

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

Ferdinand Eibl<sup>†</sup> and Adeel Malik<sup>‡</sup>

## Abstract

This paper provides one of the first systematic empirical assessments of the impact of political connections on trade protection. To do this, we exploit a major episode of trade liberalization in Egypt that was triggered by an EU Association Agreement in 2004, which resulted in an across-the-board reduction of tariff barriers and a subsequent increase in non-tariff measures (NTMs). Leveraging this relatively exogenous EU-induced trade policy shock and combining it with a unique compilation of sector-level data on NTMs and politically connected businesses in Mubarak-era Egypt, our difference-in-differences regression analysis shows that sectors with prior exposure to politically connected businesses witnessed a systematically higher introduction of NTMs in the aftermath of the EU Agreement. Our results indicate that political cronies were

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<sup>†</sup> King’s College London.

<sup>‡</sup>Corresponding Author. Oxford Department of International Development, 3 Mansfield Road, Oxford OX1 3TB, United Kingdom. Email: adeel.malik@qeh.ox.ac.uk; Telephone: +44-1865-618508.

primarily compensated through technical barriers to trade that require administrative oversight and are more susceptible to political abuse.

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# 1 Introduction

Partial liberalization has been a ubiquitous feature of economic reform in developing countries where, in the wake of trade liberalization in the 1990s, one form of protection was typically replaced by another. This “partial reform syndrome”, as Van der Walle (2001) describes it, is amply manifested in the Middle East where rapid tariff reductions in the aftermath of trade liberalization were accompanied by a growing reliance on non-tariff measures (NTMs) (Chauffour, 2011; Augier et al., 2012). Such partial reform is rooted in political economy, since externally imposed trade reforms are often brokered to suit the interests of political incumbents who rely on policy-induced rents to structure elite relationships and sustain ruling coalitions.

To what extent is such trade policy substitution, reflected in the growing prominence of non-tariff protection, influenced by the presence of politically connected actors in the economy? Does NTM usage systematically differ across politically connected and unconnected sectors? Are some NTMs more susceptible to political capture than others? We explore these questions in the context of Egypt, which underwent a period of large-scale trade liberalization in the wake of a free trade agreement concluded with the European Union in 2004. This was a dramatic trade policy shock that entailed a nearly universal reduction in tariff barriers across Egyptian manufacturing sectors. However, trade liberalization was partial in a two-fold sense: the EU-induced tariff cuts were followed a year later by Egypt’s largest wave of NTM introductions (see Figure 1); this increase, in turn, affected sectors unequally with some seeing their level of non-tariff protection heightened more than others. We capitalise on this policy shock to assess the extent to which cronies were better able to lobby for compensatory protection in the form of NTMs. We thereby provide the first empirical illustration of the politics of partial liberalization.

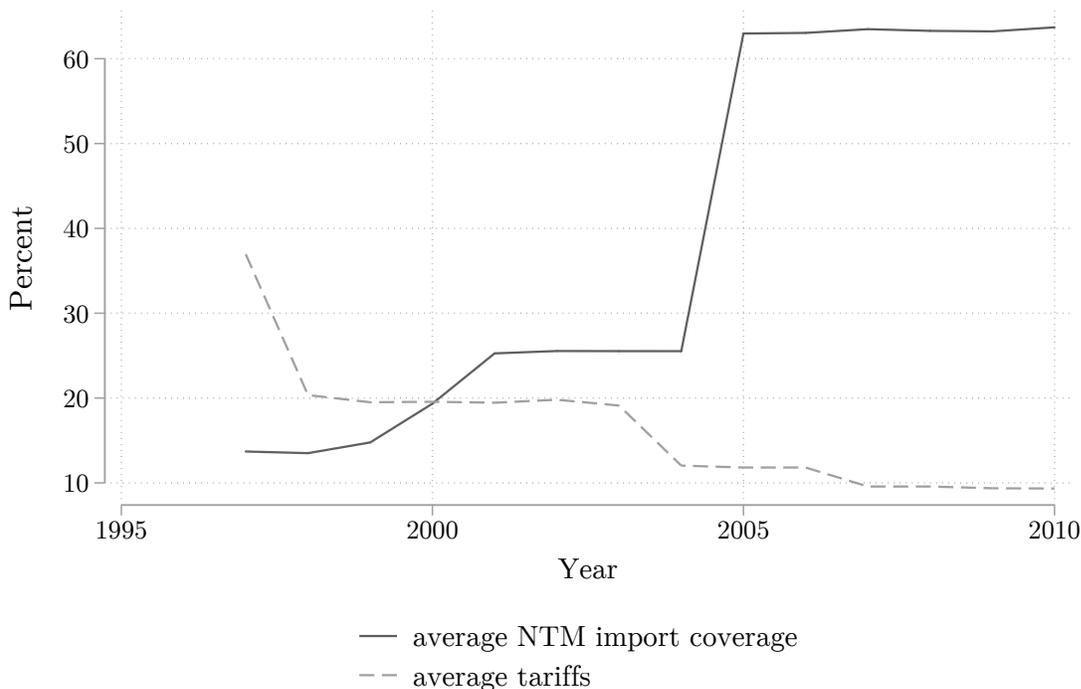


Figure 1: Evolution of trade protection in Egypt, 1997-2010

To explore this, we make use of the recently released WITS database (World Bank, 2013) which provides by far the most extensive information on the nature and introduction of NTMs over time and across sectors. We combine this with an original dataset on crony capitalists in the late-Mubarak period that we were able to compile at a hitherto unprecedented level of detail. This was enabled by the Egyptian uprising in 2011 and the associated exposure of the entrenched crony networks. We begin by exploring the within-sector variation of NTMs over time and 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  $t+1$ . 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.

Motivated by these strong patterns of association, we conduct a difference-in-differences regression analysis that leverages the across the board tariff-reduction triggered by the EU-

Egypt Free Trade Agreement in 2004. We argue that the EU agreement was determined outside Egypt’s domestic political arena and was an outcome of high-level geo-political concerns that linked trade and security in the post-9/11 period. Our empirical strategy exploits two important sources of variation: differences in the extent of prior sectoral exposure to politically connected businesses and temporal variation in NTM incidence arising out of the EU-induced tariff cuts. We demonstrate that sectors with a greater prior exposure to politically connected businesses witnessed a significantly higher increase in NTM protection after the EU agreement than non-crony sectors. Our placebo tests suggest that crony presence had no effect on the burden of NTM protection prior to the EU agreement. Importantly, prior to this policy shock, crony and non-crony sectors did not follow a differential trajectory in terms of both NTM incidence and tariff levels.

Our empirical strategy recognizes potential identification concerns that typically arise in such analyses. One concern is that cronies could have possessed insider knowledge and entered into sectors in anticipation of an assured NTM introduction. Although this was unlikely given the high levels of policy uncertainty and centralized decisionmaking in Egypt, we show that prior trade protection, measured as lagged tariffs and NTM incidence, have no predictive power for crony entry in a sector. Still, by treating only sectors that were populated by cronies six years prior to the conclusion of the agreement as “crony”, we alleviate concerns that these entrepreneurs could have selected into sectors knowing that NTM protection would follow. Our results survive even after bringing the crony treatment forward to 1990, nearly 15 years before the EU agreement came into force.

Crony presence could still, however, be correlated with initial sector-level characteristics that determine the potential for NTM introductions in the future. To address this, we control for several confounding factors, including the level of tariffs and imports. Apart from including the interactions of these initial sectoral characteristics with year fixed effects, we also probe the robustness of our findings to a more extended set of industry characteristics

from UNIDO. All our specifications control for sector and year fixed effects. The former account for any unobserved heterogeneity that is sector-specific and time-invariant, such as the possibility that some sectors are both inherently more prone to crony influence (e.g. tobacco, textile, and motor vehicles) and NTM introductions. Finally, we include sector-by-year interactions to account for any broad sectoral time trends operating at the ISIC-2 level. Our main findings hold up to a variety of modifications and robustness tests, which include using alternative definitions of cronies, varying the cut-off date for defining pre- and post-periods, restricting the sample size to sectors that witnessed a major tariff cut, and deploying different estimation strategies.

Finally, to rule out remaining concerns of endogeneity, we also instrument for the presence of cronies by 1998 with two plausibly exogenous predictors: the share of other cronies in neighbouring sectors, and crony sectors in the Tunisian economy. We argue that the former measure is a valid instrument as cronies might prefer sectoral neighbourhoods that are already densely populated by cronies, since this would afford them greater bargaining power and hence protection from policy uncertainty. 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. Results obtained from this instrumentation 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. Taken together, while we are unable to address all possible identification concerns, our results are highly robust and consistent.

Our study breaks new ground by investigating the political determinants of NTM protection, which has now emerged as the most dominant form of trade protection globally. NTMs are complicated legal texts that prescribe standards and regulations, and set out pro-

cedures for assessing conformity with these technical regulations.<sup>1</sup> Although NTMs can be imposed without an explicit protectionist intent to meet environmental, health, and safety considerations, their possible impact on trade is not always innocuous.<sup>2</sup> With the generalized decline in tariffs globally, the relative contribution of NTMs to overall trade restrictiveness has increased. By some estimates, NTMs are almost twice as restrictive to trade as tariffs (Kee, Nicita and Olarreaga, 2009). This is especially true for developing countries where the average costs of NTMs are typically higher and the capacity to enforce these regulations is significantly weaker (World Bank, 2018; Essaji, 2008).

The effects of NTMs can thus be shaped by the type of NTMs imposed and the manner in which they are applied.<sup>3</sup> The disjunction between *de jure* trade regime and *de facto* practice means that even when NTMs are introduced without explicit discriminatory intent they can have a discernible impact on trade. In developing countries where implementation capacity is generally weak, governments “show little (or no) compliance with their own policies”, which is manifested in “very large and firm-specific deviations in reported compliance times” (Hallward-Driemeier and Pritchett, 2015). This holds special relevance in the trade policy arena where verification and assessment of complex non-tariff regulations are likely to raise the costs of compliance for politically unconnected firms. Indeed, our results are primarily driven by technical barriers to trade and pre-shipment inspections, the two NTM sub-types that require bureaucratic oversight and are more susceptible to political abuse.

This paper speaks to a number of different literatures. It, first, significantly enhances our understanding of the politics of trade protection. Prior theoretical work has sought to emphasize the role of special interest groups in shaping the trade policy choices in a

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<sup>1</sup>In the parlance of UNCTAD, non-tariff measures are “policy measures - other than ordinary custom tariffs - that can potentially have an economic effect on international trade in goods, changing quantities traded, or prices or both” (WTO, 2012).

<sup>2</sup>There is a nuanced difference between non-tariff *measures* and non-tariff *barriers* (NTBs). Unlike NTBs non-tariff measures are a more neutral concept as they can, in principle, facilitate trade.

<sup>3</sup>As a recent WTO report observes, “the effects of NTMs are dependent not only on regulatory frameworks but also on their implementation procedures and administrative mechanisms” (WTO, 2012).

representative democracy (Grossman and Helpman, 1994). While the significant rise of NTMs in both developed and developing countries has been recognized (Hoekman and Nicita, 2011; Grilli, 1988; Kee, Nicita and Olarreaga, 2009), the literature on the determinants of NTMs has almost singularly focussed on Western economies (Ray, 1981*b,a*; Ray and Marvel, 1984; Esfahani, 2005; Gawande and Bandyopadhyay, 2000; Azrak and Wynne, 1995; Treffer, 1993). Perhaps the closest empirical exercise is offered by Bown and Tovar (2011) who show how antidumping and safeguard protection substituted for India's trade liberalization in early 1990s. However, in the absence of data on political connections, they could only probe the role of interest group activity by differentiating between organized and unorganized sectors.

