *politicians*, and *associates*. However, using a narrower definition of cronies that includes only *politicians* preserves our central finding. In fact, the estimates reported in Online Appendix show that our results become slightly stronger when using a narrow definition of cronies.

*Restricted sample with tariff cuts.* One concern with our results is that our findings may be influenced by the inclusion of sectors that did not witness tariff cuts in wake of the EU agreement. To ensure that this does not bias our results we next replicate our estimates for the restricted sample of sectors that faced a tariff cut after the EU agreement. The

<sup>21</sup>A related exercise is to bring the treatment period forward. If the *Post* is redefined to include the year 2000 and beyond, the coefficients on both the crony and crony count interactions lose their significance completely.

accompanying results are reported in Online Appendix (Table A9).

#### 4.2.5 *DID with IV*

Despite delivering a consistent pattern of results, our initial crony treatment might still leave room for skepticism. Although it is highly unlikely that cronies that entered far back in time could have predicted a future shift in trade policy that was mainly the result of high geo-politics, it is still possible that part of the process may be endogenous. Apart from the endogenous sorting of cronies in sectors that later received greater NTM protection, our results can also be confounded by omitted variables. These could be time-varying sectoral characteristics that are either unobserved or suffer from missing data but which could influence both initial crony presence and subsequent exposure to NTMs. Measurement error could serve as an additional concern. To address these issues, we follow Waldinger (2012) in combining a DID framework with IV methods.

In this sub-section we propose two plausible instruments that could provide an exogenous source of variation for sectoral exposure to cronies, our measure of treatment intensity. Our first instrument, *neighbour-crony ratio*, is a measure of the presence of crony relatives in neighbouring sectors. We define neighbour in a narrow technical sense, whereby all sub-groups within a 3-digit sector are treated as neighbours. Precisely, the instrument is constructed as the total number of crony relatives per neighbouring sector.<sup>22</sup> To construct the instrument we use the same time window as for the initial crony treatment, i.e., 1996-98.

The intuition for our instrument comes from the entry decision of cronies, which can arguably be modelled through clan networks. Cronies in North Africa tend to build broad clusters and might favour operating in sectors that are already populated by relatives. Prior presence of relatives can benefit cronies in several ways. It allows them to build on existing strengths, such as accumulated family knowledge of the sector, and might deliver other positive externalities. For example, clustering in sectors where other clan members are active can increase cronies' bargaining power and help to provide insurance against policy uncertainty, which remains a perennial concern for Egyptian manufactures. If, for whatever reason, cronies were to prefer operating in sectors already inhabited by relatives, we should expect to have a negative association between our instrument and crony treatment ( $Cronyn_i$ ). This would imply that cronies will tend to avoid sectors whose neighbourhoods have greater relatives per sector. In other words, they would rather be in one of the neighbouring sectors than in the

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<sup>22</sup>This could be expressed as: total number of crony relatives in neighbouring 3-digit sectors/total number of neighbouring 3-digit sectors.



sector concerned.

Instrument validity requires that the *neighbour-crony ratio* only predicts which sectors cronies enter but not NTM incidence. This seems plausible in our case, since even if one were to admit that the entry of cronies is driven by expectations of future trade protection this should only affect NTM incidence in neighbouring sectors. Clearly, this identification strategy rests on the assumption that NTMs in a given sector are not determined by protection levels in neighbouring sectors. We provide confirmatory evidence to this effect in the Online Appendix. The exclusion restriction can be checked more generally by including our instrument as an additional control in the main specification. Doing so results in a statistically insignificant coefficient, which suggests that our instrument does not directly affect NTM activity in a given sector.

Our second instrument deploys a larger notion of neighbourhood, in that it draws a parallel between sectoral exposure to cronyism in Egypt with that of Tunisia, a key North African neighbour. After the Arab Spring both Egypt and Tunisia were held out as comparable cases of crony capitalism, where economic and political power began to overlap under their respective leaders at the time, Mubarak and Ben Ali. We argue that there are common drivers of sectorial variation in crony presence across the region that emanate from shared characteristics of business-state relationship. Cronies tend to proliferate in sectors defined by high barriers to entry (exclusive licenses, entry restrictions), preferential access to finance, prevalence of subsidies (food, energy), and opportunities to derive quick profits (low skill/technology and high profit margins), among others. There is plenty of qualitative evidence to suggest that Egypt and Tunisia have a similar sectoral exposure to cronyism despite the fact that cronies in the two countries are not directly related.

