

**Can Hiring Quotas Work?  
The Effect of the Nitaqat Program on the Saudi Private  
Sector  
(Online Appendix)**

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APPENDIX A: ADDITIONAL TABLES AND FIGURES

Table A.1—: Number of Firms by Industry and Size Classification (July 2011)

Industry	Small (10-49)	Medium (50-499)	Large (500-2999)	Giant (3000+)	Total
Building and construction	34,179	5,351	578	39	40,147
Wholesale and retail trade	17,677	2,717	197	6	20,597
Multiple economic activities	16,050	.	.	.	16,050
Manufacturing	5,512	1,348	120	1	6,981
Workshops and maintenance services	6,481	194	4	.	6,679
Farmers, fishermen and shepherds	6,206	220	9	.	6,435
Restaurants and catering services	4,537	301	8	1	4,847
Personal services	2,364	170	10	1	2,545
Social and communal services	2,011	278	31	1	2,321
Passenger transportation (inter-city)	1,207	230	9	1	1,447
Maintenance and cleaning services	971	300	56	4	1,331
Health services	863	396	33	.	1,292
Lodging and tourism	1,085	185	19	.	1,289
Insurance and business services	493	135	9	.	637
Consulting services	400	145	6	.	551
Passenger transportation (intra-city)	351	140	10	.	501
Agriculture and livestock	343	61	12	2	418
Governmental and private schools	224	180	2	.	406
Foreign schools	171	109	1	.	281
Printing, publishing and media	238	33	2	.	273
Pharmacies	219	47	2	.	268
Collection offices and real estate	173	55	5	.	233
Institutes and colleges	144	73	5	.	222
Agriculture, fishing, grazing, horses	194	20	3	.	217
Electricity, gas and water	76	30	7	1	114
Gold and jewelry trade	76	16	.	.	92
Air transportation	69	20	3	.	92
Mining and quarrying	54	25	6	.	85
Petrochemicals, coal and rubber	50	29	6	.	85
Cement	44	28	11	.	83
Financial institutions (banks)	54	15	11	.	80
Private labor recruitment agencies	41	36	.	.	77
Petroleum and gas extraction	36	26	10	1	73
Shipping	45	14	.	.	59
General office services	29	2	.	.	31
Storage	19	2	1	.	22
Communications	7	4	1	.	12
<b>Total</b>	<b>102,693</b>	<b>12,935</b>	<b>1,187</b>	<b>58</b>	<b>116,873</b>

Notes: This table provides sample statistics on the number of firms in each of 37 industries and 4 size categories at baseline (July 9, 2011). Of the firms in the baseline sample, 1,027,017 were too small to be included in the Nitaqat program (fewer than ten employees). The fifteen industry classifications that were added in later versions of Nitaqat were road transport of goods within cities; road transport of goods between cities; laboratories; governmental and private schools (boys; mixed gender); security escorts; private employment offices; kindergarten; bakeries; ready-mixed concrete; information technology; governmental construction contractors; governmental hygiene contractors; petrol stations; and stone, granite and brick.

Table A.2—: Number of Employees by Industry and Type (July 2011)