Our contribution is to compile a unique database on political connections in Egypt and highlight the political selectiveness of this substitution process in an autocracy. 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 challenge 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). Our research also closely parallels recent work on crony capitalism in Egypt (Diwan, Keefer and Schiffbauer, 2016) and Tunisia (Rijkers, Freund and Nucifora, 2017). While these studies have analysed the effect of preferential treatment on crony companies and their performance, none of these studies directly focus on trade protection.<sup>4</sup> This article thus considerably expands the literature on cronyism.

Third, the paper contributes to broader debates about the political economy of reform. We provide a concrete illustration in the arena of trade policy and uncover in empirical detail the political underpinnings of partial economic reform. 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 Middle Eastern economies that derive relatively fewer rents from natural resources but have extensive distributional commitments. For these regimes, regulatory rents are important for sustaining an authoritarian political order, and serve as a key commitment device between economic elites and the regime.

The rest of this 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.

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<sup>4</sup>Diwan et al. (2016) furnish some indirect evidence on trade protection by showing that profits of crony firms are higher than non-cronies in sectors that are protected by NTMs.

## 2 Background: Cronyism and NTMs in Egypt

### 2.1 CRONYISM IN EGYPT

Business-state relations in Egypt have typically been defined as operating through networks of privilege that allow connected businesses to stake their claim on the most lucrative parts of economy (Sfakianakis, 2004; Heydemann, 2004). In the late Mubarak era, the rise of Egyptian crony capitalists was intimately linked with Gamal Mubarak's ascendancy in the regime's ruling party, the National Democratic Party (NDP). 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 provides an overview of 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 in the market. The most notorious example of market domination is Ahmed Ezz, whose Ezz Steel Mills came to dominate the Egyptian steel market (Chekir and Diwan, 2014; Selim, 2006). 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 detergents, Ibrahim Kamel's Kato Group dominated the market, supplying half of the country's hotels with his products. 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 families reaped enormous benefits from the growing demand for cars by Egypt's middle and upper classes.

[Table 1 here]

The economic fortunes of these dominant business players were built on the back of their growing political clout. They entered the electoral domain in vast numbers. In the 1990s, a law was passed to allow businessmen to run for elections even without joining a formal political party. Later, the National Democratic Party established a separate business wing to cultivate ties with leading entrepreneurs and facilitate their entry into electoral politics. Consequently, the parliamentary elections in 2000 brought many leading business figures to the electoral stage; they won 77 seats in total. In 2005 business candidates won 22 per cent of the parliamentary seats (Soliman, 2011, 147).

Fostering direct political links to the ruling party and government institutions, many of these businessmen held important political positions (see Table 2). Sallam was an NDP party member 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. According to the last president of the parliament, Fathi Sorour, Ezz's prominent position in parliament allowed him to mobilise large majorities in his favour (quoted in Kandil, 2010). Another group of oligarchs took on ministerial posts in the Nazif government: 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). Beyond the electoral domain, the nature of connections between business and politics took several forms. Some of them were confidants of the presidential family. Others co-invested with the Mubarak family in joint business ventures.

[Table 2 here]

## 2.2 THE EGYPT-EU TRADE AGREEMENT

Trade liberalization began in earnest in 1999, a few years after Egypt had become a member of the WTO in 1995. This was accompanied by a number of important economic and political developments during the period of 1999-2004, including the the 1999 Trade and Investment Framework Agreement (TIFA) between Egypt and the United States, which led to the formation of Qualified Industrial Zones (QIZs) in Egypt in December 2004.<sup>5</sup> In the same year, Egypt also signed a trade agreement with the European Union (EU), which proved to be a watershed moment in the country’s trade policy regime, resulting in the most comprehensive across the board tariff reductions seen so far. 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 percent reduction each year from 2004 to 2007. With this large-scale dismantling of tariffs, half of EU’s industrial exports to Egypt were to be liberalized by 2007.<sup>6</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 2004, reduced the number

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<sup>5</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>6</sup>Duties on industrial supplies, semi-manufacturing goods, and construction material were to be reduced by 10 percent in 2007 and 15 percent in each successive year till 2013.

of tariff bands to twelve. 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 percent of all sectors that experienced a tariff reduction in 2004 witnessed an increase in NTMs in 2005. The question we wish to ask is whether politically connected sectors witnessed systematically larger increases in NTMs after 2004.

The Egypt-EU trade agreement provides an ideal setting for our empirical enquiry. Firstly, economic relations with the EU carry immense significance for Egypt. The EU is Egypt's single largest trade partner, its main source of FDI, and its second largest donor after the United States. Secondly, the EU trade agreement was largely determined outside Egypt's domestic political domain.<sup>7</sup> The various trade pacts Egypt signed after 2001 were driven by the strategic external imperative that unfolded after 9/11. A recent review of Egypt's foreign trade treaties emphatically observes: "The Association Agreements and the hoped-for Euro-Mediterranean FTA were driven by geopolitics more than economics" (Adly, 2019). Echoing the same argument, Al-Khoury (2008, 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" (Al-Khoury, 2008, 4). This resulted in the US and EU signing a series of FTAs in key Middle Eastern states.<sup>8</sup> European trade agreements are especially significant in the North African context, which, due to its geographic proximity, is

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<sup>7</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 (Los Angeles Times, 2005). 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.

<sup>8</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.

part of Europe’s strategic neighbourhood.<sup>9</sup>

Against this backdrop, Egypt’s trade agreement with the 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 have long argued that major decisions on external trade relations are usually taken without substantive input from domestic business associations (see Cammett, 2007).<sup>10</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 only six months after the EU agreement came into force.

### 3 Data

To examine the effect of political connections on NTMs, we compile two original databases that provide rich sectoral information on the presence of politically connected businesses and NTMs.

*Political Connections.* To identify politically connected establishments we build a novel dataset on crony businesses in Egypt. This 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

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<sup>9</sup>As Al-Khouri (2008, 14) observes: “the 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>10</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.

reached or exceeded 100 million US\$ in the late 2000s.<sup>11</sup> Using information from the Orbis database (Bureau van Dijk, 2013), we added to this list all shareholders who had co-invested with these businesses 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. Following Faccio (2006), we identify different channels of political connections, based on whether any of the company's shareholders or top officers holds political office, or is closely related to top politicians or parties. In the Egyptian context, we first identify connected business actors who directly operated in the political domain 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). Next, we identify indirect political connections established through business relations with the Mubarak family, most notably Gamal Mubarak (*associates*); or strong personal ties with the Mubarak family, mostly through marital links or publicly known friendships (*confidants*).

Based on these political connections, we define crony businesses in a broad sense as all those who have known political connections, whether direct or indirect. 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. This constitutes around 6% of total sectors. In a third step, we collected information on the economic activity and date of foundation of all companies in which crony actors 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>12</sup> Companies for which we could not identify the date of establishment were dropped from the list.<sup>13</sup> Activity information was collected at the four-digit level of the International Standard Industrial Classification (ISIC,

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<sup>11</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>12</sup>These include the companies own websites and other online databases, such as *Kompass*.

<sup>13</sup>Overall, we are unable to identify dates of foundation for 16% of the firms. Classifying their respective sectors as treated does not alter our results.

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 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>14</sup> For our main analysis we use the broad definition of cronies. However, all our results are robust to using a narrower definition that treats cronies with only direct political connections.

Table 3 documents the proportion of ISIC-4 sub-sectors exposed to cronies. There is considerable variation in the extent to which individual sectors are exposed to cronyism. For example, while the office machinery sector has no crony presence, other sectors show exceedingly high concentration of cronies, such as the motor vehicles sector where 95 percent of the related ISIC4 sub-sectors are populated by cronies. On average, cronies were active in 57 percent of all manufacturing sub-sectors.

[Table 3 here]

*Non-tariff measures.* Our second key data input is information on NTMs, which is based on a more refined and structured classification of NTMs furnished by the WITS database (World Bank, 2013). The database documents NTMs at the six-digit product level and specifies the date when an NTM was introduced, allowing us to construct a panel and explore inter-temporal variation.<sup>15</sup> The WITS database also distinguishes between different NTM types, classifying them into 16 different chapters and two broad categories, technical and non-technical measures (the third category consists of export-related measures). Key NTM

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<sup>14</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>15</sup>Note that 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.

sub-types include Technical Barriers to Trade (TBT), Sanitary and Phytosanitary Measures (SPS), Pre-shipment Inspection (PSI), and Price Control Measures (PCMs).

While the database provides the most systematic documentation of NTMs so far, there is a potential concern that it might not capture information on NTMs that were introduced during the period of our investigation but removed prior to the year when such information was compiled. Reassuringly, the WTO provides fine-grained information on withdrawal of NTMs. During the period under study only 39 NTMs were withdrawn; four of these were safeguard measures and the remaining thirty-five were anti-dumping measures. Our results remain robust to whether these NTMs are included or excluded from the analysis (results available upon request). None of the NTM types emphasized in this paper were withdrawn during the period of our study.

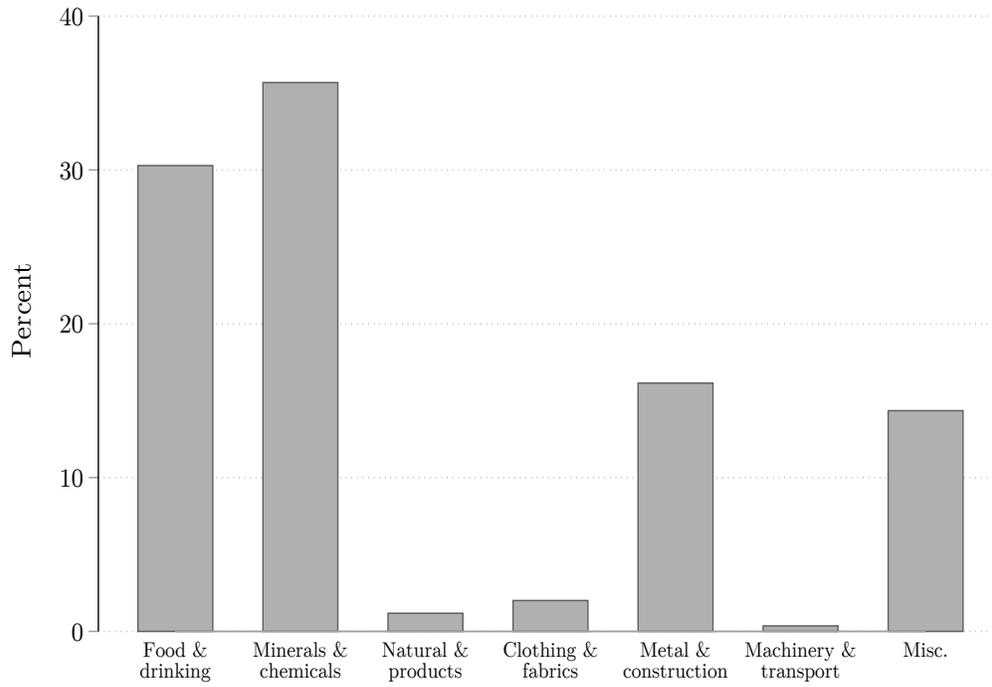
Since all other data are available at the sector level, we aggregate the NTM product-level information at the four-digit sectors defined according to Standard International Trade Classification, and generate a number of indicators to capture different dimensions of non-tariff trade protection. *NTM intro* is a dummy variable that captures the introduction of an NTM in a specific sector-year. The measure is time-varying, either 0 or 1, depending on whether an NTM is introduced in a given sector-year. In addition, we use a number of more refined measures to capture NTM protection, specifically the cumulative number of NTMs (*NTM cum*) and number of new NTMs applied in a given sector-year (*NTM new*). These measures are used in our baseline diff-in-diff regression.

