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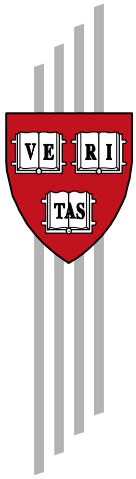

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1 Introduction

Countries in the Middle East have long relied on foreign workers for the production of goods and services in their economies. According to the ILO, the GCC region hosts 10% of all migrants globally, and has the highest proportion of non-nationals in the employed population (over 70%). In Saudi Arabia, home to the world's third largest migrant population, by the end of 2019 more than three quarters of the 13.4 million employed were foreign born.[1] The share of non-nationals employed is even higher in the rest of the Gulf. It exceeds 80% in Kuwait and Oman, and reaches almost 95% in Qatar.

The prevailing social contract has been one through which governments redistribute oil rents by securing jobs for their nationals in the public sector, while foreign workers are employed in the lower paid private sector, mostly in retail and construction.[2] However, as the reliance on oil to provide subsidies for the local families in the form of government employment became unsustainable, youth unemployment substantially increased, threatening the political stability of these countries. Governments therefore started to impose a series of nationalization policies on the labor force, with the objective of increasing the native employment in the private sector. These policies generally came in the form of quotas for native hiring or taxes on foreign hiring by private firms.

The effect of these types of policies on firms depend on a set of factors. Intuitively, any restriction on the hiring decisions of firms, without other policy changes, should make them worse off. The extent of the negative effects will depend on how foreign and native labor compare – in terms of price, ease of hiring, skills and productivity. The way in which firms react to the policy will ultimately determine its success. If firms are able to smoothly substitute native for foreign labor at a low cost, or to change their technology relatively easily, if they are not, the effect of the policy on costs and production decisions will not be large. However, if native labor is not a good substitute for foreign labor, or if it is much more expensive, then firms will adjust their operations, and potentially exit the market. Furthermore, it is possible that the policy backfires. If the negative effects on the firms are too large, then aggregate employment of natives might even shrink as many firms exit or reduce their size considerably.

In this paper, we study how a strict nationalization policy, the *Nitaqat* initiative in Saudi Arabia, affected non-oil firms in the private sector and the overall labor market. Our rich data allow us to look at a wide set of outcomes: employment decisions (composition and size), labor costs, and exit rates. In addition, we study the effects of the policy on the output and productivity of exporting firms.

[1] Source: GASTAT, based on GOSI and MCS data.
[2] The private sector has been historically undesirable for locals, for both cultural and financial reasons.

To estimate these effects, we take advantage of the policy design that sets a threshold for the minimum share of Saudi workers in a firm. The threshold is determined for combinations of industry and firm size and is set such that about half the firms in the bin are below it and half are above. Those below the quota face strong restrictions in their ability to hire foreign workers. Our empirical strategy is a simple difference-in-difference analysis comparing the change in outcomes between firms above and firms below the threshold.

Our empirical strategy identifies causal effects as long as the firms above the threshold provide a valid counterfactual for changes in the outcomes for firms below the threshold in the absence of the policy. We provide suggestive evidence that this is indeed the case by conducting event study (pre-trends) analysis of key outcomes.

Our results suggest that whereas the policy succeeded in encouraging firms to increase the share of Saudis in private firms, it came at a high cost. To conform with the policy, firms increased the number of Saudis hired but decreased the number of foreign workers disproportionately, resulting in a smaller total number of employees in the firm. Furthermore, complying with the policy was too high of a cost for some firms, forcing them to exit the market. Using data on wages, we find that the wage bill for firms below the threshold increased as Saudi wages are much higher than foreign wages. We also find that the average wage for Saudis decreased, suggesting that Saudis hired as a result of the policy were lower paid. Firms below the threshold increased the share of Saudi females in their workforce, suggesting that the policy had a positive effect on increasing the labor force participation of women.

Reducing the labor force when forced to hire higher paid workers would not be too damaging to firms if these workers are particularly productive. Data for exporting firms allow us to test this hypothesis. We find that total exports went down for firms below the threshold relative to those above, and that total exports per worker did not change significantly, or might have even decreased. These results combined with an increase in the wage bill suggest that the policy was very costly for firms.

In the last part of the paper our focus is on the aggregate labor market. Our analysis at the firm level suggests that surviving firms hired more Saudis. However, the policy also increased exit rates. Therefore, the aggregate effect could be positive or negative. Using the share of firms in a region x industry cluster that are below the threshold as a treatment variable, we find that overall the policy did significantly increase the number of Saudis in the labor market, but find some suggestive evidence that it also decreased the aggregate size of the labor force and increased the exit rates of firms.

Our paper contributes to two strands of the literature. The first is the literature on immigration and its effects on the host country. Most of this literature has focused on immigration inflows' impact on the

labor market outcomes of natives (see Dustmann et al (2016) for a recent survey). Our analysis, on the other hand, is at the firm level and focuses on how firms adapt to immigration restrictions. A handful of papers have explored how firms and regions are affected by immigration flows. Clemens, Lewis, and Postel (2018) study what happened to native employment and production when the Bracero Program, which allowed foreigners to work in agriculture in the US, was abolished. They find that restrictions on immigration did not increase the employment or wages of natives, and that firms adapted by developing new technologies. Lewis (2011) looks at how low-skilled immigration flows affected technology adoption. His results suggest that plants in areas with heavy flows of low-skilled foreign workers adopted significantly less machinery per unit of output. The results imply, as in Clemens, Lewis, and Postel that changes in production technology reduce the effect that immigration has on less-skilled relative wages and employment.

The second strand of the literature that our paper relates to is employment quota programs and affirmative action. Most of these studies have focused on the effect of these policies on workers (see Holzer and Neumark (2000) for a survey, Chay (1998) on African Americans in the US, and Howard and Prakash (2012), Chin and Prakash (2011), and Prakash (2009) for Indian Minority Hiring quotas.) There are a few studies that look at nationalization policies in the GCC countries. Hertog (2014) reviews the different Gulfization policies, with a specific focus on the ones that involve taxes and subsidies to close the gap between the cost of hiring nationals and migrant workers. He finds that micro interventions fail to solve the high unemployment problem as they are costly and not performed in a systematic way. Ramady (2013) discusses the tradeoff between higher (but costlier) Saudi employment in the Saudi private sector, and describes how economic growth and productivity could be affected if additional labor market restrictions (like a Saudi minimum wage) are applied. Sadi (2013) ran a survey to identify the main costs and benefits of Nitaqat to the Saudi private sector business owners. While there was optimism about the program success in general, most employers admitted to hiring Saudis just to fill quotas.

The closest study to ours is Peck (2017). As in our paper, she looks at the effect of Nitaqat on the exit of firms and the total employment at the firm level, and finds similar results. Our paper extends her study in several important ways. First, we conduct analysis at the labor market level to estimate the aggregate effect of the policy on total employment, Saudi employment, and foreign employment. Second, we look at measures of productivity and wages, which shed light on the relative productivity and cost of hiring foreign vs. Saudi labor. This analysis sheds light on the mechanisms that explain Peck's and our findings. Third, we look at changes in the gender and education composition of employment in the surviving firms to learn about the type of Saudis hired to comply with the policy and the contribution of the policy to increasing female labor force participation.

The rest of the paper is organized as follows. The next section describes the background that led to the introduction of the policy; section 3 describes our data sources, and presents descriptive statistics; section 4 lays out our different empirical specifications and tests; and section 5 concludes.