Industry	Number of Firms	Total Workers	% Total Workforce	Saudi Workers	% Saudi Workforce	Industry Share Saudi
Building and construction	40,147	2,627,940	46.66	152,046	24.35	5.79
Wholesale and retail trade	20,597	927,861	16.47	127,711	20.45	13.76
Manufacturing	6,981	418,025	7.42	69,096	11.06	16.53
Multiple economic activities	16,050	199,166	3.54	4,795	0.77	2.41
Maintenance and cleaning services	1,331	167,817	2.98	12,791	2.05	7.62
Farmers, fishermen and shepherds	6,435	128,447	2.28	1,532	0.25	1.19
Restaurants and catering services	4,847	128,118	2.27	7,961	1.27	6.21
Health services	1,292	124,640	2.21	20,358	3.26	16.33
Social and communal services	2,321	123,849	2.20	39,229	6.28	31.67
Workshops and maintenance services	6,679	122,235	2.17	3,196	0.51	2.61
Personal services	2,545	82,198	1.46	11,923	1.91	14.51
Petroleum and gas extraction	73	70,720	1.26	53,699	8.60	75.93
Passenger transportation (inter-city)	1,447	65,567	1.16	4,929	0.79	7.52
Lodging and tourism	1,289	62,190	1.10	8,185	1.31	13.16
Agriculture and livestock	418	42,124	0.75	4,878	0.78	11.58
Consulting services	551	38,015	0.67	5,691	0.91	14.97
Passenger transportation (intra-city)	501	35,215	0.63	3,654	0.59	10.38
Insurance and business services	637	33,701	0.60	8,251	1.32	24.48
Governmental and private schools	406	30,045	0.53	11,390	1.82	37.91
Financial institutions	80	28,777	0.51	23,040	3.69	80.06
Electricity, gas and water	114	23,330	0.41	8,329	1.33	35.70
Cement	83	20,292	0.36	4,584	0.73	22.59
Institutes and colleges	222	20,292	0.36	8,607	1.38	42.42
Foreign schools	281	17,794	0.32	6,776	1.09	38.08
Collection offices and real estate	233	14,599	0.26	2,172	0.35	14.88
Mining and quarrying	85	12,111	0.22	4,808	0.77	39.70
Petrochemicals, coal and rubber	85	11,735	0.21	5,298	0.85	45.15
Pharmacies	268	11,316	0.20	1,907	0.31	16.85
Printing, publishing and media	273	10,922	0.19	2,127	0.34	19.47
Fishing, grazing and horses	217	9,731	0.17	835	0.13	8.58
Gold and jewelry trade	92	8,847	0.16	2,750	0.44	31.08
Private labor recruitment agencies	77	5,391	0.10	234	0.04	4.34
Air transportation	92	2,897	0.05	352	0.06	12.15
Shipping	59	2,376	0.04	518	0.08	21.80
Communications	12	1,661	0.03	198	0.03	11.92
Storage	22	1,602	0.03	428	0.07	26.72
General office services	31	644	0.01	188	0.03	29.19
<b>Total</b>	<b>116,873</b>	<b>5,632,190</b>		<b>624,466</b>		<b>11.09</b>
<b>Non-Nitaqat Firms</b>	<b>1,027,017</b>	<b>1,780,937</b>	<b>31.62</b>	<b>21,250</b>	<b>3.40</b>	<b>1.19</b>

Notes: This table provides sample statistics on the composition of the workforce by industry at baseline (July 9, 2011). Column 1 counts the number of firms in each industry category, and column 2 the number of employees at firms in those industries. Column 3 sorts industries by their share of the total private-sector workforce. Columns 4 and 5 report the number of Saudi workers in each industry and the share of workers in that industry in the total Saudi private sector workforce. Column 6 calculates the share of workers in each industry that are Saudi nationals, i.e. the overall industry Saudization rate. The last line reports the same statistics for the firms that were too small to be included in the Nitaqat program (less than ten employees).

Table A.3—: Number of Employees by Size and Type (July 2011)

Size Group	Number of Firms	Number of Workers	% Total Workforce	Saudi Workers	% Saudi Workforce	Share Saudi
Tiny (<10)	1,027,017	1,780,937	24.02	21,250	3.29	1.19
Small (10-49)	102,693	1,823,386	24.60	74,759	11.58	4.10
Medium (50-499)	12,935	1,582,555	21.35	190,263	29.47	12.02
Large (500-2999)	1,187	1,428,220	19.27	237,851	36.84	16.65
Giant (3000+)	58	798,029	10.77	121,593	18.83	15.24
Total	1,143,890	7,413,127		645,716		8.71

Notes: This table provides sample statistics on the composition of the workforce by size group at baseline (July 9, 2011). Column 1 counts the number of firms in each size category, and column 2 the number of employees at firms in those categories. Column 3 lists the category share of the total private-sector workforce. Columns 4 and 5 report the number of Saudi workers in each size group and the share of workers in that group in the total Saudi private sector workforce. Column 6 calculates the share of workers in each size category that are Saudi nationals, i.e. the overall category Saudization rate.