*Controls.* Regarding control variables, we are limited by the type of time-series data available at the four-digit sectoral level.<sup>16</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

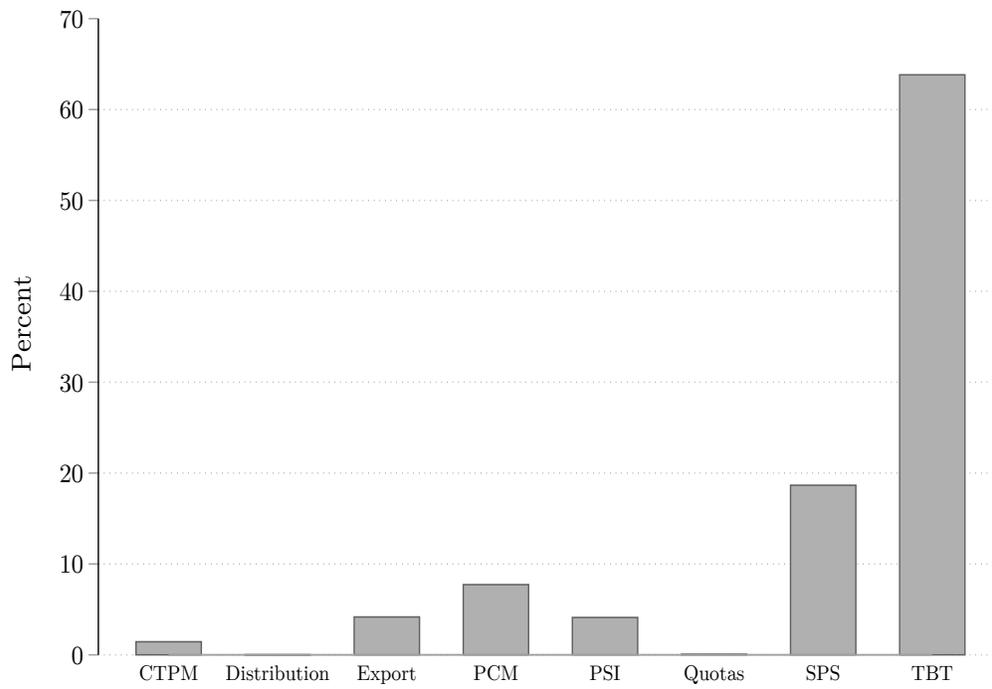
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<sup>16</sup>Alternatively, we could use UNIDO (2013) industrial statistics which provide additional variables, such as the number of employees per sector. However, UNIDO data are only available in irregular intervals, which would result in a highly unbalanced panel. Given this drawback, we give preference to the WITS data.

nation tariff (*MFN*) applied in a sector. All three variables exhibit some skewness and are, therefore, log-transformed. Table 4 provides summary statistics of our data. Figure 2a presents a broad aggregate description of NTMs, and shows a considerable variation in the application of NTMs across sectors. In terms of NTM types, the technical barriers to trade (TBTs) are the most dominant NTM type in Egypt, followed by sanitary and phytosanitary (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. Egypt is among the top five countries globally with the largest number of products affected by NTMs. About 60 percent of products in Egypt are covered by at least one NTM.



(a) NTMs by sector



(b) NTMs by type

Figure 2: Distribution of NTMs by sector and type

[Table 4 here]

## 4 Empirical Analysis

As the preceding discussion shows, the 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. Section 4.1 begins the empirical analysis by presenting some exploratory evidence on the effect of prior crony presence on the incidence of NTM protection. After ascertaining the robustness of these empirical patterns, we provide a more serious attempt at establishing the causal effect of cronyism on NTM protection in section 4.2. To do so, 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 in the last few decades.

### 4.1 EXPLORATORY EVIDENCE

Before trying to establish causal links, we explore whether there is any evidence that crony activity drives the introduction of NTMs across sectors and over time. Our prime focus is on determinants of within-sector variation in the application of NTMs. Specifically, we would like to test whether the prior presence of cronies determines the subsequent introduction of NTMs. For this purpose, we estimate a conditional 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 a dichotomous indicator, which is coded as one when a political crony is present in a given sector and year.

Conditional logit models take into account unit-level effects by conditioning on fixed ef-

fects rather than explicitly including them in the model, thereby avoiding the well-known incidental parameters problem (Beck, 2015).<sup>17</sup> We use a variant of this approach that involves conditioning on the actual number of successes (i.e., NTM introductions) in a group. Another modelling challenge arises from the possibility of temporal dependence (Beck, Katz and Tucker, 1998). To account for temporal dependence, we use time-spell polynomials that capture the length of non-events (i.e., sequence of zeroes preceding an NTM introduction) (Carter and Signorino, 2010).<sup>18</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>19</sup> In the interest of concision, we relegate the details of the model specification to the Online Appendix.<sup>20</sup>

The patterns of results, shown in Table 5, provide strong support to our hypothesis. Lagged crony presence is a strong predictor of NTM introductions as sectors with a prior presence of cronies are systematically more likely to have an NTM introduced in the subsequent year. 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 entry of a crony in such a sector increases this probability to 79 percent on average – an increase by nearly 50 percent. Similarly, we also find crony presence predicts the transition of a sector from the non-NTM to an NTM world as the introduction of the first-ever NTM in a sector becomes much more likely after cronies entered this sector (Table 5, col. 5). Overall, the results provide a strong and

<sup>17</sup>As Beck (2015) shows this has superior finite sample properties compared to the conventional fixed effects logit.

<sup>18</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>19</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).

<sup>20</sup>In the Online Appendix, we additionally run GMM models to explore the effect of crony presence on NTM density. In line with the conditional logit results, we find a strong association between crony entry in a sector and subsequent increases in NTM density. See Online Appendix, Table A3 and A5.

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.

[Table 5 here]

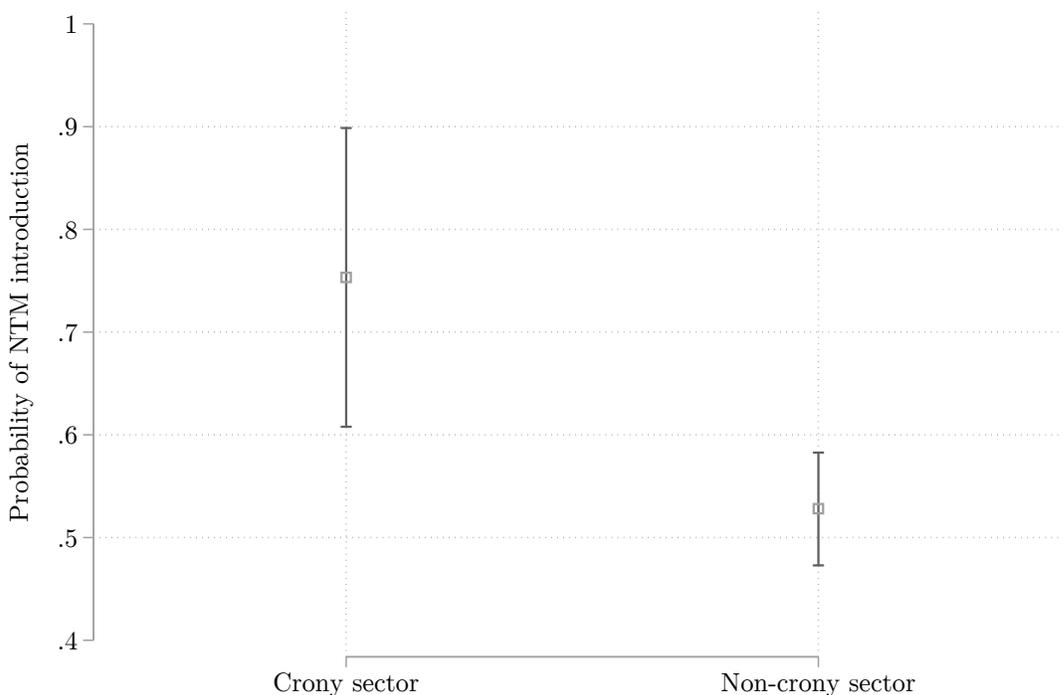


Figure 3: Predicted probability of NTM introduction by crony presence  
*Note:* Probabilities based on estimates in column 4, Table 5.

## 4.2 DIFFERENCE-IN-DIFFERENCES ANALYSIS

### 4.2.1 Identification

To investigate the politics of trade protection, we set up a standard difference-in-difference (DID) regression framework that exploits that timing of the Egypt-EU trade agreement and sectoral differences in prior exposure to cronyism. Estimations are carried out for 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 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 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 decision-making 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:

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

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  $X_{it}$ , and sector and year fixed effects,  $\sum_s I_i^s$  and  $\sum_j I_t^j$ .<sup>21</sup> It is possible that some sectors are more prone to crony presence than others (e.g. car manufacturing, food and beverages, etc.). As long as such preferences are fixed over time, the

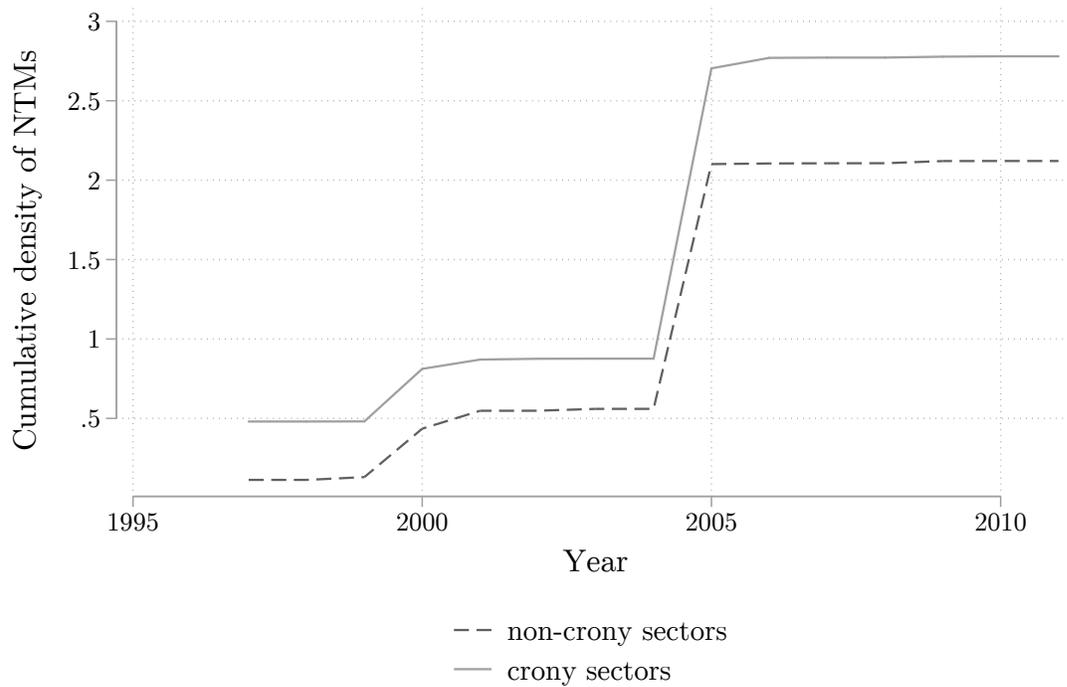
<sup>21</sup>Sector fixed effects control for all time-invariant factors that are specific to each sector, whereas time fixed effects account for secular patterns in the evolution of NTMs.

inclusion of sector fixed effects (at the ISIC-4 level) should account for these. Additionally, we include sector-year interactions at the ISIC-2 level that account for any annual patterns that are specific to sectors ( $\lambda_{it}$ ) that might bias the relationship we are trying to document. For example, if certain ISIC-2 sectors were more subjected to regulatory harmonization over time, then the sector-by-year interactions should account for these. Any selection issue jeopardising our identification strategy would have to arise over and above these sector-specific fixed effects and time trends.