In light of this, we propose that information on whether or not a sector is exposed to cronyism in Tunisia provides an exogenous source of variation for crony treatment in Egypt ( $Cronyn_i$ ). To do so, we define a binary indicator,  $CronyTunisia$ , which is equal to one for sectors where a Tunisian crony was active in the same period under Ben Ali. We use this as an instrument for  $Cronyn_i$ . This requires, however, a parallel attempt at compiling the database on Tunisian cronies active under Ben Ali's regime. Details for this intensive data exercise are separately described in the Online Appendix. As before, we require  $CronyTunisia$  to be correlated with the treatment variable but lacking direct explanatory power for variation in NTM activity. Indeed, when included as a covariate in our baseline specification,  $CronyTunisia$  lacks any predictive power with regards to the dependent variable. Reassured by this, we proceed towards re-estimating our baseline DID specification using these instrumental variables. The first-stage regressions take the following general form:

$$Cronyn_i.I_t^{Post} = \gamma_i + \gamma_2 neighbour_i.I_t^{Post} + \Phi_j \lambda_{it} + \sum_s \theta_s I_i^s + \sum_{j=2002} \rho_j I_t^j + \mu_{it},$$

where  $neighbour_i$  signifies one of the two neighbourhood instruments and enters in the model as an interaction with the post indicator; other variables are defined as before. We will use the two instruments, *neighbour-crony ratio* and *CronyTunisia*, separately as well as jointly, and assess instrument validity using tests for overidentifying restrictions. We estimate the IV specifications using GMM methods with robust standard errors, given that GMM estimators are generally more efficient than 2SLS in the presence of heteroskedasticity (Baum, Schaffer and Stillman, 2003). The IV estimates are presented in Table 9. Given data limitations, the sample size for specifications using the first instrument reduces to 85 sectors.

To ensure that our main finding remains intact on this reduced sample, column (1) replicates the baseline specification and shows that the treatment-post interaction continues to turn up as a positive and significant predictor of *NTM\_cum*. Column (2) provides the IV estimates of this specification using our first instrument, *neighbour-crony ratio*. As expected, the instrument has a large, negative and statistically significant impact on the crony-post interaction. The first-stage F-Statistic is 81.38, well beyond the conventional threshold of 10. Importantly, the coefficient on our main variable of interest,  $Cronyn_i.I_t^{Post}$ , comes out as positive and significant at 1 percent level. The underidentification test, based on the Kleibergen-Paap LM statistic, supports the relevance of our instrument. Similarly, the F-statistics for weak identification tests (Craig Donald and Kleibergen Paap rk) comfortably surpass all the relevant critical values.

In column (3) we re-estimate the baseline specification using our second instrument, *CronyTunisia*. As before, the instrument is a strong predictor of the exposure of Egyptian sectors to cronyism in late 1990s. The interactive term,  $CronyTunisia.I_t^{Post}$ , enters the estimated model with a positive and statistically significant coefficient. Our next IV specification in column (4) exploits the exogenous variation in both of our instruments to predict the crony interaction. Reassuringly, both instruments turn up as significant in First-stage regressions, and the coefficient on crony-post interaction remains positive and significant. The Sargan-Hansen test of overidentifying restrictions, and the battery of weak identification tests, support the validity of our instrument set. These results also survive the inclusion of our standard control variables in column (5). Collectively, these findings further reinforce the evidence on cronyism and trade protection that we have presented so far.

## 5 Conclusion

This article has examined the extent to which politically connected businessmen in late-Mubarak Egypt were able to tilt non-tariff measures in their favour. To do so, we combine information from the WITS database (World Bank, 2013) on the timing of NTM introductions with a novel dataset on crony activity in all manufacturing sectors, which allows us to identify when cronies enter a specific sectors. Using conditional logistic and GMM models to identify we identify a solid association between crony entry and subsequent introduction and intensification of NTM protection. On average, sectors in which cronies enter in  $t-1$  are 50 percent more likely to witness the introduction of an NTM than non-crony sectors. Furthermore, crony entry is also associated with an intensification of NTM protection, leading to a 6 percent average increase in the number of products subject to an NTM, conditional on an NTM having been introduced.