Table A.4—: RKD Results: Additional Robustness Checks

Outcome	Bandwidth Selector	Bandwidth (h,b)	Conventional		Bias-Corrected	
			Kink	p-value	Kink	p-value
<i>Panel 1: Local Linear</i>						
Saudi Employees	ROT	(50.36, 50.36)	0.27***	0.00	0.43***	0.00
	CCT	(10.00, 25.00)	0.39***	0.00	0.39***	0.00
	Manual	(5.00, 5.00)	0.35***	0.00	0.10	0.57
	Manual	(50.00, 50.00)	0.27***	0.00	0.43***	0.00
Expatriate Employees	ROT	(91.68, 91.68)	-0.14***	0.00	0.17***	0.00
	CCT	(27.00, 60.00)	0.11***	0.00	0.29***	0.00
	Manual	(5.00, 5.00)	0.60***	0.00	0.07	0.92
	Manual	(50.00, 50.00)	-0.02**	0.04	0.26***	0.00
Firm Size	ROT	(1.60, 1.60)	-14.47***	0.00	-71.56***	0.00
	CCT	(5.11, 11.25)	-2.60***	0.00	-2.02***	0.01
	Manual	(5.00, 5.00)	-2.33***	0.00	-11.16***	0.00
	Manual	(50.00, 50.00)	-1.59***	0.00	-2.47***	0.00
Exit Rate	ROT	(1.98, 1.98)	6.98***	0.00	52.18***	0.00
	CCT	(1.78, 7.04)	11.97***	0.00	13.99***	0.00
	Manual	(5.00, 5.00)	3.11***	0.00	6.42***	0.00
	Manual	(50.00, 50.00)	1.11***	0.00	1.38***	0.00
<i>Panel 2: Local Quadratic</i>						
Saudi Employees	ROT	(50.36, 50.36)	0.42***	0.00	0.35**	0.00
	CCT	(10.00, 25.00)	0.23**	0.02	0.24**	0.02
	Manual	(5.00, 5.00)	0.10	0.58	-1.10	0.14
	Manual	(50.00, 50.00)	0.43***	0.00	0.35***	0.00
Expatriate Employees	ROT	(91.68, 91.68)	0.17	0.00	0.32***	0.00
	CCT	(27.00, 60.00)	-0.01	0.92	-0.03	0.65
	Manual	(5.00, 5.00)	0.07	0.92	6.26**	0.03
	Manual	(50.00, 50.00)	0.26***	0.00	0.01	0.87
Firm Size	ROT	(1.60, 1.60)	-71.56***	0.00	179.90***	0.00
	CCT	(5.33, 10.49)	-10.48***	0.00	-12.27***	0.00
	Manual	(5.00, 5.00)	-11.16***	0.00	-1.84	0.73
	Manual	(50.00, 50.00)	-2.47***	0.00	-5.09***	0.00
Exit Rate	ROT	(1.98, 1.98)	52.18***	0.00	-7.36	0.54
	CCT	(3.05, 8.64)	20.03***	0.00	22.16***	0.00
	Manual	(5.00, 5.00)	6.42***	0.00	6.59**	0.04
	Manual	(50.00, 50.00)	1.38***	0.00	3.62***	0.00

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

*Note:* This table provides additional robustness checks for more choices of bandwidth than those reported in Tables 3 and 4. The sample includes the full set of firms present in the data in July 2011. The table reports the kink estimates and p-values for the ROT and CCT bandwidth selectors as well as bandwidths of 5 and 50. Results are reported for linear and quadratic specifications for both the convention and bias-corrected CCT estimator with robust standard errors. For Saudi employees the running variable is distance from the cutoff in terms of number of Saudis. For expatriate employees the running variable is distance from the cutoff in terms of number of expatriate workers. For firm size the running variable is Saudization percentage point distance from the cutoff. The number of employees in all categories is set to zero for firms that exit the market between July 2011 and October 2012. Bandwidth is based on the units of the running variable. The largest and smallest 1% outliers in outcome variables are Winsorized for the Saudi and expatriate regressions and the largest 1% increases for the firm size regressions.