2 Background

Saudi Arabia has been a net importer of labor for much of its history, with a massive increase in inflows of foreign labor during the oil boom of the 2000s. This generated a dual labor market, with Saudis concentrated in the public sector and non-Saudis dominating the underdeveloped and non-tradable private sector. As of Q2 of 2019, 75 percent of the employed population was foreign, who in turn represent 80 percent of workers in the private sector. Saudization, the increase in Saudis' employment share in the private sector, has been a government objective since the 1970s. This goal has been translated into active labor market policies since 1995, but they were not strictly enforced until 2011 when the Arab Spring added urgency to them.

With about a quarter of the Saudi population between 15 and 29 and high youth and female unemployment, the government urgently designed redistribution measures in the aftermath of the Arab Spring. These included a massive housing subsidy program, unemployment benefits of SAR 2,000 per month for a year, and increase in the wages and jobs in the public sector. The government also put into effect stricter nationalization measures to incentivize private sector firms to hire Saudis. The Ministry of Social Development and Labor implemented Nitaqat (" bands" in Arabic) in 2011, a program that assigned Saudi hiring quotas for firms based on their industry and size. Firms were divided into 45 main economic activities and five size categories: micro (<10 employees), small (10-49), medium (50 to 499), large (500 to 2999) and giant (3000+). Micro firms were, in the beginning, exempt from the policy.

Within combinations of industry and firm size, three thresholds of Saudi shares were determined to classify firms into 4 color bands: red, yellow, green and platinum. The key threshold is between yellow and green, as firms above it are rewarded, and below it are subject to sanctions. This threshold was chosen so that a little less than half of the firms were below it, and the other two cutoffs were chosen in a more ad hoc fashion. It is important to note that this led to significant variation in quotas across sectors. As an example, below are the bands for the Wholesale and Retail Industries:

	Small	Medium	Large	Giant
Red	0-4%	0-4%	0-9%	0-9%
Yellow	5-9%	5-16%	10-23%	10-24%
Green	0-26%	17-33%	24-34%	25-36%
Platinum	27%+	34%+	35%+	37%+

The main source of benefits and costs for the different bands is the ability to access foreign labor. The policy mechanism for that was the speed and flexibility in the issuance of visas for foreign workers. Firms in the green and platinum bands could use new online services for visa renewal and issuance and could also hire foreign workers from the red and yellow bands. Firms in the yellow band could not use electronic visa services and faced some restrictions on their issuance. Firms in the red band could not renew their existing visas, and could not apply for new ones. Additionally, they could not open any new branches or facilities.

The purpose of these restrictions was to incentivize firms to increase their hiring of Saudi workers by making staying in the red band inviable. The policy also imposed certain requirements for what constitutes a "full" Saudi job. The position had to pay a salary of at least 3,000 SAR per month (around 3.5 times more than the average wage of expats), imposing an effective minimum wage for Saudi employees. The government supports up to 50% of the Saudi salaries for the first 2 years of their tenure up to a maximum of 2000 SAR through the Human Resource Development Fund (HRDF). Moreover, certain demographics, women and disabled Saudis, for example, were given higher preference by counting their job as a multiple for the purposes of Nitaqat.

The Nitaqat policy measures the nationalization performance of companies by calculating, over successive periods of 13 weeks, a moving average of the percentage of Saudi nationals employed by a firm. The policy was announced in July 2011, and came into effect in September of the same year. Enforcement was rigorous since the very beginning, as both the Ministry of the Interior and the social security agency updated visa records weekly.

The program is still in place, but underwent several modifications over time. In early 2014, the micro firms were included in Nitaqat, with the requirement that they employ at least one Saudi national. In 2017, quotas were significantly tightened and new color bands (i.e. light green, medium green, dark green) were created. In 2013, under increasing pressure to raise non-oil government revenues, the

government introduced an annual expat levy of 2400 SAR per foreign worker. Our paper studies the effects of Nitaqat 1.0, the first version, imposed between 2011 and 2012. This is the only period of time with no other overlapping policies, which makes it ideal to estimate the causal effects of the hiring quotas.

3 Data and Descriptive Statistics

In this paper, we make use of three main datasets, all provided to us by the Saudi government. The datasets provide firm-level data on Nitaqat performance (Nitaqat dataset), job spell and demographic characteristics of workers (General Organization for Social Insurance (GOSI)) and exporting firm characteristics (Customs dataset). We merged these datasets and constructed a panel of firms containing all the relevant characteristics before and after the program was implemented.[3] First, we will concentrate on the GOSI and Nitaqat datasets merge, and then we will include the export dataset to investigate the effect of the policy on exporters.

Nitaqat

The Ministry of Labor gathers administrative data on a weekly basis to follow the evolution of the program and administer rewards and penalties. The data series start in June 2011, when the quotas were introduced and firms were given their initial ratings. The data is at the firm level, primarily tracks the number of employees by nationality, and includes the band color of a firm at a given point in time. It also contains data on the geographic location of the firm, and its main industry. We will use these data to test the effects from the Nitaqat policy on the composition of firm's employees by nationality, the aggregate number of Saudi and non-Saudi employees at a more macro level, and its effect on the survival of firms.

Table 1 presents the descriptive statistics for the Nitaqat's sample of firms. Two thirds of the firms in the Kingdom had fewer than 10 employees and thus were not affected directly by the policy. Overall, we observe close to one hundred thousand firms with at least 10 employees in December 2011.[4] About forty percent of these firms are above the threshold for sanctions (green or gold bands), and close to eighty percent of those below are in the red category. The Saudi private sector is dominated by small firms: 86 % of the firms covered by Nitaqat have between 10 and 49 workers, 13% have between 50 and 500 and the remaining share of firms are large. Close to 50% firms are in the construction sector and 22% are in retail

[3] Matching rates vary by dataset. Whereas we are only able to match 36% of Nitaqat firms to GOSI, we can match close to 80% of firms in GOSI and 67% of firms in our custom data to Nitaqat.

[4] The coverage of firms improved significantly over the first few months of the implementation of the policy. That is why we focus on December 2011 as our base period.

and wholesale trade[5]. The average share of Saudis in a firm is very low at less than 8% percent with 50% of firms with no Saudi employees. Exit rates are 5 %.

GOSI

The Saudi General Organization for Social Insurance (GOSI) collects data on each job spell in the economy, covering the entire private sector and some public sector workers subject to the social insurance rules and regulations, such as those working for state-owned enterprises (SOEs). We were provided with the administrative records between 2009 and 2016. The GOSI data is very granular (at the job contract level) but can be easily aggregated to the individual or firm level. It includes basic demographic characteristics of each individual (gender, nationality, age, place of residence, education level) and characteristics of their job, such as occupation, wage, and the firm they work for. Since the GOSI data is collected regularly by the several GOSI offices across the country, regional coverage is very good.

Customs Data

The customs data was provided by the Ministry of Economic Planning and includes all export transactions in the Kingdom between May 2006 and June 2016. The data is at the transaction level - it records transactions for each exporting firm, export product, export market, quantity of export, value of export, and date of transaction. We aggregate the data at the firm and year level and drop oil exporting firms. We are able to merge the customs data with GOSI and Nitaqat and obtain the labor force and Nitaqat characteristics for exporting firms.

4 Empirical Specification

4.1. Firm Level Estimates

4.1.2. All Firms

Our empirical strategy is a simple difference regression that compares changes in the composition of a firm's workforce between firms that were over the threshold to those below the threshold for a green band classification in December 2011. We explore the difference between December 2011 and December 2012.