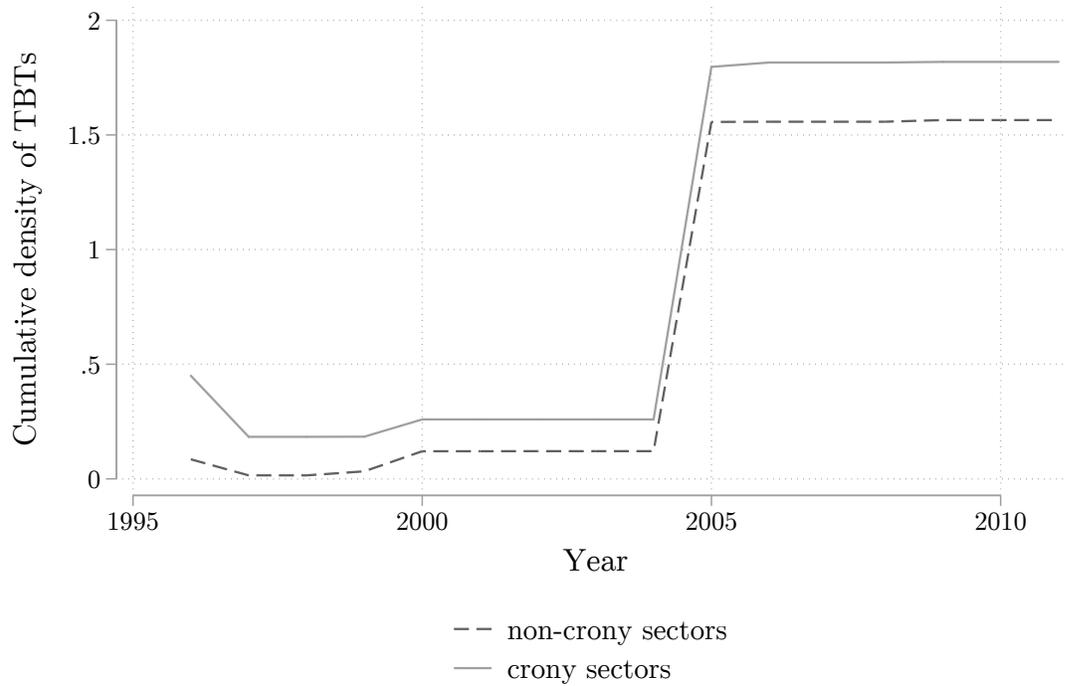
Like any DID exercise, random assignment remains a perennial concern. The validity of our empirical strategy depends on the assumption that the treatment of crony sectors should be exogenous to the future trajectory of NTMs. Another assumption behind our analysis is that events that take place during or after the 2004 EU agreement should equally affect the comparison groups. Defining a reasonable control group is another challenge, which is 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.

#### 4.2.2 *Baseline 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



(a) NTMs combined



(b) TBTs only

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

for a different dependent variable, the 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. The impact is sizeable. Evaluated at the mean, an additional crony in the 1996-98 period leads to a 35 percent increase in NTM density and a 28 percent increase in NTM introductions in the post period. Taken together, these results support our prior in that sectors more densely populated with cronies six years before the trade agreement 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 data for 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.

[Table 6 here]

### 4.2.3 Robustness tests

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

*Predicting crony entry through prior trade protection.* While our focus on early crony presence reduces the possibility that cronies could have anticipated the EU-induced tariff cut, it is still possible that they might have systematically entered into sectors with a greater

potential for NTMs to be applied in future. For example, if cronies preferred to operate in protected sectors with high tariff barriers, then these sectors could receive more compensatory non-tariff protection in future. Looking more closely at the distribution of cronies by 1998 we find that although sectors exposed to cronies were slightly more protected by tariffs compared to non-crony sectors in 1998, the differences were not statistically significant.<sup>22</sup> There was also no noticeable divergence in tariff trends over time for crony and non-crony sectors before or after 2004, as shown in Figure A2 in the Online Appendix. We can also formally investigate the extent to which entry of cronies is predicted by prior levels of trade protection in a given sector. To test this possibility we estimated both a conditional logit model (clogit) and a linear probability model (LPM) to test whether lagged values of average tariffs and cumulative NTMs have any predictive power for crony entry in a sector. Table 7 presents results for the test of the hypotheses that annual lags of tariffs and NTMs *do not predict* crony entry. As the evidence suggests, we are unable to reject the null in each case.

[Table 7 here]

*Extended controls.* A possible concern 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>23</sup> We maintain a consistent sample of 116 sectors for which data is available for all our controls. The results are reported in Table 8. 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.

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<sup>22</sup>The average MFN tariff for crony sectors in 1998 was 49 percent; the corresponding mean for non-crony sectors was 38 percent. A simple t-test of comparison of means yields a p-value of 0.738.

<sup>23</sup>Sector level data on key variables is extremely patchy for most North African states.

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 could be driven by differences in initial levels of trade protection, column 3 includes the log of average tariff rate averaged over the period 1996-98. While its interactions with year fixed effects have considerable explanatory power, our coefficient of interest remains positive and highly significant at the 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 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 A9).

[Table 8 here]

*UNIDO controls.* As a complementary exercise, we also explore the relevance of UNIDO's manufacturing indicators available for ISIC-4 classifications. The INDSTAT4 database (UNIDO, 2013) provides a variety of sector-level indicators that could be included as plausible controls in our regression models. To explore possible size effects, we successively evaluate the effect of the total number of employees, number of establishments, and employees per establishment. Output and value-added per establishment are added as other relevant correlates. Finally, we test whether the sectoral concentration of employment or output drives non-tariff

protection in a sector.<sup>24</sup> Since the UNIDO data has patchy coverage and not available annually, we deploy these variables as additional controls in our two-period DID set-up. The results for both models of *NTM cum* and *NTM new* are reported in the Online Appendix, Tables A11 and A12. Reassuringly, the inclusion of these additional controls does not alter our conclusions.<sup>25</sup> In fact, in most specifications, the coefficient on treatment size interaction with *Post* remains statistically significant at 1% level. Our results also hold when replacing the MFN tariff control with a variable specifically measuring tariffs with the EU (see Table A10, Online Appendix).

*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 next examine whether the underlying patterns in the data support our use of 2004 as the cut-off year. Following Nunn and Qian (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 standard errors are shown in Table 9. 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

<sup>24</sup>Employment concentration is defined as employees in an ISIC-4 sector as a share of total manufacturing sector employment. Similarly, output concentration is defined as output in an ISIC-4 sector as a share of total manufacturing output.

<sup>25</sup>Apart from employment concentration, which has a negative and statistically significant impact on measures of non-tariff protection, none of the UNDO controls turn as important predictors.

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.

[Table 9 here]

*Placebo tests.* We next conduct a placebo exercise to determine whether 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 (0, otherwise). This reduces our sample to 446 observations, with a maximum of four observations per group.<sup>26</sup> All specifications include the available controls, 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 insignificant, since cronyism should not influence sectoral exposure to NTMs before the EU agreement. The results are presented in Table 10. Consistent with our prior the coefficient on crony 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 the number of new NTMs introduced (*NTM new*).<sup>27</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.

[Table 10 here]

*Alternative definition of cronies.* We have thus far used a broader definition of cronies that include *politicians*, *confidants*, and *associates*. This is consistent with the idea that, in an authoritarian context, it is important to account for both direct and indirect political connections. Our identification of political connections is comprehensive, allowing us to furnish a fairly complete mapping of connected businesses at the top end of the pyramid. In

<sup>26</sup>Overall sample size still consists of 119 sectors.

<sup>27</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.

this sense, we err on the side of caution and avoid the inclusion of cases that are not verifiable through publicly available sources of information. Still, to the extent that indirect political connections may be considered as less objective, we check whether our results are robust to using a narrower definition of cronies that only includes *politicians*. All our results are robust to using the narrowly defined crony measure (see Online Appendix, Tables A4-A6).<sup>28</sup>

*Restricted sample with tariff cuts.* Another possible 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 replicate our estimates for the restricted sample of sectors that experienced a tariff cut after the EU agreement. The accompanying results are substantively unchanged and reported in Online Appendix (Table A10).

*Bringing the crony treatment forward.* We also test the robustness of our findings to bringing the classification of treated sectors further back to 1990. Defining treated sectors as those exposed to crony presence by 1990, nearly fourteen years before the EU trade agreement, we re-estimate our core DID specification. This yields a highly robust set of findings (see Table A14 in Online Appendix; Figure A1 for parallel trends ).

*Evidence on NTM sub-types.* NTMs consist of a variety of measures not all of which may have trade-inhibiting effects. To lend further clarity to our analysis, we replicate our baseline DID model for six different NTM sub-types. The test reveals that crony sectors received more NTMs in the form of technical barriers to trade (TBT), pre-shipment inspections (PSI) and, to a lesser extent, price control measures (PCM). Other NTM types do not seem to be affected (see Tables A7-A8 in the Online Appendix).

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<sup>28</sup>In fact, the estimates in Online Appendix show that our results become slightly stronger when we use the narrow definition of cronies.

#### 4.2.4 *DID with IV*

Despite delivering a consistent pattern of results, our initial cronyn treatment might still leave room for skepticism. Although it is highly unlikely that cronies who entered far back in time could have predicted a future shift in trade policy that was mainly the result of 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, 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.

We propose two plausible instruments that could provide an exogenous source of variation for our measure of treatment intensity. Our first instrument uses information on the presence of cronies in neighbouring sectors. We believe that, in North Africa, the entry decision of cronies can be modelled through clan networks. Cronies tend to build broad clusters and might favour operating in sectors that are already populated by other cronies or relatives. This is a relatively common pattern. For example, the El-Sewedy family is active in the production of ceramics (ISIC 2691), clay (ISIC 2693), clinkers, and tiles (ISIC 2694) – all of which are closely related sectors. The Mahmoud family produces both pulp (ISIC 1701) and cardboard (ISIC 1702). Prior presence of cronies can be beneficial 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 provide insurance against policy uncertainty.

To operationalize this, we construct a measure of neighbouring cronies per sector (*neighbour-crony ratio*). Neighbour is defined in a narrow technical sense, whereby all sub-groups within

a 3-digit sector are treated as neighbours. We use the same time window as for the initial crony treatment, i.e., 1996-98. For example, for the ISIC 3 sector of basic chemicals (241), there are three neighbouring 4-digit sectors, that is, manufacture of basic chemicals (2411), fertilizers (2412), and plastics (2413). To construct our instrument for any given sector, we divide the total number of cronies active in the neighbourhood (excluding a crony's own sector) by the total number of neighbouring sectors.

To give a numerical example for fertilizers (2412), the total number of cronies in neighbouring sectors is one and there are two neighbouring sectors, yielding a ratio of 0.5.<sup>29</sup> If, for whatever reason, cronies tend to prefer operating in sectors already inhabited by other cronies, we should expect to obtain a negative association between our instrument and crony treatment ( $Cronyn_i$ ). In other words, they would rather be in one of the neighbouring sectors than in the 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, the validity of our instrument 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 (Table A15). The exclusion restriction can be checked more generally by including our instrument as an additional control in the main specification. This results in a statistically insignificant coefficient, which suggests that our instrument does not drive 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 and Tunisia, a North African neighbour. After the Arab Spring, both Egypt and Tunisia were held out as comparable cases of crony

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<sup>29</sup>This means that sectors with no neighbouring sectors get dropped from the sample, thereby reducing the sample size.

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), opportunities to derive quick profits (low skill/technology and high profit margins), FDI restrictions, and exposure to privatization (World Bank, 2015; Rijkers, Freund and Nucifora, 2017). In short, 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. Importantly, despite the strong correlation between crony presence in the two countries, it is implausible that the political cronies in Tunisia could have driven trade protection in Egypt.