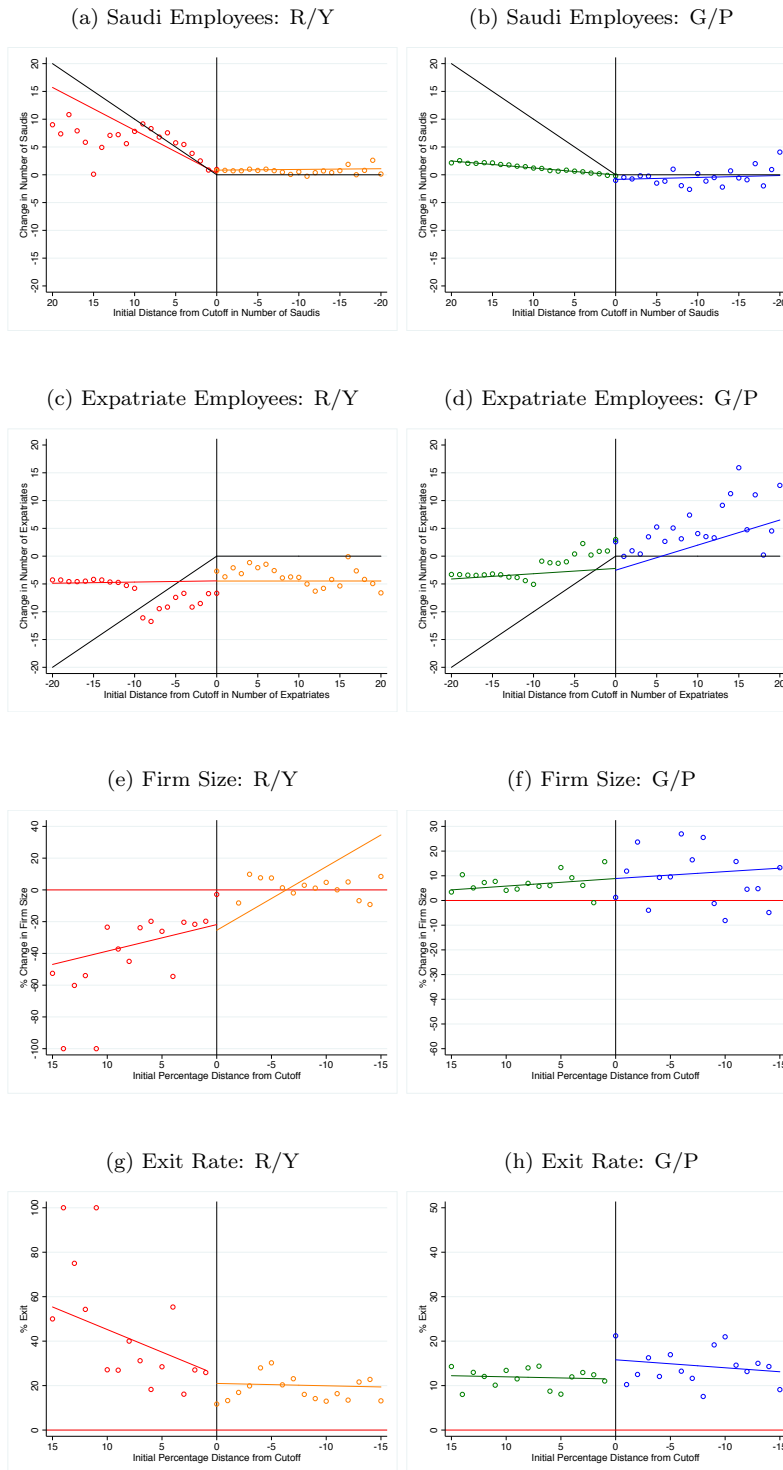


Figure A.1. : RKD Figures: Red/Yellow and Green/Platinum Cutoffs

*Note:* These figures show the graphical RKD results for the full sample of baseline firms at the Red/Yellow and Green/Platinum cutoffs. Circles plot the average outcome variable for firms in one-unit bins based on initial distance from the cutoff. Black lines for Saudi and expatriate employees show full-compliance benchmarks. Firms that exit over the period are coded as losing all of their Saudi and expatriate employees, for a 100 percent reduction in size.