[5] Similar numbers are obtained when constructing the share of workers. When looking at the whole labor force (including the public and domestic workers sector), more than 26% of workers in the Kingdom work in construction – a very large share compared, for example, with the US, where the share is just 6%. The share of workers in retail and wholesale (17%) is closer to that in the US (14%).

Before moving to the econometric specification, it is helpful to look at the characteristics of firms that were below the threshold (treated firms) and compare them to those above the threshold (control firms). Table 2 presents descriptive statistics by treatment status, for two samples of firms: all firms, and those in the middle two bands (yellow and green). As expected, given that the share of Saudis in a firm is not randomly assigned, firms above and below the threshold are quite different. In particular, firms above the threshold are significantly larger in terms of number of employees, even if thresholds are determined at the firm size range level. Firms above the threshold hire both more Saudis and foreigners, and are more likely to be located in the capital region of Riyadh. When we focus on the middle two bands, differences between treatment and control regions are much smaller. In particular, we do not observe significant differences in size, although naturally, firms above hire relatively more Saudis and fewer foreigners. We also find that firms in the green band are less likely to be located in the Makkah region.

Note that our empirical strategy does not require characteristics between treatment and control firms to be similar in *levels*, what is required is similar changes over time. We will present results for both samples, with the argument that the identification assumption of similar trends in the absence of the treatment, is more likely to hold for the sample of firms in the middle bands. Additionally, for exporting firms we present direct evidence on the validity of the identification assumption.

Our main econometric specification is the following:

$$\Delta Y_{ijrs} = \alpha + \beta * Below_{ijr} + \pi_J + \pi_r + \pi_s + \varepsilon_{ijrs} \quad \textbf{(1)}$$

where *i* is for firm, *j* is for industry group, *r* is for region and *s* for firm size. *Below* is a dummy variable equal to one if the firm was assigned yellow or red Nitaqat bands in 2011. The coefficient of interest is β, while π_J , π_r and π_s , stand for industry, region and size fixed effects. Y_{ijt} are firm outcomes and include, among others, employment levels by nationality, the wage bill and a dummy for exiting the market. This last variable is equal to one for firms that appear in the data set in 2011, but not in 2012. Given the large variation in firm size, we present specifications in which we weigh observations by the number of total employees in the firm in 2011. Finally, we show specifications in which we restrict the sample to yellow and green firms, which as mentioned before are arguably more comparable than those with more extreme shares of Saudi employees in either direction. Micro firms are not included as the policy did not affect them.

Table 3 presents the results of estimating equation (1) for outcomes included in the Nitaqat data. Note that each number comes from a different regression, and specifications presented in the different columns vary by the fixed effects included, whether weights were used, and the sample size. The first dependent variable that we study, is the most direct objective of the policy: Saudization rates. In all specifications, the coefficient of the *Below* dummy is positive, as expected, and statistically significant. The magnitudes of the coefficients suggest that firms that faced potential penalties based on their assigned color increased their share of Saudis in the labor force by between 3 and 5 percentage points, depending on the specification. Smaller coefficients in the weighted regressions suggest that the change in Saudization shares were smaller for the larger firms. This is due to larger firms having, on average, higher Saudi shares. Similarly, the *Below* coefficient decreases significantly when we keep only the two middle quota colors in the sample, dropping the red firms. The latter have the lowest Saudi shares and therefore need the largest share increases to comply with the quotas. As observed, adding controls has little effect on the magnitude of the coefficients; this is not surprising as bands were defined within industries and size ranges, though not within regions.

So far, these results strongly suggest that, at face value, Nitaqat was successful since it led firms to significantly increase the share of Saudis in their workforce. Firms that were below the quota in 2011 had to increase their Saudization ratios to keep operating in 2012. This is not surprising as the program was strictly enforced, with severe penalties for non-compliers. The next two outcomes, changes in the (Log) number of Saudis and foreigners hired by firms, explore the mechanisms through which these higher Saudization shares were attained. Results suggest that firms below the threshold quota increased their number of Saudi employees, decreased the number of non-Saudis, and decreased the total number of workers. As expected, the effect is smaller when we exclude from the sample the firms farther away from the threshold. On average, affected firms reduced their overall workforce between 8 and 20 percent[6].

All in all, the estimates reveal that Nitaqat induced firms to raise their Saudization rates through both increasing the number of their Saudi workers and reducing the number of expat workers. It should be noted, however, that these results are conditional on firm survival. The last outcome that we study in Table 3 is firm exit. We find that firms below the threshold were between 0.5 to 1.8 percentage points more likely to exit the market between December 2011 and December 2012. These magnitudes are not small, when compared with the average exit rate of 4 percent. Overall, these results showcase the existence of two different effects on firms below the threshold, which move in opposite directions. On the

[6] Since expats comprise most of the Saudi private sector, the decrease in expat workers is expected to result in a decrease of total employment.

one hand, firms increase their Saudization rates through hiring more Saudis. On the other hand, firms below the threshold are more likely to shut down, which implies loss of Saudi jobs.

Our results are in line with Peck (2017), who finds that the large Saudization increases for firms below the quota were mostly achieved through Saudi hiring. She also finds firm shrinkage and exit over a 16-month period.

GOSI data from the social security administration allow us to do a deeper analysis of the changes experienced by firms and their coping strategies as a result of the Nitaqat policy. In particular, we look at the effects of the policy on labor expenditures and on the gender and skill composition of their labor force.[7] The direction of the change in the wage bill for firms below the threshold is ambiguous – they reduced the number of workers but hired relatively more expensive ones. The first row of coefficients in Table 4 suggests that the total wage bill went up for firms below the threshold compared to those above. When all the firms are included in the sample, the wage bill goes up by approximately 8 percent, and the coefficient is statistically significant. We find smaller and not precisely estimated effects when the sample is restricted to firms in the middle bands.

What kind of Saudi workers were hired to comply with the policy? Our result that the policy decreased the average wage paid to Saudi hires suggests that the new hires were low-paid. Average Saudi wages decreased by between 2 and 3 percent in firms below the threshold compared to those in firms above. The next two rows show that the employment of low-skilled Saudis (those with at most high school) increased more than that of high-skilled Saudis. Finally, in the last row we find that, as a result of the policy, firms below the threshold increased the share of women in their labor force. The effect of Nitaqat on this outcome is not small; firms below the threshold increase the female share by 1.5-2 percentage points or between 15 to 20% of the observed change for all firms between 2011 and 2012.[8]

4.1.1.2 Heterogeneous Effects

In this section we explore if Nitaqat's effects on firms vary by firm size and industry. We start by looking at heterogeneous effects by size by running the following specifications:

[7] Note, however, that we lose a large share of our sample in the match.

[8] The average female share for all firms was 11 percent in 2011 and 20 percent in 2012.

$$\Delta Y_{ijrs} = \alpha + \beta_1 * Below_{ijrs} + \beta_2 * Below_{ijrs} * I\left(Size_{ijrs} = Medium\right) + \beta_3 * Below_{ijrs} * I\left(Size_{ijrs} = Large\ or\ Giant\right) + \pi_J + \pi_r + \pi_s + \varepsilon_{ijrs} \quad \textbf{(2)}$$

As observed, we allow for the effect of being below the threshold to vary by firm size. Table 5 presents the estimations of equation (3) using as outcomes the change in Saudi and total employment levels and a dummy for exiting the market. All our regressions are weighted by the number of employees in the firm. Estimates from our specifications suggest that medium size firms were the ones that increased the hiring of Saudis by the largest percentage, and at least in the restricted sample of firms in the middle bands, larger firms did not reduced their total employment by as much (in percentage terms) as smaller firms. The final two columns of the Table 5 show that smaller firms (10-50 employees) experienced a larger increase in their probability of exiting the market, and that for the largest firms, the effect of being below the threshold on exiting was close to null.