A key challenge for this exercise is the parallel compilation of database on Tunisian cronies active under Ben Ali's regime. To conserve space, we provide the details for this intensive data exercise separately in the Online Appendix. Comparing crony presence by sectors across the two countries, the summary evidence shows that there is considerable overlap in the sectoral exposure to cronies in Tunisia and Egypt. As expected, many of the key manufacturing sectors, such as food, textile, wood, paper, motor vehicles, and furniture are served by cronies in both countries (see Online Appendix, Table A16). Food sectors, for instance, are likely to have benefited from the extensive system of food subsidies in both countries, which means that market entry requires special licences. Other sectors, such as papers and textile, are particularly energy-intensive (UNIDO, 2010) and thus proportionally receive a higher share of energy subsidies. We will utilize information on whether or not a sector is exposed to cronyism in Tunisia as 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  $Cronyn_i$ . As before, instrument validity requires that  $CronyTunisia$  be correlated with the treatment variable but has no direct explanatory power for 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:

$$Cronyn_i.I_t^{Post} = \gamma_i + \gamma_2 neighbour_i.I_t^{Post} + \Phi_j \lambda_{it} + \sum_s \theta_s I_i^s + \sum_{j=2002}^{2011} \rho_j I_t^j + \mu_{it},$$

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. To ensure that our results are not driven by other unobservable sectoral characteristics, we control both for sector-specific fixed effects and sector time trends. 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 11. 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, *Crony-Tunisia*. As before, the instrument is a strong predictor of the exposure of Egyptian sectors to cronyism in late 1990s. The interactive term,  $CronyTunisia \cdot I_t^{Post}$ , 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. 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.

[Table 11 here]

#### 4.2.5 *Significance for trade policy and development*

In this section we comment on the broader significance of NTMs for rent seeking, trade policy and development in Egypt. The costs of NTMs can be summarized through their ad-valorem equivalents (AVE), which describe the impact of NTMs in terms of their tariff equivalents. Unfortunately, updated estimates of NTM-AVEs in Egypt are unavailable. We will, however, offer some illustrative leads below to highlight the salience of our findings.

Generally speaking, NTMs have been shown to be at least as distortive as tariffs. According to a study by Kee, Nicita and Olarreaga (2009, 183), in 55 percent of tariff lines subjected to NTMs the AVE of core NTMs is higher than the corresponding tariff. A recent World Bank report reached a similar conclusion: “in almost all sectors NTMs are more important

than tariffs” (World Bank, 2018). There is growing evidence that NTMs are more costly than tariffs. Egypt fared poorly on the AVE estimates constructed by Kee et al. (2009). It had the seventh highest average AVE of core NTMs (0.395). Trade restrictiveness indices, which capture the distortionary effect of trade protection on a country’s own welfare, provide further corroborative evidence. Egypt falls in the category of countries where the contribution of NTMs to the overall restrictiveness of trade policies is greater than the contribution of tariffs. Its trade restrictiveness index more than doubles from 0.224 to 0.586 once NTMs are taken into account, making it one of the most protective trade regimes in the world.

The strong connection between cronyism and non-tariff measures in Egypt established in this paper underscores the political foundations of such trade protection. One way of evaluating the significance of our findings is to compare the AVE estimates for NTMs across politically connected sectors and unconnected sectors before and after the EU agreement. While this would require updated AVE estimates for the period after the EU agreement, which are unavailable, we can still use the estimates for the pre-2004 period to carry out this exercise. This would be a conservative strategy as it is reasonable to assume that, if anything, AVE estimates for the post-EU periods are likely to be even higher. In this sense, our empirical comparison would underestimate the true scale of trade protection.

A selective look at the data reveals some interesting patterns. For example, in the cables sector (2922), which was dominated by the El Seweidy family, about 62 percent of the product lines had, in 2010, an AVE of NTMs that exceeded the pre-liberalization tariffs in 1997. Remarkably, the average difference between the AVE in 2010 and the 1997 tariffs was a whopping 80 percent. Similarly, in the publishing sector (2212) where the Diab family had an active market presence and the mining sector (1600) where Gamal Moharram enjoyed controlling stakes, 100 percent of product lines had an AVE for NTMs that was higher than the pre-liberalization tariffs. Importantly, the AVEs were 50 percent higher than the tariffs in 1997. These examples illustrate how some connected insiders actually ended up securing

greater protection in the wake of trade liberalization, possibly nullifying the effects of trade reform. The wave of non-tariff protection therefore seems to have generated additional rents for such cronies.

*NTM types and costs of compliance.* While Egypt is not included in the list of top 25 emerging markets for which the World Bank and UNCTAD recently compiled the AVE estimates, the overall findings are hugely pertinent for Egypt (World Bank, 2018). Firstly, partly due to the inefficient implementation of regulations and the higher costs of compliance, NTMs are more costly for developing countries. Secondly, AVE estimates differ markedly across product lines and sectors. In terms of sectoral spread, the AVEs are particularly high for apparel, motor vehicles, electrical machinery, wood and paper sectors. Interestingly, all of these sectors have large exposure to political cronies in Egypt. Thirdly, the trade impact of NTMs is mainly attributable to technical measures where the costs of conformity verification are typically higher in developing countries. The average AVEs of technical measures is 11 percent compared to 9 percent for non-technical measures (World Bank, 2018).

An important implication is that the impact of NTMs is partly determined by the type of NTMs used and the associated costs of compliance. This paper offers a concrete lead in this regard. As shown earlier, the empirical relationship between cronyism and non-tariff protection in Egypt is principally driven by two technical measures: the TBTs and PSIs. Digging in further, we find that the three most prevalent TBT categories in Egypt were all related to inspection requirements and conformity assessments (B84, B859 and B89, see Figure 5) that require administrative oversight and are susceptible to discriminatory bureaucratic action. These are precisely the sort of regulations that can be more cumbersome for unconnected firms and drive a wedge between *de jure* intent of trade regulations and *de facto* practice. The growing scope of technical measures that Egypt witnessed in the wake of the EU agreement clearly seems to have benefited politically connected sectors. This is consistent with the suggestion in Zingales (2017) that “the size and complexity of regulation

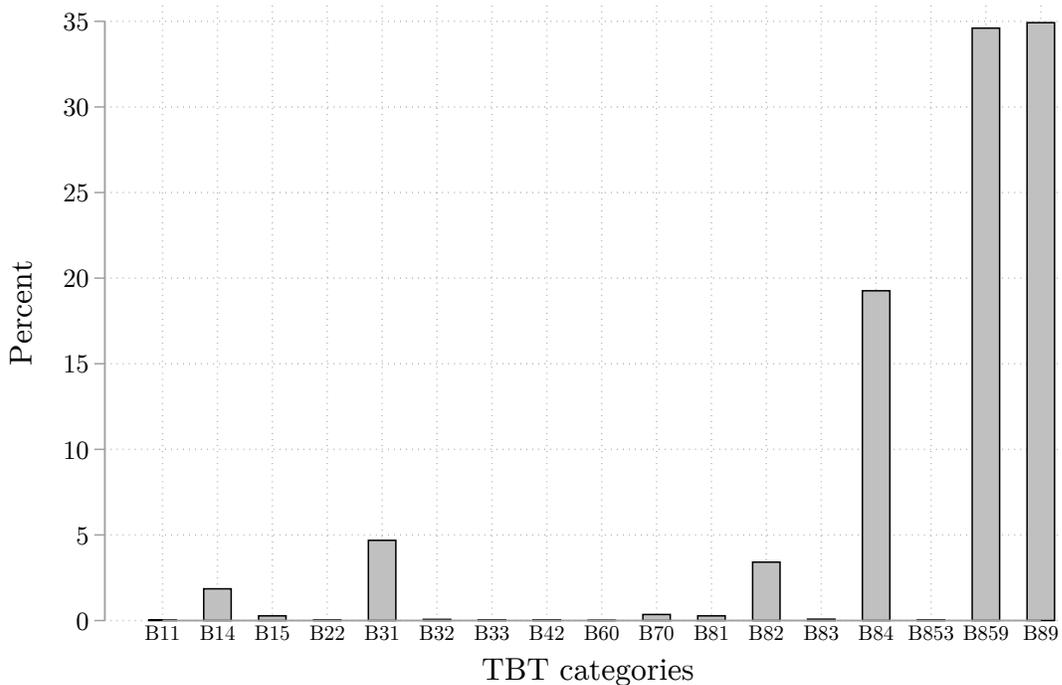


Figure 5: TBT sub-categories prevalent in Egypt

has increased, which makes it easier for vested interests to tilt the playing field”.

Beyond Egypt, our empirical analysis has wider implications for advancing prosperity in Arab economies. The Middle East has the most pervasive non-tariff barriers in the world, leaving behind even sub-Saharan Africa. Such non-tariff protection creates important trade frictions with adverse consequences for firms. Recent survey evidence from Arab economies shows that NTMs are regarded as burdensome by 44 percent of all companies engaged in imports and exports. Survey findings also suggested that NTMs act as a significant barrier to the expansion of regional trade among Arab economies, a key factor inhibiting economic development in the region (International Trade Centre, 2015). This paper shows that removal of these trade frictions requires not just technocratic reform but a due consideration of the political constituencies supported by such NTMs.

## 5 Conclusion

This article has examined the extent to which politically connected actors in late-Mubarak Egypt were able to receive preferential trade protection in the wake of a major episode of trade policy substitution triggered by an EU trade agreement. Focusing on non-tariff measures, our empirical analysis combines 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 specific sectors. We then corroborate the link between cronyism and NTM protection by conducting a difference-in-difference analysis that exploits the introduction of the EU-Egypt trade agreement in 2004 as an exogenous shock to the Egyptian trade policy regime. Our analysis demonstrates that sectors where cronies who had entered a manufacturing sector by 1998 – six years prior to the trade agreement – received about 30 percent higher compensation in the form of NTMs for the ensuing tariff cut than non-crony sectors.

We show that our findings on NTMs are principally driven by technical barriers to trade and pre-shipment inspections, measures that are particularly susceptible to bureaucratic abuse and selective enforcement, thereby privileging politically connected businesses. 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 cluster in sectors with prior presence of politically connected actors 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 can enrich contemporary debates about globalization and crony capitalism. As growing disaffection with trade liberalization endangers the very legitimacy of economic reform, this paper casts fresh light on the domestic political foundations of trade policy.

While prior literature on the subject has focused predominantly on Western economies and tariffs, our analysis is one of the first ones to address the determinants of NTMs in a developing context. We highlight the potential for political capture of trade policy by crony entrepreneurs in a weak institutional milieu, characterised by limited rule of law and the absence of democratic accountability. Our study, in turn, breaks new ground by demonstrating the endogeneity of trade policies to crony influence. Finally, this study represents a practical illustration of elite co-optation in an authoritarian political system and furnishes micro-level evidence on how economic policies can be used to tie business elites to the regime.

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Table 1: Economic activities of prominent Egyptian crony capitalists

<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	
Mohammed Abu El-Enein	Cleopatra Group	Food products and beverages
		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
		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
		Industrial and construction equipment
		Leather products
Mansour family	Mansour Group	Automobile sector
		Cigarettes, cosmetics
		Food products and beverages
		Household equipment
		Entertainment and IT
		Industrial and construction equipment
		Retail
		Tourism
	Mansour & Maghraby Investment and Development	Finance, investment, real estate
Mohammed Nosseir	Alkan Holdings	Automobile sector
		Textiles

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

El-Sewedy family	Elsewedy Engineering 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 Iskraemeco Measurement and Energy Systems	Industrial and construction equipment
Talaat Mustapha family	Talaat Mustapha Group	Finance, investment, real estate
Safwan Thabet	Juhayna Group	Food products and beverages

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Source: Adapted from Roll (2010).