## APPENDIX B: SECTOR AND INDUSTRY-LEVEL RESULTS

The impact of the program varies by industry, and Figure B.1 presents the main RKD results by sector. The strongest effects, both in terms of compliance (hiring Saudis) and costs (exit and downsizing), were experienced by the secondary sector, which includes construction (the largest private-sector industry) and manufacturing. Effects were more muted in the services sector, with lower compliance rates as well as more muted kinks in the size and exit relationships. The primary sector (agriculture and extraction) shows little effect of the program – there is no evidence of an increase in the number of Saudis employed at Yellow and Red firms, and no corresponding decrease in firm size or increase in exit. This pattern is likely the result of several factors, including the degree to which different industries rely on foreign labor as well as the degree of competitiveness in the included industries. The services sector is the least exposed to competition from imports, and while these firms did increase Saudi hiring as a result of the program the exit and downsizing effects were lower than in the secondary sector. In construction in particular, Saudization rates are among the lowest, and the industry has historically relied heavily on low-cost foreign labor. It was critical that these firms improve their color band status in order to keep the bulk of their workforce, so compliance rates were very high. The costs were also very acutely felt, however, with a strong response to the program in terms of firm size and exit rates. In the retail sector, which is less reliant on expatriate labor, compliance rates were slightly lower and costs were more muted.