It should be noted that the vast majority of expat-only companies were micro and small. These results support Peck (2017)'s finding that Nitaqat most negatively affected the firms that did not have any Saudi employees when the policy was implemented.

Next, we look at the heterogeneity of Nitaqat effects by sector. We concentrate on differences across the three largest sectors: construction, retail and wholesale, and other. We run specifications similar to (3), but the interaction terms are instead with construction and retail dummies. Table 6 presents the results. Overall, we do not see consistent difference across the sectors, although there is suggestive evidence that the construction sector was the most negatively affected. The interaction coefficient is negative for total employment, and positive for the probability of exit, but are only statistically significant for the sample that includes all firms.

4.1.2 Exporter firms

4.1.2.1 Descriptive Statistics

In this section, we concentrate on how immigration restrictions affected an important subset of firms: exporting firms. We focus on exporting firms for a few reasons. First, a large literature suggests that exporter firms are "better" than non-exporter firms: exporters tend to be dramatically larger, more productive, more technology- and capital-intensive, to pay higher wages, and use more skilled workers than their non-exporting counterparts (Bernard 2006). Therefore, they provide a benchmark for the best-case scenario of a negative shock to firms. Second, we have access to data with productivity measures for

exporter firms in Saudi Arabia – in particular, we have information on the value, weight and quantity of export production for an extensive period of time (2006-2016).

Table 7 presents the comparison of exporter vs. non-exporters private firms in Saudi Arabia that were operating in 2011. Exporter firms represent a small share of firms in the Kingdom, around 1 percent of all firms and 11% percent of manufacturing firms compared to 29 percent of US manufacturing (Census). Not surprisingly, exporter firms are concentrated in the manufacturing sector (50 percent), followed by Retail and Wholesale, whereas most non-exporting firms operate in the construction sector. Exporting firms are larger on average than non-exporting firms – in particular, there are relatively much fewer firms in the micro category, and many more are medium-sized. In terms of geographic distribution, exporter firms are more concentrated in the largest regions of Riyadh and Makkah. Export firms have a larger Saudi employment share than non-exporting firms, even conditional on industry. They are also much less likely to be below the Nitaqat threshold, suggesting that they rely much less on foreign labor compared to non-exporting firms in the same industry and of the same size range.

Next, we study the characteristics of exporting firms that were above and below the Nitaqat threshold in December of 2011, the two groups of firms we will be comparing in our empirical strategy. As observed in Table 8, exporting firms below the threshold are on average different than those above the threshold in important dimensions: the value (and weight) of their exports is significantly lower, they hire fewer Saudis, more foreigners and have many more employees.[9] Much smaller differences are found in the main sector of operation and geographic location. A one order of magnitude difference between the value of exports between the two types of firms seems problematic. Looking carefully at the data we found a handful of firms above the threshold that were exporting much larger quantities than the rest. When we drop firms at the bottom and top 5% in export values, the difference in exports decreases substantially.[10] Note that differences in levels are not problematic for our empirical strategy as long as the trends are similar. We will provide evidence on parallel trends in section 4.1.2.3.

4.1.2.2 Empirical Analysis

We follow the same empirical strategy as in section 4.1.2 for identifying the effects of Nitaqat on exporter firms: we compare changes in our outcomes of interest between exporter firms below and above the

[9] Note that there is no inconsistency in having much lower export values and larger firms, as exports might represent a very different share of production in firms below vs. above the threshold. Unfortunately, we do not have data to test this hypothesis.

[10] In Table 9, we present robustness tests of our main results restricting the sample to the middle 90% in terms of export values.

threshold. As before, we present specifications in which we allow the change to vary by firm size, region and sector (i.e. include size, region and sector fixed effects in the difference regressions). We focus on three sets of outcomes: (1) labor composition and size of the firm's labor force, (2) productivity, and (3) labor costs. Unlike the sample that includes all firms subject to social security in the private sector in Saudi Arabia, the customs data has very few exporter firms that are micro-sized, and thus the rationale for weighting the specifications is not so clear. Given that our interest is what Nitaqat does at the level of the firm and to prevent a few giant firms from driving our results, we focus on specifications that do not use weights.

Table 9 presents the regressions for all our outcomes, divided by the source of the data. Panel A focuses on outcomes derived from the Nitaqat data, Panel B from the Customs data and Panel C from the GOSI data. For each outcome we present three specifications: one without controls, another with controls and one with controls but the sample excludes firms with extreme exports value. The first clear result is that firms below the threshold (those facing penalties for having relatively too many foreign workers) increased the relative size of the Saudi workforce in their firms. The magnitudes suggest that firms that were below the threshold increased their share of Saudi employees by around 7 percentage points, an effect that is similar in size to that of specifications that include all firms (exporter and non-exporter firms). This represents a large change, as the average Saudi employment share for exporting firms is close to 20 percent. The second and third rows of coefficients suggest that the increase in the Saudi share in employment was driven by two mechanisms. First, firms that were below the threshold increased the number of Saudi employees by between 34 and 42 percent, depending on the specification. Second, firms below the threshold reduced the number of foreign workers by around 23 percent. The increase in the number of Saudi employees does not fully offset the reduction in the number of foreign workers, so that on average, firms below the threshold see a decrease in the total number of workers by around 14-15 percent (fourth row). This effect is smaller than the one estimated for the whole sample of private firms of 19 percent. We find effect on exit rates of similar magnitude to those for the whole sample, but they are not statistically significant.

In Panel B of Table 9 we study productivity outcomes. The first row presents the models for the probability of not exporting in 2012. We find strong effects of Nitaqat on the exporter firms' probability of stop exporting. Firms below the threshold were between 6 and 8 percentage points more likely to stop exporting between 2011 and 2012. For firms that continue to export, firms below the threshold reduced the value of their exports by between 22 and 29 percent. Note that this result does not follow directly from the reduction in the labor force, as Nitaqat affected labor composition, and there might be productivity

differences between Saudi and non-Saudi workers. Further evidence pointing to a decrease in productivity is presented by the results of the specification where the outcome variable is the weight of exported goods. We observed a reduction of approximately 30 percent in the weight of export goods of firms below the Nitaqat threshold. Finally, the last row show the effect on exports per worker. The coefficient is negative and not small, but is not statistically significant. The magnitude of the coefficient is what one would expect, given the estimated reduction in the labor force and the larger decrease in total exports. With the caveat that the coefficient is not precisely estimated, the finding of a negative effect of productivity per worker suggests that Saudis are likely less productive than non-Saudi workers.