We then corroborate the link between crony entry and NTM protection by conducting a difference-in-difference analysis which exploits the introduction of the EU-Egypt trade agreement in 2004 as an exogenous shock to the Egyptian trade regime. This analysis demonstrates that cronies who had entered a manufacturing sectors by 1998 – six years prior to the trade agreement – received on average 15% higher compensation in the form of NTMs for the ensuing cut in tariff than non-crony sectors. To address any remaining selection issues, we use two instruments for the presence of cronies by 1998: the share of other cronies in neighbouring sectors and the sectoral distribution of politically connected entrepreneurs in Tunisia. Both are highly predictive of crony presence as cronies seek to avoid too much crony competition in the same sectoral neighbourhood and the nature of cronyism in the region – agglomerating in sectors with high barriers to entry – makes the Tunisian pattern of crony activity predictive of sectoral presence of cronies in Egypt.

Our findings contribute to ongoing debates about the determinants of trade protection. Having focused predominantly on Western economies and tariffs, our analysis is one of the first ones to address the determinants of NTMs in a developing economy, highlighting the potential for political capture of trade policy by crony entrepreneurs in a context characterised by limited rule of law and the absence of democratic accountability. We also contribute to the literature on cronyism, which has thus far chiefly been concerned by the effects political connections have on crony entrepreneurs themselves. Our study, in turn, breaks new ground in that we demonstrate how policies themselves can be endogenous to crony influence. Finally, this study represents a detailed empirical case study of elite co-optation in an authoritarian political system, detailing at the micro level how policies can be used to tie economic elites

to the regime.

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Table 4: NTM Introduction and Crony Activity

|                         | (1)                    | (2)                    | (3)                    | (4)                    | (5)                   |
|-------------------------|------------------------|------------------------|------------------------|------------------------|-----------------------|
|                         | NTM Intro              | NTM Intro              | NTM Intro              | NTM Intro              | NTM Intro: First-ever |
| Crony presence $t_{-1}$ | 1.251***<br>(0.395)    | 1.202***<br>(0.421)    | 1.165***<br>(0.430)    | 1.310***<br>(0.445)    | 16.86***<br>(1.460)   |
| Imports $t_{-1}$        |                        | -0.262<br>(0.195)      | -0.267<br>(0.184)      | -0.291<br>(0.198)      | -0.480<br>(0.566)     |
| Exports $t_{-1}$        |                        |                        | -0.0304<br>(0.158)     | -0.0238<br>(0.159)     | 0.342<br>(0.399)      |
| Tariffs $t_{-1}$        |                        |                        |                        | -0.481<br>(0.313)      | -5.843***<br>(1.307)  |
| Time spell              | 0.684**<br>(0.286)     | 0.593**<br>(0.262)     | 0.699**<br>(0.288)     | 0.761**<br>(0.304)     |                       |
| Time spell <sup>2</sup> | -0.262**<br>(0.116)    | -0.257**<br>(0.110)    | -0.280**<br>(0.114)    | -0.289**<br>(0.120)    |                       |
| Time spell <sup>3</sup> | 0.0312***<br>(0.00949) | 0.0311***<br>(0.00920) | 0.0318***<br>(0.00948) | 0.0316***<br>(0.00989) |                       |
| Prefail                 | -0.0631***<br>(0.0183) | -0.0804***<br>(0.0281) | -0.0723*<br>(0.0394)   | -0.117**<br>(0.0527)   |                       |
| Pseudo R-sq             | 0.321                  | 0.319                  | 0.285                  | 0.296                  | 0.554                 |
| Sectors                 | 75                     | 73                     | 66                     | 66                     | 50                    |
| NxT                     | 1125                   | 1011                   | 892                    | 892                    | 307                   |

Conditional logistic fixed effects regression. Cluster-robust standard errors in parentheses.