Figure B.1 : RKD Results on Industry Subsamples

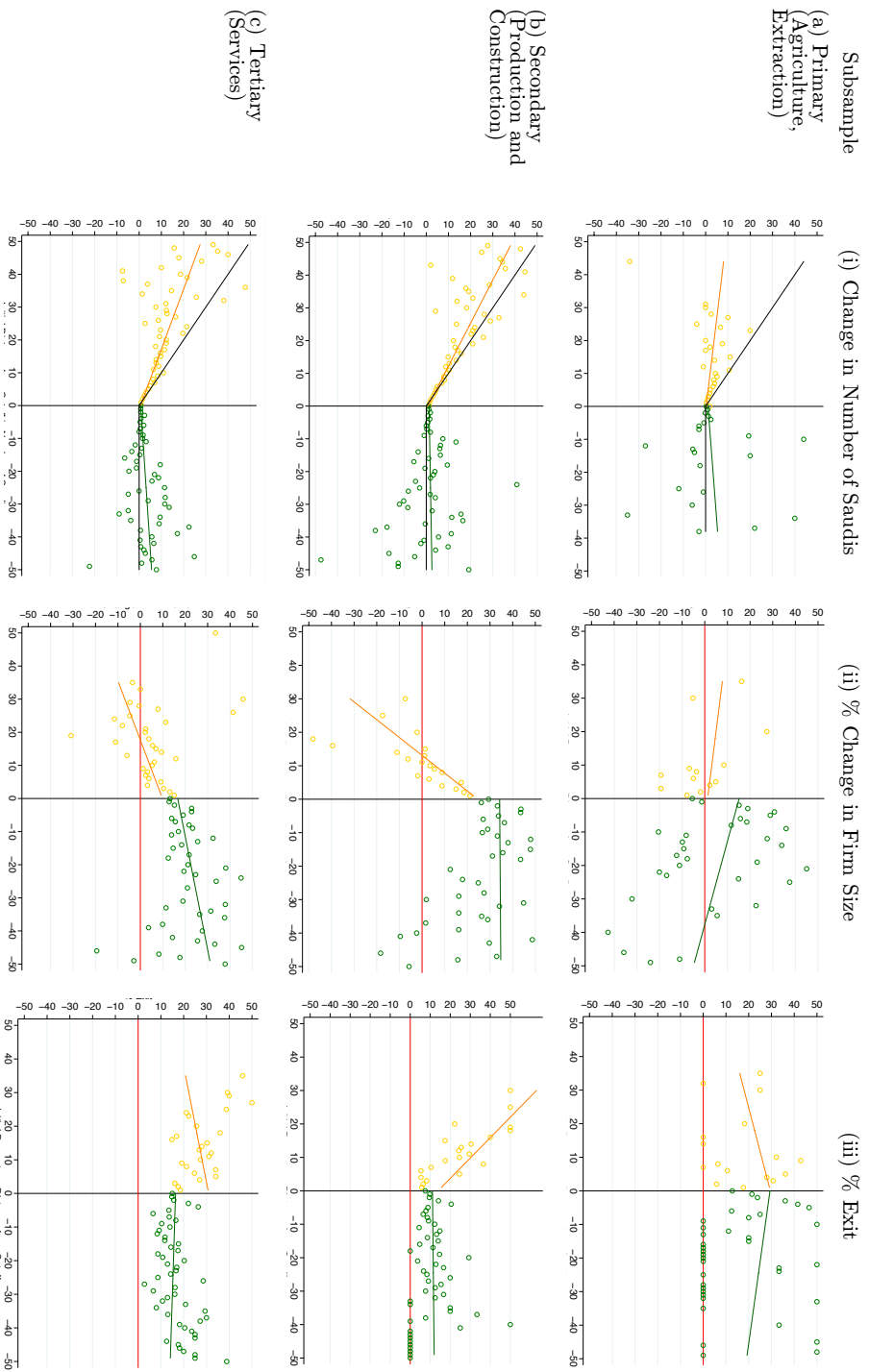
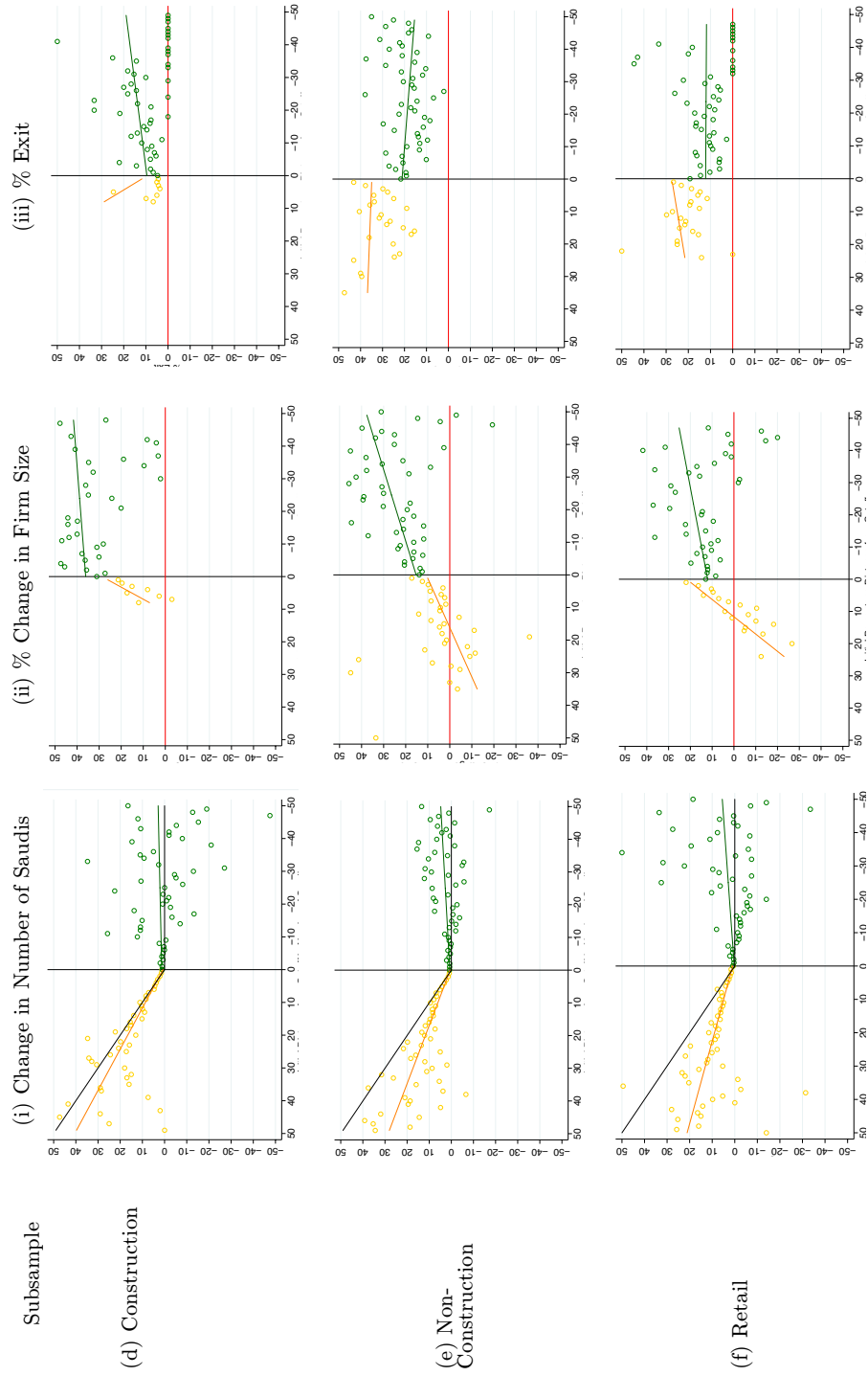