Next, we move to study how Nitaqat affected firms' cost, in particular their wage bill. Using aggregated data from GOSI at the year x firm level, we construct the total amount paid to workers during the year. We combine these data with the number of Saudi workers in a year to construct a measure of average salary of a Saudi worker. The coefficients in the first row of Panel C suggest that firms below the threshold increased their wage bill by between 8-10 percent, despite reducing the size of their labor force. This is not surprising given that the firms substitute some of the foreigners with Saudis, who are paid a higher wage on average. The row below presents the results on average wages for Saudis paid by exporting firms. We find strong evidence of a decrease in the average wage of Saudis by approximately 5 percent, suggesting that firms below the threshold hired low-wage, and therefore most likely low-skilled Saudi workers, to conform with Nitaqat requirements. We confirm that firms below the threshold increased substantially their hiring of low-skilled Saudis (those with at most a high school education), but did not change their hiring of high-skilled Saudis relative to firms above the threshold. The final outcome that we look at is the share of females in the firm's Saudi employees. Coefficients suggest that the policy had a positive effect in getting more women to work in the Saudi exporting sector.

4.1.2.3 Event Study Analysis

In this section, we present suggestive evidence on the validity of the key identifying assumption of our design — firms above and below the Nitaqat threshold experienced similar trends in the main outcome before the implementation of the policy. If this is the case, then, the firms above the threshold would be a good counterfactual for the firms below the threshold.

Data availability restricts the tests we can perform. In particular, the Nitaqat data on employment was collected for the implementation of the policy, and thus, lacks information for the preceding period. We do have data for a few previous years on exports from the Customs dataset, and data since 2009 from GOSI.

Figure 1 presents the raw data for value of exports. As observed, and noted before in section 4.1.2.1, characteristics of firms above and below differ in levels. However, they are much more similar when trends are considered. In Figure 1, firms both below and above the threshold see their exports increase between 2009 and 2011. However, between 2011 and 2012, after the policy was implemented, average export values and weights go down for firms below the threshold and go up for firms above the threshold. The graph for the wage bills trends (Figure 3A) is less stark, but it also shows parallel trends before 2011, and a steeper increase in the wage bill for the firms below the threshold relative to those above.

For a more rigorous analysis, we compare "treatment" effects by year. More specifically, we estimate the following model:

$$\Delta Y_{it} = \alpha + \beta_t * \sum_t Below_i * I(Year = t) + \pi_t + \varepsilon_{it} \quad \textbf{(3)}$$

In Figure 2 we graph the estimates for the betas and their 95% confidence intervals. As observed, there are small and not statistically significant differences between the change in the log of export value and weight between firms above and below the threshold in years before the implementation of the policy, i.e. 2008, 2009, 2010 and 2011. We estimate negative and statistically significant coefficients for 2012, confirming the results presented in Table 9. The treatment effect for 2013, though negative, is not statistically significant. We can think of two potential explanations for the smaller coefficient for 2013. First, there is an issue of survivorship bias. We know from Table 10, that the policy led to relatively more firms below the threshold dropping out of the exporting market in 2012. If this effect continued for the next year, we have an even more selected sample of firms surviving, and thus the change in composition can explain the smaller differences with firms above the threshold. Second, there were some policies implemented during 2013 that might have contaminated our results. Figure 2 uses all available observations. Because firms enter and exit the market at different times, the sample used for the identification of the betas varies somewhat by year. To address concerns about the biases that an unbalanced panel might introduce, in Figures 2C and 2D, we present estimates of equation (4) that restrict the sample to firms that participated in the market for the period 2009-2013 — close to 60% of all firms. The sample of firms operating since 2007 is too small for reliable estimation. We observe similar patterns as those estimated with the full sample — no evidence of pre-trends — but the treatment effect for 2012 is not statistically significant and smaller for the value of exports.

Next, we move to the event study analysis for wage bills using GOSI data. As mentioned before, our time series is shorter, but we have at least a couple of periods to test for differences in pre-trends. Estimation of equation (4) presented in Figure 3B shows that while there were small and not statistically significant differences in the change in wage bills between the two types of firms in 2010 and 2011, from 2011 to 2012 the wage bill in firms below the threshold increase at a much higher rate than for those below the threshold. This differential change is statistically significant. As in the case of exports, the treatment effect for 2013 is small and no longer statistically significant.

4.2 Labor Market Estimates

To understand the aggregate effects of the Nitaqat policy, we move to study employment and its composition at the level of the labor market, defined at the region x major industry level[11]. Our specification is as follows:

$$\Delta Y_{jr} = \alpha + \beta * Share\_Below_{jr} + \delta_s \sum_s Share\ Size\ s_{jr} + \pi_r + \pi_j + \varepsilon_{jr} \quad \textbf{(4)}$$

Where $Share\_Below_{jr}$ is the weighted share of firms in that industry-region cell that were below the Nitaqat threshold in December 2011, and $Share\ Size\ s_{jr}$ is the share of firms in the cell of a given size *s*. As before, π_j and π_r represent industry and region fixed effects. We use weights to construct the main explanatory variables and some of the outcomes, hypothesizing that what happens to larger firms should have a bigger effect on the aggregate outcomes of the labor market. Given the significant variation in the size of cells, in some specifications we use weights in our estimations.

Table 10 presents the results of the estimations at the labor market-level. Like the firm-level regressions, they reveal an increase in the Saudization rate in regions and industries where more firms were classified below the threshold in 2011. We also estimate a positive and statistically significant effect on the number of hired Saudis. This is reassuring, as it suggests that the increase in hiring nationals by surviving firms compensated for the loss coming from exiting firms. The magnitudes of the coefficients suggest that a standard deviation higher in the share of firms below the threshold implies a 7 to 14 percent increase in the number of Saudi employees in the labor market. We find mixed results on the total size of the labor force – we find a net decrease in the specification that does not use weights, but find no statistically significant effects in the other two specifications. We find suggestive evidence of an increase in exit rates

[11] Unlike in the previous analysis, we include micro firms (those with 10 or fewer employees that were not affected by the policy) when we aggregate at the labor market level.

in markets that were more negatively affected by Nitaqat, but the coefficient is statistically significant only when fixed effects are not included.

5 Conclusion

Nationalization policies, and specifically Nitaqat, intend to increase Saudi employment in the private sector, which Saudi citizens have consistently avoided to either pursue or queue for higher paid jobs with better working conditions in the public sector. Our analysis shows that the policy did indeed increase the number of Saudis working in the private sector, but that this achievement came at a significant cost for firms, and for the economy as a whole. The unintended consequences of the policy were a reduced labor market, increased firm exit, and reduced competitiveness in the most productive segment of the private sector - exporting firms. This increased costs and reduced export volumes makes it more difficult to achieve the ambitious diversification goals of Vision 2030.

Our results also provide evidence on the relative quality of Saudi and foreign workers. In particular, our findings suggest that Saudi workers' higher salary was not close to being compensated by higher worker productivity – if anything, our estimates point to a decrease in productivity per worker. To comply with the quotas, firms seemed to have increased the hiring of low-paid, low-skilled Saudi workers. This result suggests that, unlike the rationale for other quota policies, for example affirmative action in the US, the low representation of Saudis in the private sector is not due mainly to high fixed costs in identifying high quality workers.

A positive outcome of the policy, besides the increase in overall Saudi employment, is the relative increase in the share of female workers in firms. Saudi Arabia has long been characterized by one of the lowest female labor force participation rates in the world, and any advancement in incorporating half of the population into the market economy is beneficial.

Our analysis focuses in the short term – we look at changes after one year of the implementation of the policy. A longer-term analysis will uncover other adjustment mechanisms implemented by firms. For example, one such mechanism could be changes in technology to lower the need for the now more expensive labor input in favor of more capital (see Lewis 2011 and Clemens, Lewis and Postel, 2018). Additionally, as firms and Saudi workers learn about each other, Saudi workers' productivity might increase, as well as the information to future workers about the skills needed in the private sector.