Crony variable based on broad definition of cronies.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table 5: NTM Density and Crony Activity

|                         | (1)                     | (2)                     | (3)                   |
|-------------------------|-------------------------|-------------------------|-----------------------|
|                         | NTM share               | NTM2 share              | NTM chapter           |
| Crony presence $t_{-1}$ | 0.0661***<br>(0.0256)   | 0.0675**<br>(0.0264)    | 0.0462*<br>(0.0281)   |
| Imports $t_{-1}$        | -0.0171***<br>(0.00594) | -0.0174***<br>(0.00602) | -0.0177*<br>(0.00973) |
| Exports $t_{-1}$        | 0.00832**<br>(0.00368)  | 0.00823**<br>(0.00367)  | 0.000656<br>(0.00666) |
| MFN $t_{-1}$            | 0.00519<br>(0.00671)    | 0.00485<br>(0.00671)    | -0.00981<br>(0.00927) |
| NxT                     | 653                     | 646                     | 591                   |
| Sectors                 | 75                      | 75                      | 75                    |
| Sector FEs              | Yes                     | Yes                     | Yes                   |
| Year FEs                | Yes                     | Yes                     | Yes                   |
| Lags of DV              | 3                       | 3                       | 5                     |
| AR(2)                   | 0.639                   | 0.877                   | 0.345                 |

System GMM estimates with sector and year fixed effects and cluster-robust standard errors. Crony variable based on broad definition of cronies. Sample restricted to sectors with NTMs. Reported numbers for AR(2) test are p-values.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table 6: Results for Difference-in-Difference Model

|                            | (1)                 | (2)                 | (3)                 | (4)                 | (5)                 | (6)                  |
|----------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|----------------------|
|                            | NTM cum             | NTM cum             | NTM new             | NTM new             | NTM cum             | NTM new              |
| Initial crony count x Post | 0.153**<br>(0.0663) | 0.143**<br>(0.0652) | 0.148**<br>(0.0632) | 0.174**<br>(0.0678) | 0.132**<br>(0.0613) | 0.0725**<br>(0.0288) |
| Two-period                 | No                  | No                  | No                  | No                  | Yes                 | Yes                  |
| Controls                   | No                  | Yes                 | No                  | Yes                 | Yes                 | Yes                  |
| Sector trends              | Yes                 | Yes                 | Yes                 | Yes                 | Yes                 | Yes                  |
| Adj R-sq                   | 0.745               | 0.767               | 0.422               | 0.421               | 0.851               | 0.568                |
| Sectors                    | 119                 | 119                 | 119                 | 119                 | 119                 | 119                  |
| NxT                        | 1309                | 1102                | 1309                | 1102                | 238                 | 238                  |

Observations are at the sector-year level. The dependent variable is either the cumulative number of NTMs (NTM cum) or number of new NTMs applied in a given sector-year (NTM new). All regressions include year and sector fixed effects. Coefficients are reported with robust standard errors, clustered at the sector level, in parentheses. The estimation period is 2001-2011. Post dummy is equal to 1 if year is greater than 2004 and 0, otherwise. Controls include total imports, exports and MFN tariffs, all measured in natural log and weighted by number of products. Crony variable is based on broad definition of cronies.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table 7: Robustness Tests for DID: NTM cumulative

|                            | (1)                 | (2)                 | (3)                  | (4)                | (5)                |
|----------------------------|---------------------|---------------------|----------------------|--------------------|--------------------|
| Initial crony count x Post | 0.133**<br>(0.0645) | 0.147**<br>(0.0664) | 0.190***<br>(0.0634) | 0.108*<br>(0.0638) | 0.111*<br>(0.0621) |
| Sector x Time              | Yes                 | Yes                 | Yes                  | Yes                | Yes                |
| Controls (x Year FE):      |                     |                     |                      |                    |                    |
| Employees                  | Yes                 | No                  | No                   | No                 | No                 |
| Imports                    | No                  | Yes                 | No                   | No                 | No                 |
| Tariffs                    | No                  | No                  | Yes                  | No                 | No                 |
| NTM chap                   | No                  | No                  | No                   | Yes                | No                 |
| Full set                   | No                  | No                  | No                   | No                 | Yes                |
| Adj R-sq                   | 0.762               | 0.754               | 0.763                | 0.766              | 0.790              |
| Sectors                    | 116                 | 116                 | 116                  | 116                | 116                |
| NxT                        | 1245                | 1245                | 1245                 | 1245               | 1245               |