Table 2: Political connections of prominent Egyptian crony capitalist

<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) 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) NDP: Member of Business Secretariat
Mohammed Khamis	MP
Mansour family	Minister of Transport (2004-11)
Rachid family	Minister of Industry (2004-11) NDP: Member of General and Political Secretariat
Hussein Salem	Family contacts to Mubarak family
Sallam Family	NDP: Member Member of National Youth Council
Sawiris family	NDP: Member of Business Secretariat 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

Source: Alissa (2007); Demmelhuber and Roll (2007); Roll (2010, 2013).

Table 3: Percentage of sub-sectors (ISIC4) with crony activity

Manufacturing Sector (ISIC 2)	Proportion of sub-sectors with crony presence
Food products and beverages	59
Tobacco products	80
Textiles	70
Wearing apparel	50
Tanning and dressing of leather	67
Wood products	40
Paper and paper products	32
Publishing and printing	56
Coke and refined petroleum products	30
Chemicals	62
Rubber and plastics	68
Other non-metallic mineral products	95
Basic metals	75
Fabricated metal products	65
Machinery and equipment	33
Office, accounting and computing machinery	0
Electrical machinery	68
Radio, television and communication equipment	78
Medical, precision and optical instruments	54
Motor vehicles	95
Other transport equipment	14
Furniture	68

Source: Own data.

Table 4: Summary statistics

	Mean	SD	Mean	SD	Mean	SD	Min	Max	N
	<i>Full Sample</i>		<i>Pre-period</i>		<i>Post-period</i>		<i>Full Sample</i>		
NTM intro	0.070	0.255	0.045	0.208	0.093	0.291	0	1	2542
NTM new	0.305	1.322	0.178	0.973	0.424	1.574	0	15	2535
NTM cum	1.381	2.074	0.435	1.209	2.273	2.311	0	10.591	2535
NTM share	0.336	0.423	0.118	0.262	0.542	0.443	0	1	2542
NTM2 share	0.330	0.422	0.105	0.247	0.542	0.443	0	1	2535
NTM chapter	0.552	0.814	0.198	0.526	0.885	0.893	0	3.188	2535
Crony presence	0.653	0.476	0.610	0.488	0.689	0.463	0	1	4480
Crony count	1.849	2.718	1.538	2.272	2.103	3.011	0	23	4,480
Initial crony count	.	.	1.478	2.222	.	.	0	16	4,480
Neighbour-crony ratio	.	.	1.390	1.890	.	.	0	12	2,820
Imports, ln	7.104	1.818	6.740	1.754	7.594	1.788	0.000	12.673	1649
Exports, ln	5.095	2.065	4.613	1.796	5.756	2.223	2.398	12.391	1556
Tariffs, ln	2.460	1.131	2.866	0.976	2.100	1.136	0.000	8.216	2462

*Notes:* Observations are at the sector-year level. The full sample is defined over the period, 2001-2011. The pre-period refers to the sub-period, 2001-2004, whereas the post-period covers the period, 2005-2011. Key variables are denoted in brackets as follows: NTM intro (a dummy variable capturing the introduction of an NTM); NTM new (number of new NTM introductions); NTM cum (cumulative number of NTMs applied); NTM share (share of products subjected to NTMs); NTM2 share (share of products subjected to at least two NTMs); NTM chapter (average number of different NTM chapters applied); Crony presence (dummy variable capturing the presence of a political crony); and Neighbour-crony ratio (total number of cronies in neighbouring sectors divided by the number of neighbouring sectors, measured in the initial time window 1996-98).

Table 5: 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*** (0.395)	1.202*** (0.421)	1.165*** (0.430)	1.310*** (0.445)	16.86*** (1.460)
Imports $t_{-1}$		-0.262 (0.195)	-0.267 (0.184)	-0.291 (0.198)	-0.480 (0.566)
Exports $t_{-1}$			-0.0304 (0.158)	-0.0238 (0.159)	0.342 (0.399)
Tariffs $t_{-1}$				-0.481 (0.313)	-5.843*** (1.307)
Time spell	0.684** (0.286)	0.593** (0.262)	0.699** (0.288)	0.761** (0.304)	
Time spell <sup>2</sup>	-0.262** (0.116)	-0.257** (0.110)	-0.280** (0.114)	-0.289** (0.120)	
Time spell <sup>3</sup>	0.0312*** (0.00949)	0.0311*** (0.00920)	0.0318*** (0.00948)	0.0316*** (0.00989)	
Prefail	-0.0631*** (0.0183)	-0.0804*** (0.0281)	-0.0723* (0.0394)	-0.117** (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

*Notes:* Conditional logistic fixed effects regression. Cluster-robust standard errors in parentheses. Crony variable based on broad definition of cronies. Prefail denotes the number of previous introductions of NTMs.  
\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

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** (0.0663)	0.143** (0.0652)	0.148** (0.0632)	0.174** (0.0678)	0.132** (0.0613)	0.0725** (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

*Notes:* 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: Trade protection and crony entry

	Tariffs	NTMs (cumulative)	Test of joint significance
clogit	0.146	0.547	0.277
LPM	0.179	0.619	0.325
Previous crony entries	Yes	Yes	Yes
Duration dependence	Yes	Yes	Yes

*Notes:* The table reports the p-values from the tests of non-predictability of crony entry. The row denoted as 'clogit' provides p-values of the *chi-square* test of the hypothesis that lagged average MFN tariffs and NTMs have no predictive power for crony entry, individually or jointly. The second row (LPM) reports p-values of the *F*-test based on a linear probability model. All models include as additional controls: the lagged levels of exports and imports (logged and weighted by the number of products per sector), number of previous entries of cronies and indicators of duration dependence.

Table 8: Robustness tests for DID – NTM cumulative

	(1)	(2)	(3)	(4)	(5)
Initial crony count x Post	0.133** (0.0645)	0.147** (0.0664)	0.190*** (0.0634)	0.108* (0.0638)	0.111* (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

*Notes:* 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 9: Flexible specification estimates

	(1)	(2)
	NTM cum	NTM new
Initial crony count x 2002	-0.00776 (0.0126)	-0.0133 (0.0169)
Initial crony count x 2003	-0.0227 (0.0269)	-0.0304 (0.0312)
Initial crony count x 2004	-0.0317 (0.0393)	-0.0640 (0.0528)
Initial crony count x 2005	0.145* (0.0733)	0.124* (0.0708)
Initial crony count x 2006	0.149** (0.0684)	0.133** (0.0660)
Initial crony count x 2007	0.141** (0.0621)	0.121** (0.0594)
Initial crony count x 2008	0.132** (0.0582)	0.107* (0.0579)
Initial crony count x 2009	0.133** (0.0570)	0.104* (0.0608)
Initial crony count x 2010	0.126** (0.0581)	0.0830 (0.0642)
Sector x Time	Yes	Yes
Adj R-sq	0.743	0.765
Sectors	119	119
NxT	1309	1102

*Notes:* 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 2001-2010. Crony variable is based on broad definition of cronies. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table 10: Placebo tests

	(1)	(2)	(3)	(4)
	NTM cum	NTM cum	NTM new	NTM new
Initial crony count x Post	-0.00696 (0.00811)		-0.0105 (0.0555)	
Initial crony dummy x Post		-0.0230 (0.0235)		-0.0129 (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

*Notes:* 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 11: Difference-in-difference regressions with IV

	(1)	(2)	(3)	(4)	(5)
	Dep. Variable: Cumulative number of NTMs				
Initial crony count x Post	0.125** (0.052)	0.200** (0.102)	0.261** (0.126)	0.247*** (0.0954)	0.192** (0.0870)
<i>First stage</i>					
Neighbour-crony ratio		-.709*** (0.079)		-.734*** (0.080)	-.859*** (0.082)
Crony presence in Tunisia			.632*** (0.114)	.316*** (0.118)	.348*** (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

*Notes:* 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. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

# Online Appendix

## DISTRIBUTION OF NTMS BY TYPE AND SECTOR

Table A1: Share of products affected by at least one NTM by sector and NTM type in 2010

Manufacturing sector (ISIC 2)	SPS	TBT	PSI	CTPM	QT	PCM	DR	EM
Food products and beverages	0.730	0.956	0.044	0	0.002	0.372	0	0.078
Tobacco products	0.167	1.000	0	0	0	0	0	0
Textiles	0.063	0.914	0.339	0	0	0.345	0	0.058
Wearing apparel	0	0.957	0.064	0	0	0	0	0
Tanning and dressing of leather	0	0.803	0.059	0	0	0.255	0	0
Wood products	0.563	0.635	0	0	0	0.563	0	0
Paper and paper products	0	0.828	0	0	0	0.573	0	0
Publishing and printing	0	0.667	0	0	0	0.143	0	0
Coke and refined petroleum	0	0.914	0	0	0	0	0	0
Chemicals	0.094	0.771	0	0	0	0.013	0.010	0
Rubber and plastics	0	0.885	0.038	0.019	0	0.536	0	0
Other non-metallic mineral	0.002	0.621	0	0	0	0.073	0	0
Basic metals	0	0.067	0	0.021	0	0.023	0	0
Fabricated metal products	0	0.003	0	0	0	0	0	0
Machinery and equipment	0	0.013	0	0	0	0	0	0
Officea and computing	0	0.100	0	0	0	0	0	0
Electrical machinery	0	0.005	0	0.071	0	0	0	0
Radio and communication	0	0	0	0	0	0	0	0
Medical and optical instruments	0	0.047	0	0	0	0	0	0
Motor vehicles	0	0	0	0	0	0	0	0
Other transport equipment	0	0	0	0	0	0	0	0
Furniture	0	0.056	0.008	0.004	0	0	0	0

*Notes:* SPS = sanitary and pro-sanitary measures; TBT = technical barriers to trade; PSI = pre-shipment clearance; CTPM = charges, taxes, and other para-tariff measures; QT = Quotas; PCM = price control measures; DR = distribution restrictions; EM = export measures.

## CONDITIONAL LOGIT MODEL

Having only briefly outlined the conditional logit model in the main body of the manuscript, we detail the model specification in this section. This reiterates some of the main characteristics of the model described in the paper.

Combining the conditional logit model with approaches developed for events history analysis 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.

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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 explicitly 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>1</sup>

Another modelling challenge arises from the possibility of temporal dependence (Beck, Katz and Tucker, 1998). 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 (i.e., sequence of zeroes preceding an NTM introduction) (Carter and Signorino, 2010).<sup>2</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>3</sup> Table A2 replicates the results as shown in section 4.1 of the paper.

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<sup>1</sup>As Beck (2015) shows this has superior finite sample properties compared to the conventional fixed effects logit.

<sup>2</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>3</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).

Table A2: 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*** (0.395)	1.202*** (0.421)	1.165*** (0.430)	1.310*** (0.445)	16.86*** (1.460)
Imports $t_{-1}$		-0.262 (0.195)	-0.267 (0.184)	-0.291 (0.198)	-0.480 (0.566)
Exports $t_{-1}$			-0.0304 (0.158)	-0.0238 (0.159)	0.342 (0.399)
Tariffs $t_{-1}$				-0.481 (0.313)	-5.843*** (1.307)
Time spell	0.684** (0.286)	0.593** (0.262)	0.699** (0.288)	0.761** (0.304)	
Time spell <sup>2</sup>	-0.262** (0.116)	-0.257** (0.110)	-0.280** (0.114)	-0.289** (0.120)	
Time spell <sup>3</sup>	0.0312*** (0.00949)	0.0311*** (0.00920)	0.0318*** (0.00948)	0.0316*** (0.00989)	
Prefail	-0.0631*** (0.0183)	-0.0804*** (0.0281)	-0.0723* (0.0394)	-0.117** (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

*Notes:* Conditional logistic fixed effects regression. Cluster-robust standard errors in parentheses. Crony variable based on broad definition of cronies. Prefail denotes the number of previous introductions of NTMs.