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Table 1: Descriptive Statistics at the Firm Level

	Mean	Std. Dev.
Share of Micro firms (<10 employees)	0.65	0.43
Sample Affected by Nitaqat*		
Band distribution		
Platinum	0.041	0.197
Green	0.378	0.485
Yellow	0.141	0.348
Red	0.441	0.497
Size distribution		
Small (10-49)	0.836	0.370
Medium (50-499)	0.141	0.348
Large (500-2999)	0.019	0.135
Giant (3000 +)	0.004	0.066
Industry distribution		
Construction	0.394	0.489
Wholesale and Retail Trade	0.279	0.449
Other	0.327	0.469
Employment characteristics		
Total number of workers	42.260	544.100
Saudi Share	0.099	0.186
Exited the market between 2011 and 2012	0.045	0.207

Number of Observations is 126699. Characteristics are measured in December 2011. *The sample excludes micro firms.

Table 2: Firm Characteristics by Nitaqat Band

	Sample					
	All			Green & Yellow		
	Above	Below	Difference	Above	Below	Difference
Saudi Employees	12.26	1.701	10.56***	8.235	4.282	3.953***
	(257.2)	(42.94)		(57.31)	(84.55)	
Foreign Employees	47.01	28.34	18.67***	48.95	53.27	-4.319
	(356.3)	(540.7)		(371.9)	(1090.8)	
Total Employees	59.27	30.04	29.24***	57.19	57.55	-0.366
	(486.8)	(581.6)		(411.9)	(1173.7)	
Share Saudis	0.174	0.0452	0.129***	0.142	0.0572	0.0843***
	(0.228)	(0.124)		(0.189)	(0.132)	
Share in Riyadh	0.285	0.259	0.0254***	0.281	0.288	-0.00653
	(0.451)	(0.438)		(0.450)	(0.453)	
Share in Makkah	0.236	0.233	0.00230	0.229	0.269	-0.0407***
	(0.424)	(0.423)		(0.420)	(0.444)	
Share Eastern Region	0.0509	0.0535	-0.00260*	0.0530	0.0537	-0.000701
	(0.220)	(0.225)		(0.224)	(0.225)	
Number Obs.	52985	73714		47926	17726	

Standard deviations in parenthesis. *** p<0.01, ** p<0.05, * p<0.1

Table 3: Nitaqat Bands and Firm Outcomes - Nitaqat Data

	Coefficient on Below Indicator Var:					N. Observations	
	(1)	(2)	(3)	(4)	(5)	(1) to (3)	(4) and (5)
Dependent Var:							
Saudi Share	0.053***	0.042***	0.040***	0.030***	0.031***	120,991	63,080
	(0.001)	(0.003)	(0.003)	(0.004)	(0.003)		
Δ Log Saudi Employment	0.145***	0.328***	0.320***	0.276***	0.278***	120,991	63,080
	(0.003)	(0.038)	(0.041)	(0.075)	(0.063)		
Δ Log Foreign Employment	-0.214***	-0.253***	-0.259***	-0.124***	-0.118***	120,991	63,080
	(0.004)	(0.019)	(0.018)	(0.017)	(0.016)		
Δ Log Total Employment	-0.151***	-0.191***	-0.195***	-0.091***	-0.085***	120,991	63,080
	(0.003)	(0.014)	(0.013)	(0.013)	(0.013)		
Dummy Exit by 2012	0.018***	0.012***	0.009***	0.004***	0.005***	126,699	65,652
	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)		
Fixed Effects Included	No	No	Yes	No	Yes		
Weighted	No	Yes	Yes	Yes	Yes		
Sample	All	All	All	Green & Yellow	Green & Yellow		

Robust Standard errors in parenthesis. Each number comes from a different regression. Fixed effects included are economic activity fixed effects, region fixed effects and size fixed effects. Weights are the total number of employees in 2011. *** p<0.01, ** p<0.05, * p<0.1

Table 4: Nitaqat Bands and Firm Outcomes - GOSI Data

	Coefficient on Below Indicator Var:					No. Obs	
	(1)	(2)	(3)	(4)	(5)	(1) to (3)	(4) and (5)
Dependent Var:							
Δ Log Total Wage Bill	0.079***	0.101***	0.073***	0.031	0.049	57,719	30,084
	(0.005)	(0.031)	(0.023)	(0.044)	(0.032)		
Δ Log Avg Wage Saudi	-0.000	-0.025*	-0.031**	-0.024	-0.029*	40,377	26,409
	(0.003)	(0.015)	(0.013)	(0.021)	(0.017)		
Δ Log Saudi Employment Low Skilled	0.100***	0.160***	0.154***	0.115***	0.133***	57,719	30,084
	(0.004)	(0.030)	(0.027)	(0.045)	(0.037)		
Δ Log Saudi Employment High Skilled	-0.001	0.070**	0.088***	0.122**	0.116***	57,719	30,084
	(0.002)	(0.033)	(0.026)	(0.048)	(0.038)		
Δ (Female Saudi/Total Saudi)	0.028***	0.017**	0.015***	0.004	0.011*	40,377	26,409
	(0.002)	(0.008)	(0.004)	(0.009)	(0.006)		
Fixed Effects Included	No	No	Yes	No	Yes		
Weighted	No	Yes	Yes	Yes	Yes		
Sample	All	All	All	Green & Yellow	Green & Yellow		

Robust Standard errors in parenthesis. Each number comes from a different regressions. Fixed effects included are economic activity fixed effects, region fixed effects and size fixed effects. Weights are the total number of employees in 2011. *** p<0.01, ** p<0.05, * p<0.1

Table 5: Heterogeneous Effects of Nitaqat Bands by Firm Size

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent Variable					
	Δ Log Employed Saudi		Δ Log Employed Total		Exited between 2011 and 2012	
Below	0.192***	0.249***	-0.199***	-0.108***	0.014***	0.011***
	(0.005)	(0.008)	(0.004)	(0.007)	(0.001)	(0.002)
Below * Medium	0.257***	0.048**	-0.040***	0.006	-0.001	-0.005*
	(0.018)	(0.020)	(0.013)	(0.014)	(0.002)	(0.003)
Below * Large	0.123	0.033	0.039	0.041*	-0.010***	-0.009***
	(0.104)	(0.121)	(0.032)	(0.024)	(0.002)	(0.002)
No. Obs	120,991	63,080	120,991	63,080	126,699	65,652
Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Weighted	Yes	Yes	Yes	Yes	Yes	Yes
Sample	All	Green & Yellow	All	Green & Yellow	All	Green & Yellow

Robust Standard errors in parenthesis. Each column comes from a different regressions. Fixed effects included are economic activity fixed effects, region fixed effects and size fixed effects. Weights are the total number of employees in 2011. *** p<0.01, ** p<0.05, * p<0.1

Table 6: Heterogeneous Effects of Nitaqat Bands by Industry

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent Variable					
	Δ Log Employed Saudi		Δ Log Employed Total		Exited in 2012	
Below	0.293***	0.219***	-0.172***	-0.094***	0.010***	0.006***
	(0.026)	(0.027)	(0.019)	(0.019)	(0.002)	(0.002)
Below *Retail	0.042	0.108	-0.017	0.024	-0.004**	-0.003
	(0.067)	(0.118)	(0.028)	(0.027)	(0.002)	(0.002)
Below * Construction	0.023	0.002	-0.085***	-0.027	0.007**	0.002
	(0.048)	(0.043)	(0.028)	(0.030)	(0.003)	(0.003)
No. Obs.	120,991	63,080	120,991	63,080	126,699	65,652
Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Weighted	Yes	Yes	Yes	Yes	Yes	Yes
Sample	All	Green & Yellow	All	Green & Yellow	All	Green & Yellow