Figure B.1 : RKD Results on Industry Subsamples



## APPENDIX C: RESULTS ON STOCK MARKET DATA

Because Nitaqat affected firm exit rates, it likely also had effects on the capital investments, profitability, and market value of surviving firms. Unfortunately, these types of indicators are only available for the firms listed on the Saudi Stock Exchange. This appendix presents the data and RKD figure for the change in market value of these firms. The sample is too small to draw any conclusions about the size of these effects, however, so they are excluded from the main results.

Stock price and balance sheet data are available for all Nitaqat entities belonging to joint stock companies that are listed on the Saudi Stock Exchange. These companies are required to submit their balance sheets and auditors' reports to the Ministry of Commerce and Industry on a quarterly basis. This data, along with the number of shares and stock price, are available through the Saudi Stock Exchange (Tadawul) on their website (<http://www.tadawul.com.sa>) as well as through Bloomberg. Of the 158 firms listed during the period, 147 were matched to Nitaqat entities, and 255 entities were matched to listed firms. Of these, 156 had stock price information available for the period. When multiple entities were matched to a single firm, most were subsidiaries of a larger firm that were engaged in different economic activities or that were located in different geographic areas. Balance sheet items that were reliably reported included capital, total equity, liabilities, expenses, and inventories. Compared to the rest of the sample, these firms tend to be large and to have higher Saudization rates. Only 22 percent of these firms were in the Small size category; 39 percent fell in the Medium, 36 percent in the Large, and 3 percent in the Giant category. They also tend to be concentrated in different industries, with the largest groups of Tadawul firms in manufacturing (19 percent), insurance (17 percent), and retail (15 percent). Construction is notably not well-represented, with only 8 percent of these firms in that sector compared with 35 percent of all Nitaqat firms. Although they are certainly not a representative sample, there is still some variation in their color bands at baseline, with 18 percent beginning in the Red band, 10 percent in the Yellow band, 32 percent in the Green band and 40 percent in the Platinum band.

The RKD figure for the market value of the 147 publicly-listed firms is shown in Figure C.1. Unfortunately the small sample size makes it impossible either to detect a kink in market value or to find a sufficiently precise zero. As suggested by the figure, parametric estimates of the kink are very noisy and usually not statistically significant. This is also the case for other balance sheet measures available in the Tadawul data for these firms.

Figure C.1 : Market Value