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

## GMM MODEL

Our logit analysis afforded useful insights on transition dynamics by asking whether prior presence of cronies might predict the subsequent introduction of an NTM. 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 , 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 de-

tails).<sup>4</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 (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>5</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, 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 A3. 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: the share of products in a sector that are covered by at least two NTMs (*NTM2 share*).

<sup>4</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>5</sup>Specifically, the following assumptions are required to hold:  $E[\Delta y_{s2}u_s] = E[\Delta CronyPr_{s,t}u_s] = E[x_{s,t}^k u_s] = 0$ .

The corresponding result in column 2) shows that the coefficient on lagged crony presence is again 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 such 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 to systematically enter 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.

Table A3: NTM density and crony activity

	(1)	(2)	(3)
	NTM share	NTM2 share	NTM chapter
Crony presence $t_{-1}$	0.0661*** (0.0256)	0.0675** (0.0264)	0.0462* (0.0281)
Imports $t_{-1}$	-0.0171*** (0.00594)	-0.0174*** (0.00602)	-0.0177* (0.00973)
Exports $t_{-1}$	0.00832** (0.00368)	0.00823** (0.00367)	0.000656 (0.00666)
MFN $t_{-1}$	0.00519 (0.00671)	0.00485 (0.00671)	-0.00981 (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

*Notes:* 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. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

## ROBUSTNESS TESTS 1: NARROW DEFINITION OF CRONIES

In the following series of robustness tests, we reurn our baseline conditional logit (Table 3), GMM (Table 4) and DID model (Table 5) using a narrow definition of cronies. To recall, our narrow definition of cronies only includes *politicians*, that is, cronies with political 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). This excludes the other other types of cronies, *associates* and *confidants*. The results shown in Tables A4-A6 confirm the robustness of our findings to different ways of measuring crony activity across sectors. Only in column 3, Table A5 our crony variable fails to reach significance ( $p=0.27$ ), which is probably due to some remaining serial correlation as indicated by the low p-value ( $p=0.07$ ) of the AR(2) test.

Table A4: NTM introduction and crony activity – narrow definition of cronies

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

*Notes:* Conditional logistic fixed effects regression. Cluster-robust standard errors in parentheses Crony variable based on narrow definition of cronies. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table A5: NTM density and crony activity – narrow definition of cronies

	(1)	(2)	(3)
	NTM share	NTM2 share	NTM chapter
Crony presence $t_{-1}$	0.0626*** (0.0229)	0.0635*** (0.0242)	0.0311 (0.0283)
Imports $t_{-1}$	-0.0149** (0.00588)	-0.0153*** (0.00591)	-0.0180* (0.00987)
Exports $t_{-1}$	0.00658* (0.00357)	0.00679* (0.00360)	0.00192 (0.00628)
MFN $t_{-1}$	0.00624 (0.00676)	0.00617 (0.00681)	-0.00991 (0.00960)
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)	0.659	0.986	0.07

*Notes:* System GMM estimates with sectors and year fixed effects and cluster-robust standard errors. Crony variable based on narrow 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 A6: Results for difference-in-difference model – narrow definition of cronies

	(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** (0.0663)	0.143** (0.0652)	0.148** (0.0632)	0.174** (0.0678)	0.118* (0.0626)	0.074** (0.0292)
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	0.751	0.774	0.437	0.441	0.876	0.616
Sectors	119	119	119	119	119	119
NxT	1309	1102	1309	1102	238	238

*Notes:* 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 narrow definition of cronies. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

## ROBUSTNESS TESTS 2: DID MODEL

To probe the robustness of our DID model, we present six types of tests: (i) an estimation of NTM subtypes; (ii) the use of a treatment dummy instead of continuous measure of treatment; (iii) the inclusion of additional control variables from the UNIDO Indstat dataset; (iv) the restriction of our sample to only those sectors that experienced a tariff cut in 2004; (v) a redefinition of treated sectors bringing the cut-off year between treated and untreated sectors forward to 1990; (vi) the inclusion of our instrumental variables as normal controls in the baseline regression to statistically demonstrate the validity of the exclusion restriction. In addition, we provide further details on our Tunisia crony data, including a number of descriptive statistics.

### *NTM subtypes*

In Tables A7 and A8, we replicate our baseline DID model for NTM subtypes. The test reveals that crony sectors received more NTMs in the form of technical barriers to trade (TBT), pre-shipment inspections (PSI), and to a lesser extent price control measures (PCM). Other types of NTMs do not seem to be affected.

Table A7: Results for difference-in-difference model by NTM subtype (cumulative)

	(1)	(2)	(3)	(4)	(5)	(6)
	SPS	TBT	PSI	CTPM	PCM	EM
Initial crony count x Post	0.0187 (0.0180)	0.0956** (0.0469)	0.0254** (0.0123)	-0.00266 (0.00345)	0.00510 (0.0113)	0.000370 (0.000361)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Sector trends	Yes	Yes	Yes	Yes	Yes	Yes
Adj R-sq	0.388	0.795	0.373	0.101	0.529	0.0276
Sectors	119	119	119	119	119	119
NxT	1102	1102	1102	1102	1102	1102

*Notes:* Observations are at the sector-year level. The dependent variable is the cumulative number of NTM subtypes applied in a given sector-year (NTM new). NTM subtypes Quotas and DR could not be estimated. 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 A8: Results for difference-in-difference model by NTM subtype (new)

	(1)	(2)	(3)	(4)	(5)	(6)
	SPS	TBT	PSI	CTPM	PCM	EM
Initial crony count x Post	0.00853 (0.0178)	0.143*** (0.0515)	0.0339** (0.0141)	-0.00774 (0.00841)	0.0250* (0.0127)	0.00395 (0.00764)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Sector trends	Yes	Yes	Yes	Yes	Yes	Yes
Adj R-sq	0.126	0.507	0.0833	0.0352	0.132	0.0307
Sectors	119	119	119	119	119	119
NxT	1102	1102	1102	1102	1102	1102

*Notes:* Observations are at the sector-year level. The dependent variable is the number of new NTM subtypes applied in a given sector-year (NTM new). NTM subtypes Quotas and DR could not be estimated. 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. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

### *Treatment dummy*

In Table A9, we replicate our baseline DID model using a dummy indicator instead of a continuous measure of treatment. To recall, we consider sectors as treated by they were populated by cronies by 1998, that is, six year before the EU-Egypt trade agreement. On the whole, the results support our main finding that crony sectors benefited significantly more from NTM protection in the wake of the EU-Egypt trade agreement than non-crony sectors.

The results are particularly strong when using the number of NTMs introduced as the dependent variable, both in the annual panel and the two-period model. When using the cumulative number of NTMs, we recover our main result in the annual panel, albeit slightly weaker than our results with a continuous treatment measures. Only in the two-period model in column 5, the interaction term ceases to be significant ( $p=0.27$ ) while showing the expected direction of sign. We would like to point out, however, that the cumulative measure of NTMs contains, by construction, less over-time variation, which is further compressed when collapsing the measure in a two-period model. In addition, our treatment dummy further compresses variation in the data, which, in combination, entails the loss of precision as shown by the increasing standard error of the interaction term. Given that all other permutations of the model in Table A9 show a significant finding, we are not too concerned by non-finding in column 5.

Table A9: Results for difference-in-difference Model – treatment dummy

	(1)	(2)	(3)	(4)	(5)	(6)
	NTM cum	NTM cum	NTM new	NTM new	NTM cum	NTM new
Initial crony dummy x Post	0.230* (0.161)	0.262* (0.155)	0.328** (0.138)	0.355** (0.151)	0.176 (0.156)	0.153** (0.075)
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	0.749	0.771	0.436	0.439	0.868	0.611
Sectors	119	119	119	119	119	119
NxT	1309	1102	1309	1102	238	238

*Notes:* 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. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

*Controlling for EU tariffs*

In Table A10 below, we control for the Egyptian tariffs rates towards the EU as NTMs might have been introduced as a particularly compensation measure to mitigate the effect of lower tariffs towards the trade bloc. Our main findings remain unchanged.

Table A10: Difference-in-difference model with EU tariff control

	(1)	(2)	(3)	(4)
	NTM cum	NTM new	NTM cum	NTM new
Initial crony count x Post	0.138** (0.066)	0.170** (0.067)	0.116* (0.066)	0.072** (0.029)
EU tariff rate	0.143 (0.115)	0.127 (0.094)	0.278 (0.269)	0.022 (0.080)
Two-period	No	No	Yes	Yes
Controls	Yes	Yes	Yes	Yes
Sector trends	Yes	Yes	Yes	Yes
Adj R-sq	0.775	0.440	0.869	0.616
Sectors	119	119	119	119
NxT	1102	1102	238	238

*Notes:* 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 weighted by number of products. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

### *UNIDO controls*

As a complementary exercise, we also explore the relevance of UNIDO’s manufacturing indicators available for ISIC-4 classifications. The INDSTAT4 database (UNIDO, 2013) provides a variety of sector-level indicators that could be included as plausible controls in our regression models. To explore possible size effects, we successively evaluate the effect of the total number of employees, number of establishments, and employees per establishment. Output and value-added per establishment are added as other relevant correlates. Finally, we test whether the sectoral concentration of employment or output drives non-tariff protection in a sector.<sup>6</sup> Since the UNIDO data has patchy coverage and not available annually, we deploy these variables as additional controls in our two-period DID set-up. The results for both models of *NTM cum* and *NTM new* are reported in Tables A11 and A12 below. Reassuringly, the inclusion of these additional controls does not alter our conclusions.<sup>7</sup> In fact, in most specifications, the coefficient on treatment size interaction with *Post* remains statistically significant at 1% level.

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<sup>6</sup>Employment concentration is defined as employees in an ISIC-4 sector as a share of total manufacturing sector employment. Similarly, output concentration is defined as output in an ISIC-4 sector as a share of total manufacturing output.

<sup>7</sup>Apart from employment concentration, which has a negative and statistically significant impact on measures of non-tariff protection, none of the UNDO controls turn as important predictors.

Table A11: Difference-in-difference model with UNIDO controls – NTM cum

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Initial crony count x Post	0.152** (0.0584)	0.160*** (0.0599)	0.181*** (0.0598)	0.172*** (0.0592)	0.169*** (0.0579)	0.159*** (0.0576)	0.150** (0.0598)	0.170*** (0.0592)
Employees	0.0570 (0.0783)							0.0922 (0.116)
Establishments		0.238 (0.154)						0.0890 (0.195)
Output per firm			-0.0642 (0.0564)					
Employees per firm				-0.192 (0.143)				
Value-added per firm					-0.0760 (0.0822)			
Employees concentration						-66.34*** (18.65)		-71.14*** (17.46)
Output concentration							-4.239 (8.940)	3.256 (5.636)
NxT	237	237	224	228	228	237	237	237
Adj R-sq	0.865	0.866	0.897	0.878	0.877	0.886	0.864	0.889
Sectors	119	119	115	115	115	119	119	119

*Notes:* Observations are at the sector-period level. The dependent variable is the cumulative number of NTMs applied in a given sector-period (NTM cum). All regressions include period and sector fixed effects, and sector-specific time trends. Crony variable is based on broad definition of cronies. The estimation period is 2001-2011. Post dummy is equal to 1 if period is greater than 2004 and 0, otherwise. All models include average MFN tariff weighted by number of products. All variables are expressed in natural logs. Cluster-robust standard errors in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table A12: Difference-in-difference model with UNIDO controls – NTM new

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Initial crony count x Post	0.0774*** (0.0291)	0.0785*** (0.0289)	0.0830*** (0.0307)	0.0870*** (0.0287)	0.0893*** (0.0290)	0.0772*** (0.0295)	0.0730** (0.0294)	0.0761*** (0.0288)
Employees	0.0341 (0.0234)							0.0651 (0.0403)
Establishments		0.0703 (0.0726)						-0.0657 (0.115)
Output per firm			-0.0330 (0.0288)					
Employees per firm				0.0201 (0.0513)				
Value-added per firm					-0.0186 (0.0270)			
Employment concentration						-14.13 (11.19)		-18.46* (10.68)
Output concentration							2.880 (4.205)	5.187 (3.152)
NxT	237	237	224	228	228	237	237	237
Adj R-sq	0.608	0.607	0.633	0.630	0.631	0.619	0.607	0.632
Sectors	119	119	115	115	115	119	119	119