Robust Standard errors in parenthesis. Each column comes from a different regression. Fixed effects included are economic activity fixed effects, region fixed effects and size fixed effects. Weights are the total number of employees in 2011. *** p<0.01, ** p<0.05, * p<0.1

Table 7: Comparison of Exporting and non-Exporting Firms, 2011

	Exporters	Non-Exporters
Size		
Micro (1-9)	0.087	0.558
Small (10-49)	0.286	0.362
Medium (50-499)	0.492	0.071
Large (500-2999)	0.121	0.008
Giant (3000+)	0.013	0.001
Sector		
Agriculture	0.025	0.003
Mining and Oil	0.028	0.006
Manufacturing	0.504	0.068
Electricity, gas and water	0.017	0.002
Construction	0.056	0.550
Retail and Wholesale	0.223	0.230
Post and telecommunications	0.019	0.014
FIRE and Business Services	0.100	0.083
Other Social services	0.026	0.045
Other activities	0.002	0.000
Region		
Riyadh	0.387	0.290
Makkah	0.342	0.210
Madinah	0.026	0.059
Al-Qassim	0.021	0.081
Eastern Region	0.211	0.193
Asir	0.004	0.058
Tabuk	0.002	0.018
Hail	0.001	0.023
Northern Borders		0.008
Jazan	0.002	0.007
Najran	0.001	0.025
Al-Bahah		0.013
Al-Jawf	0.002	0.015
Share Saudi*	0.208	0.105
Share Below Threshold*	0.255	0.542
Number of Observations*	1334	129209

* Excludes Micro firms

Table 8: Descriptive Statistics for Exporting Firms by Nitaqat Status - 2011

	Sample					
	All Firms			Minus bottom and top 5% *		
	Above	Below	Difference	Above	Below	Difference
Total Exports (Millions of SARS)	37.82	3.706	34.12**	3.851	2.073	1.777***
	(233.9)	(14.33)		(7.814)	(5.471)	
Total Exports (Millions of Kilos)	34.85	1.258	33.59**	2.234	1.099	1.136**
	(240.2)	(3.882)		(7.377)	(3.304)	
Saudi Employees	85.90	47.02	38.88	56.56	47.49	9.072
	(369.9)	(530.0)		(220.0)	(547.1)	
Foreign Employees	242.6	479.7	-237.1	227.5	494.8	-267.3
	(1721.4)	(6722.2)		(1784.0)	(6941.2)	
Total Employees	328.5	526.7	-198.2	284.1	542.3	-258.2
	(1905.0)	(7251.6)		(1941.8)	(7487.7)	
Share Saudis	0.239	0.102	0.138***	0.220	0.0963	0.123***
	(0.160)	(0.106)		(0.130)	(0.0951)	
Share in Riyadh	0.366	0.433	-0.0666*	0.368	0.436	-0.0686*
	(0.482)	(0.496)		(0.482)	(0.497)	
Share in Makkah	0.326	0.333	-0.00660	0.326	0.319	0.00716
	(0.469)	(0.472)		(0.469)	(0.467)	
Share Eastern Region	0.0231	0.0431	-0.0199*	0.0230	0.0459	-0.0229*
	(0.150)	(0.203)		(0.150)	(0.210)	
Share Manufacturing	0.660	0.678	-0.0178	0.659	0.682	-0.0231
	(0.474)	(0.468)		(0.474)	(0.467)	
Share Trade	0.173	0.169	0.00347	0.173	0.168	0.00524
	(0.378)	(0.376)		(0.379)	(0.375)	
No. Obs			1455			1306

* We exclude firms with annual exports of less than 2750 SARS or more than 40 million SARS.
*** p<0.01, ** p<0.05, * p<0.1

Table 9: Nitaqat Bands and Exporting Firm Outcomes

Dependent Var:	Coefficient on Below Indicator Var:		
	(1)	(2)	(3)
A. Nitaqat Data			
Saudi Share	0.071***	0.066***	0.077***
	(0.007)	(0.007)	(0.007)
Δ Log Saudi Employment	0.400***	0.348***	0.424***
	(0.040)	(0.042)	(0.041)
Δ Log Foreign Employment	-0.233***	-0.238***	-0.237***
	(0.035)	(0.034)	(0.037)
Δ Log Total Employment	-0.139***	-0.151***	-0.136***
	(0.031)	(0.031)	(0.033)
Dummy Exit by 2012	0.009	0.005	0.011
	(0.007)	(0.006)	(0.007)
B. Customs Data			
No Exports in 2012 Dummy	0.069***	0.081***	0.059**
	(0.027)	(0.030)	(0.027)
Δ Log Total Exports Value	-0.290***	-0.229*	-0.287***
	(0.109)	(0.120)	(0.110)
Δ Log Export Value per Capita	-0.169	-0.086	-0.176
	(0.116)	(0.125)	(0.118)
Δ Log Total Exports Weight	-0.365***	-0.284**	-0.352***
	(0.107)	(0.116)	(0.110)
C. Gosi Data			
Δ Log Wage Bill	0.087***	0.079**	0.100***
	(0.033)	(0.032)	(0.034)
Δ Log Avg Saudi Wage	-0.051***	-0.053***	-0.054***
	(0.018)	(0.018)	(0.019)
Δ Log Saudi Employment Low-skilled	0.283***	0.284***	0.310***
	(0.038)	(0.038)	(0.040)
Δ Log Saudi Employment High-skilled	0.039	0.043	0.035
	(0.030)	(0.031)	(0.031)
Δ (Female Saudi/Total Saudi)	0.043***	0.041***	0.045***
	(0.013)	(0.013)	(0.014)
Fixed Effects Included	No	Yes	
Sample	All	All	Excludes extremes

Robust standard errors in parenthesis. Column (3) excludes observations with exports value in the bottom or top 5%. Each number comes from a different regressions. Fixed effects are economic activity fixed effects, region fixed effects and size fixed effects. All regressions are unweighted. Number of observations vary between 888 and 1455. *** p<0.01, ** p<0.05, * p<0.1

Table 10: Nitaqat Bands and Labor Market Outcomes

	(1)	(2)	(3)	Mean Dependent Var	No. Obs.
	Coefficient on Share Below Indicator Var:				
Dependent Var:					
Saudi Share	0.054***	0.041***	0.031***	0.13	446
	(0.014)	(0.012)	(0.008)		
Δ Log Saudi Employment	0.236**	0.527***	0.279***	0.26	429
	(0.099)	(0.158)	(0.087)		
Δ Log Foreign Employment	-0.336***	-0.033	-0.061	0.021	444
	(0.080)	(0.078)	(0.042)		
Δ Log Total Employment	-0.212***	0.018	-0.025	0.045	446
	(0.065)	(0.076)	(0.040)		
Dummy Exit by 2012	0.015	0.030*	0.007	0.016	447
	(0.021)	(0.015)	(0.006)		
Fixed Effects Included	No	No	Yes		
Weighted	No	Yes	Yes		