Observations are at the sector-year level. The dependent variable is the cumulative number of NTMs (NTM cum) applied in a given sector-year. All regressions include year and sector fixed effects. Coefficients are reported with robust standard errors, clustered at the sector level, in parentheses. The estimation period is 2001-2011. Post dummy is equal to 1 if year is greater than 2004 and 0, otherwise. All controls are measured in natural log and averaged over the period, 1996-98. Crony variable is based on broad definition of cronies.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table 8: Placebo Tests

|                            | (1)                   | (2)                 | (3)                 | (4)                 |
|----------------------------|-----------------------|---------------------|---------------------|---------------------|
|                            | NTM cum               | NTM cum             | NTM new             | NTM new             |
| Initial crony count x Post | -0.00696<br>(0.00811) |                     | -0.0105<br>(0.0555) |                     |
| Initial crony dummy x Post |                       | -0.0230<br>(0.0235) |                     | -0.0129<br>(0.0891) |
| Controls                   | Yes                   | Yes                 | Yes                 | Yes                 |
| Sector x Time              | Yes                   | Yes                 | Yes                 | Yes                 |
| Adj R-sq                   | 0.0991                | 0.103               | 0.134               | 0.134               |
| Sectors                    | 119                   | 119                 | 119                 | 119                 |
| NxT                        | 446                   | 446                 | 446                 | 446                 |

Observations are at the sector-year level. The dependent variable is the cumulative number of NTMs (NTM cum) applied in a given sector-year. All regressions include year and sector fixed effects. Coefficients are reported with robust standard errors, clustered at the sector level, in parentheses. The estimation period is 2001-2004. The definition of Post dummy varies across columns. Controls include total imports, exports and MFN tariffs, all measured in natural log and weighted by number of products. Crony variable is based on broad definition of cronies.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table 9: Difference-in-Difference Regressions with IV

|  | (1)                | (2)                 | (3)                | (4)                  | (5)                 |
|--|--------------------|---------------------|--------------------|----------------------|---------------------|
| Dep. Variable: Cumulative number of NTMs applied |                    |                     |                    |                      |                     |
| Initial crony count x Post                       | 0.125**<br>(0.052) | 0.200**<br>(0.102)  | 0.261**<br>(0.126) | 0.247***<br>(0.0954) | 0.192**<br>(0.0870) |
| <i>First stage</i>                               |                    |                     |                    |                      |                     |
| Neighbour-crony ratio                            |                    | -.709***<br>(0.079) |                    | -.734***<br>(0.080)  | -.859***<br>(0.082) |
| Crony presence in Tunisia                        |                    |                     | .632***<br>(0.114) | .316***<br>(0.118)   | .348***<br>(0.120)  |
| First stage F-statistic                          |                    | 81.38               | 30.29              | 41.92                | 54.87               |
| Kleibergen-Paap LM (p-value)                     |                    | 0.000               | 0.000              | 0.000                | 0.000               |
| Kleibergen-Paap Wald-statistic                   |                    | 81.382              | 30.289             | 41.992               | 54.871              |
| Stock-Yogo Critical Values:                      |                    |                     |                    |                      |                     |
| (10 percent)                                     |                    | 16.38               | 16.38              | 19.93                | 19.93               |
| (25 percent)                                     |                    | 5.53                | 5.53               | 7.25                 | 7.25                |
| Hansen-J test (p-value)                          |                    |                     |                    | 0.21                 | 0.43                |
| Sector x Time                                    | Yes                | Yes                 | Yes                | Yes                  | Yes                 |
| Controls   | Yes                | No                  | No                 | No                   | Yes                 |
| Adj. R-sq  | 0.776              | 0.744               | 0.715              | 0.744                | 0.760               |
| Sectors  | 85                 | 85                  | 119                | 85                   | 85                  |
| NxT  | 783                | 935                 | 1309               | 935                  | 783                 |

Observations are at the sector-year level. The dependent variable is the cumulative number of NTMs applied in a given sector-year. All regressions include year and sector fixed effects. Coefficients are reported with robust standard errors, clustered at the sector level, in parentheses. The estimation period is 2001-2011. Post dummy is equal to 1 if year is greater than 2004 and 0, otherwise. Controls include imports, exports, and tariff rates, all weighted by products in a given sector-year and expressed in natural log. Crony variable is based on broad definition of cronies.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$