*Notes:* Observations are at the sector-period level. The dependent variable is the number of new NTMs applied in a given sector-period (NTM new). All regressions include period and sector fixed effects, and sector-specific time trends. Crony variable is based on broad definition of cronies. The estimation period is 2001-2011. Post dummy is equal to 1 if period is greater than 2004 and 0, otherwise. All models include average MFN tariff weighted by number of products. All variables are expressed in natural logs. Cluster-robust standard errors in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

### *Sample restriction*

In Table A13, we rerun our baseline DID model while restricting the sample to those sectors that witnessed a tariff cut in 2004 – the year of the EU-Egypt trade agreement . The logic behind this is that the trade agreement can only be considered a fully exogenous shock for those sectors whose tariffs are cut following the agreement. The results are robust to this sample restriction in all but two cases (column 2, 5), where they fail to reach conventional levels of statistical significance ( $p=0.127$  and  $0.158$  respectively). This reflects a consistent trend across all DID models which shows somewhat weaker results for the *NTM cum* measure, especially when used in a two-period setup (see previous section). We find it reassuring, however, that in column 1, the interaction term reaches, albeit weak, significance while including sector and year fixed effects as well as sector time trends. The loss of significance in column 2 is mostly attributable to the loss of observations when including further controls, which drop from 957 to 812. The same is also true for column 5: when we ran the two-period model on *NTM cum* without controls, the  $p$ -value of the interaction term drops to  $0.058$ .<sup>8</sup> This means that the loss of significance in columns 2 and 5 is most probably driven by listwise deletion.

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<sup>8</sup>Results available upon request.

Table A13: Difference-in-difference Model – sample restriction

	(1)	(2)	(3)	(4)	(5)	(6)
	NTM cum	NTM cum	NTM new	NTM new	NTM cum	NTM new
Initial crony dummy x Post	0.127* (0.070)	0.110 (0.071)	0.140** (0.0690)	0.148** (0.072)	0.110 (0.077)	0.068* (0.039)
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	0.755	0.778	0.466	0.489	0.862	0.639
Sectors	87	87	87	87	87	87
NxT	957	812	957	812	174	174

*Notes:* Observations are at the sector-year level. The sample is restricted to those sectors that witnessed a tariff cut in 2004. 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. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

*Bringing the crony treatment forward*

In this robustness test, we bring the classification of treated sectors further back to 1990. Defining treated sectors as those exposed to crony presence by 1990, nearly fourteen years before the EU trade agreement, we re-estimate our core DID specification. This yields a highly robust set of findings as displayed in Table A14 below. The parallel trends assumption is reproduced below from the main body of the paper and shown in Figure A1.

Table A14: Bringing the treatment classification forward to 1990

	(1)	(2)	(3)	(4)
	NTM cum	NTM cum	NTM new	NTM new
Initial crony count x Post	0.315** (0.157)	0.309** (0.153)	0.270** (0.118)	0.306** (0.129)
Controls	No	Yes	No	Yes
Sector trends	Yes	Yes	Yes	Yes
Adj R-sq	0.755	0.778	0.437	0.441
Sectors	119	119	119	119
NxT	1,309	1,102	1,309	1,102

*Notes:* 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. A sector is treated as crony if it was exposed to cronies until the year 1990. \* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$

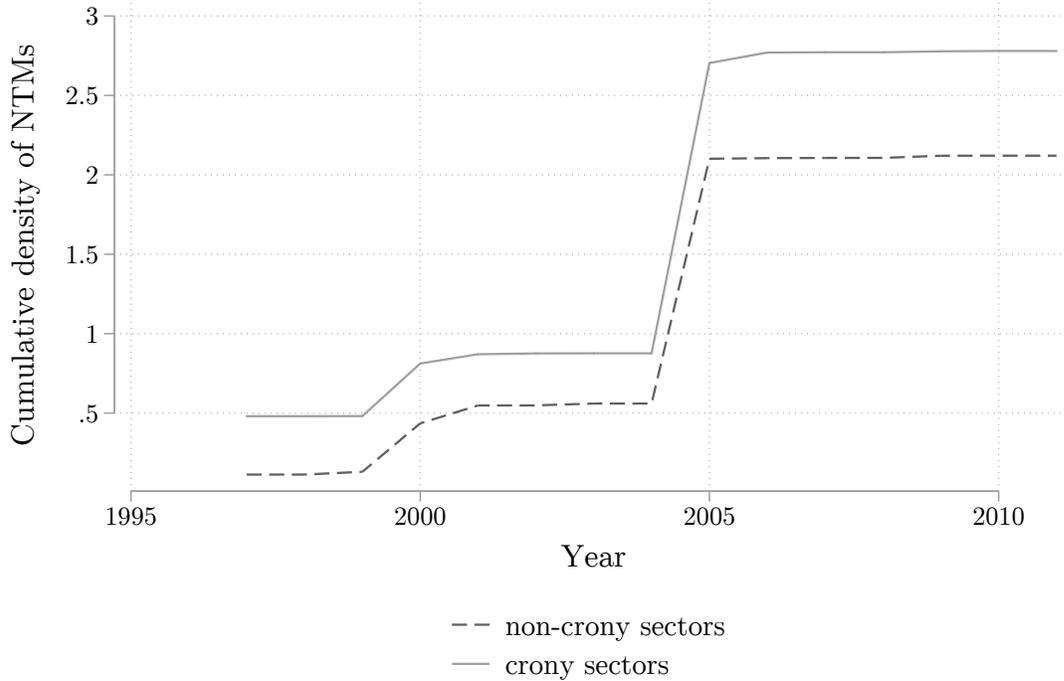


Figure A1: Parallel trends plots using 1990 crony cut-off

*Exclusion restriction*

In Table A15, we statistically test the validity of the exclusion restriction of our IV model by successively adding our instruments – *Neighbour-crony ratio* and *CronyTunisia* – as controls to our baseline annual DID model. We also test if trade protection in neighbouring sectors has any spill-over effect, which would invalidate the use of the neighbour-crony instrument. The results suggest that neither of the two instruments nor the level of trade protection in other sectors are affecting NTM protection other than through the crony variable. This is particularly reassuring in the case of the *Neighbour-crony ratio* as alleviates concerns about spill-over effects from crony activity in neighbouring sectors.

Table A15: Difference-in-difference model – test of exclusion restriction

	(1)	(2)	(3)
	NTM cum	NTM cum	NTM cum
Initial crony count x Post	0.182* (0.102)	0.120* (0.072)	0.109 (0.075)
Neighbour-crony ratio x Post	-0.080 (0.214)		
Neighbour-NTM cum x Post		0.034 (0.025)	
CronyTunisia x Post			0.143 (0.216)
Two-period	No	No	No
Controls	Yes	Yes	Yes
Sector trends	Yes	Yes	Yes
Adj R-sq	0.800	0.783	0.778
Sectors	60	87	87
NxT	560	812	812

*Notes:* 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 totalimports, exports and MFN tariffs, all measured in natural log and weighted by number of products. Crony variable is based on broad definition of cronies. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

*Tariff trends in crony and non-crony sectors*

One potential challenge for our identification strategy could be diverging trends in *tariff* protection prior to the EU-Egypt FTA, despite parallel trends in non-tariff protection. As Figure A2 below demonstrates, however, there was no noticeable divergence in terms of tariff protection in both types of sectors.

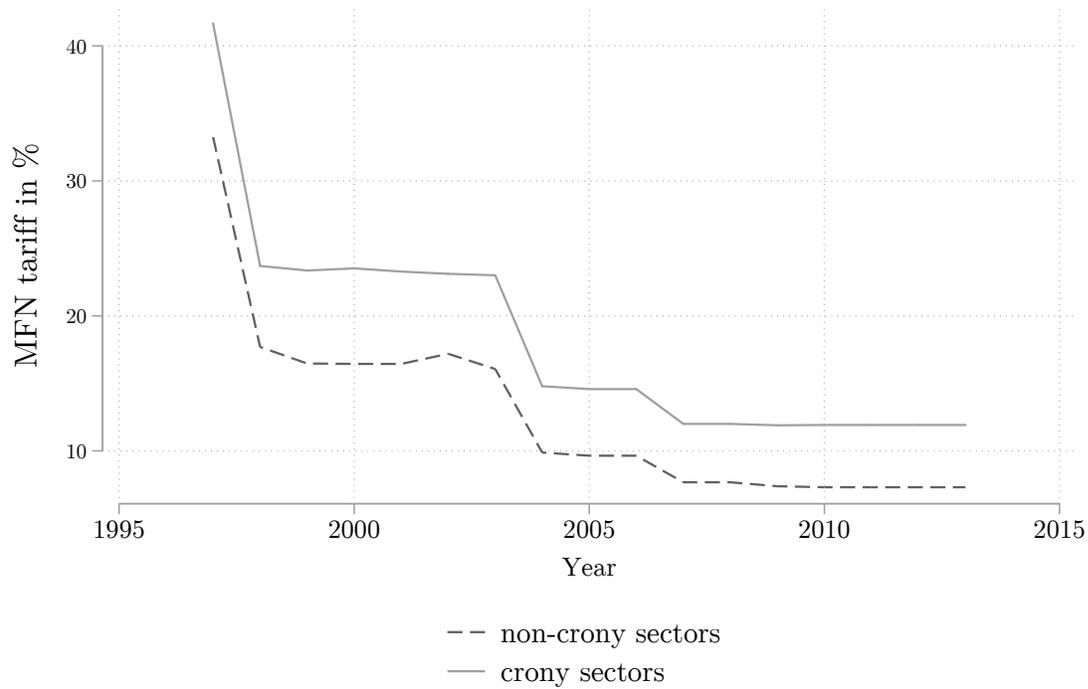


Figure A2: Tariff trends in crony and non-crony sectors

### *Tunisian crony data*

To collect data on crony activity in Tunisia, we adopted the following procedure: first, we compiled an initial list of politically connected entrepreneurs based on internal documents of the German Trade Invest (2011), a market research and consultancy company based in Tunis, and the German-Tunisian Chamber of Commerce (2011). The information contained in these reports relies on in-depth research carried out by their staff.<sup>9</sup> We then collected information on their companies and their activities at the ISIC4 level (Rev. 3.1), using the Orbis database (Bureau van Dijk, 2013). This results in a dummy indicator taking the value of 1 whenever a crony is active in a sector and 0 otherwise. Table A16 summarises the presence of cronies for each ISIC2 manufacturing sector in Tunisia and Egypt.

Table A16: Percentage of sectors (ISIC4) with crony activity by manufacturing sector (ISIC2)

Manufacturing Sector	Tunisia	Egypt
Food products and beverages	47	59
Tobacco products	0	80
Textiles	0	70
Wearing apparel	50	50
Tanning and dressing of leather	67	67
Wood products	80	40
Paper and paper products	33	32
Publishing and printing	0	56
Coke and refined petroleum products	0	30
Chemicals	11	62
Rubber and plastics	33	68
Other non-metallic mineral products	25	95
Basic metals	50	75
Fabricated metal products	60	65
Machinery and equipment	0	33
Office, accounting and computing machinery	0	0
Electrical machinery	0	68
Radio, television and communication equipment	33	78
Medical, precision and optical instruments	0	54
Motor vehicles	67	95
Other transport equipment	0	14
Furniture	17	68

Source: Own data.

<sup>9</sup>We are particularly grateful to Fausi Najjar at the German Trade Invest for generously sharing his data.

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