Robust Standard Errors in parenthesis. A labor market is defined at the region x industry level. Weights used are total number of employees in a labor market. All regressions include share of firms in labor market that are small, medium, large, and giant. Fixed effects include region and industry fixed effects. *** p<0.01, ** p<0.05, * p<0.1

Figure 1: Trends in Exports by Nitaqat Status

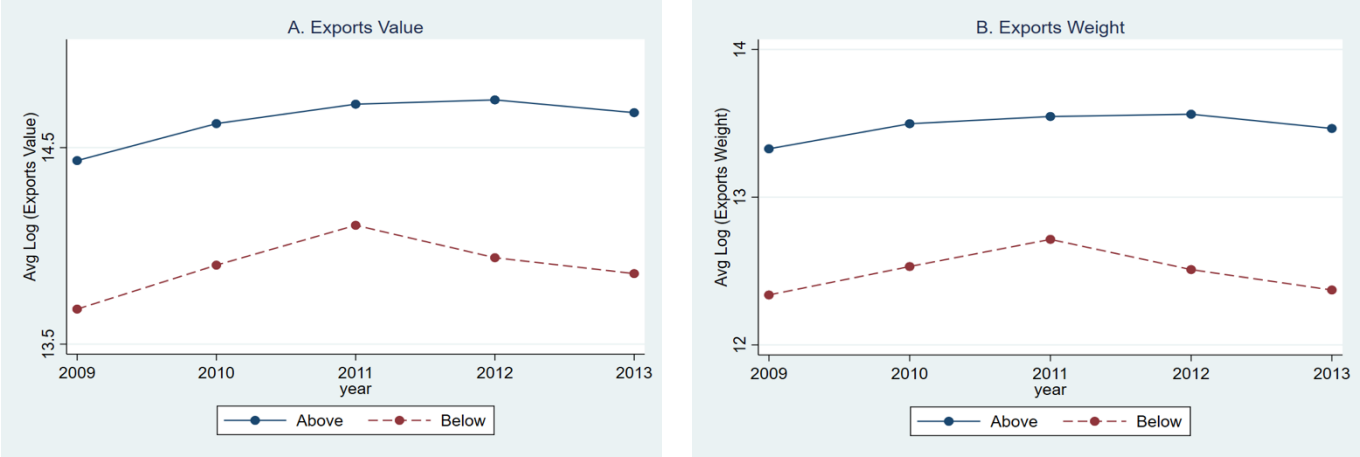


Figure 2: Event Study Analysis of Exports

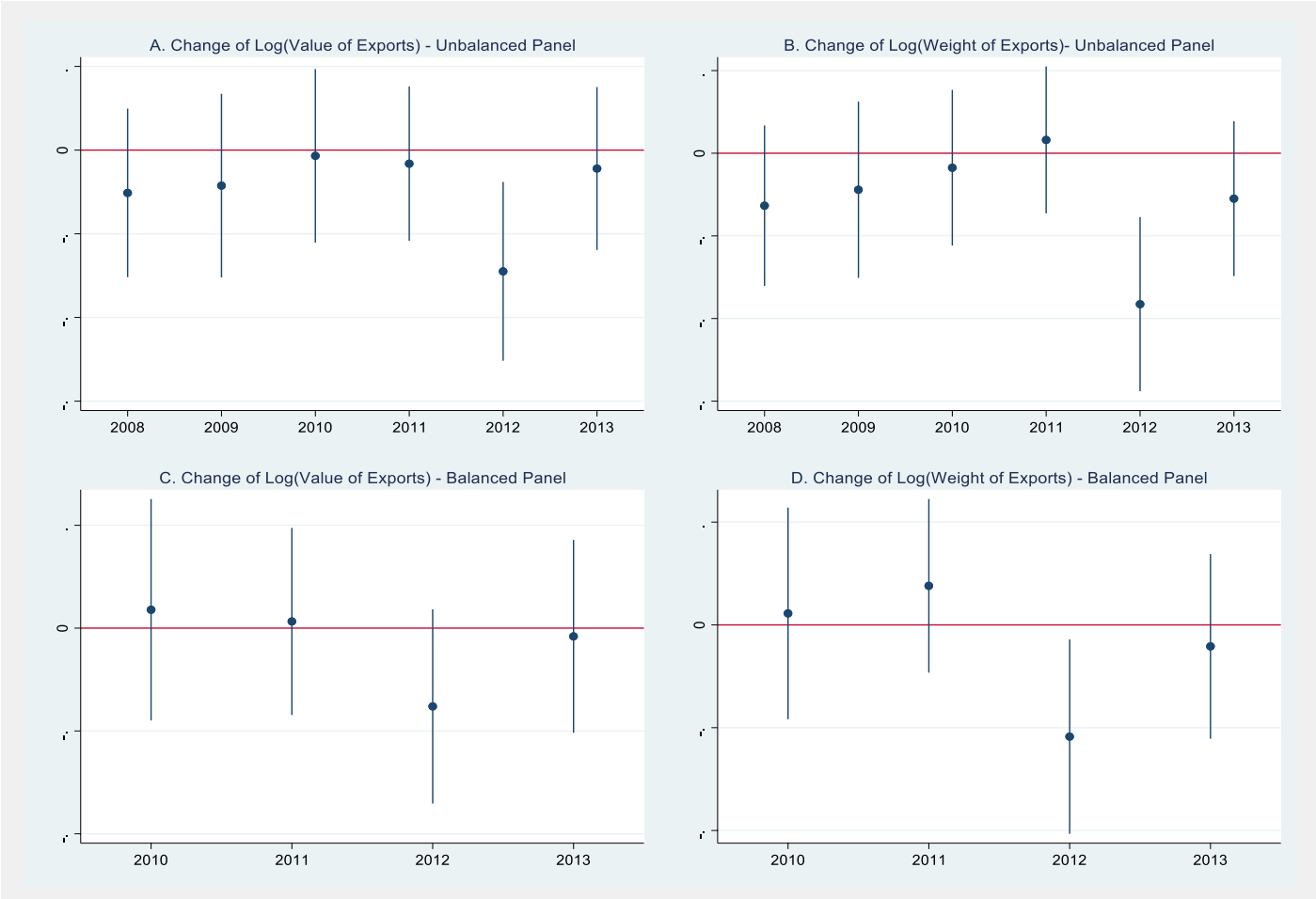
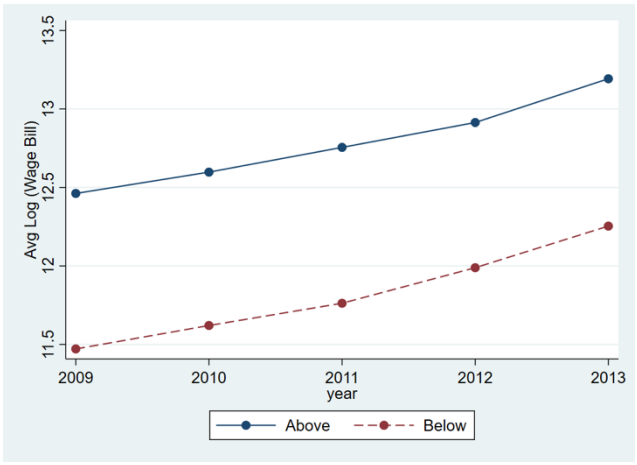


Figure 3: Wage Bill Analysis – Exporting Firms

A: Time Trends in Average Log (Wage bill)



B: Event Study. Outcome Change in Log (Wage Bill)