

Worker Mobility in a Global Labor Market: Evidence from the UAE

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Monopsony and Migration

- Increasing immigration from poor to rich countries potentially large welfare gains.
- Many countries have policies that reduce competition in labor markets by restricting labor mobility across geographic space or across firms.
- Visas that tie foreign workers to a specific employer are very common.
 - e.g. H-class visas in the U.S.
- Ruhs (2014): negative cross-country correlation between migrant rights and level of migration.
- May also affect people who would like to migrate: 40% of adults in poorest quartile of countries would like to migrate permanently (Gallup 2011)

The *Kafala* system.

- Gulf countries with highest migrant share (over 15 million migrant workers) restrict migrant political and economic rights most.
- Migrant workers tied to one employer for duration of visa (3 years in the UAE in 2010).
- No-objection certificates in Gulf countries
- Written permission required from initial employer to switch to another employer (enforced through visas)
- Without written permission to switch, workers can continue to work for their initial employers or leave the country
- In the UAE, workers had to leave the country for at least 6 months
- Abuses anecdotally rampant. Reformers calling for an end to these restrictive labor market systems.

Question

- Broader Question: What is the effect of increasing labor market competition?
 - On affected workers.
 - On potential migrants.
- Policy Question: What is the effect of allowing migrant workers to switch employers upon visa expiration?

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- Policy Question: What is the effect of allowing migrant workers to switch employers upon visa expiration?
- Simple model of monopsony to explain results:
 - Increased labor market competition leads to higher wages for incumbent migrants.
 - However, also suggests *increased* use of incumbent migrants and *decreased* use of new recruits.
 - Resulting estimates can be used to calculate extent of market power of recruiting companies.
 - Elasticity of labor supply facing firm roughly 1, increasing to 1.2-1.5 following reform.

Overview of Approach

Exploit policy variation in the UAE

- Reform in 2011 no longer requiring written permission from initial employer to change employers at the end of labor contracts.
- Already signed contracts still had to be fulfilled.

Empirical Strategy

- comparing before and after the reform
- individual-level variation in expiration dates of labor contracts

Combine 2 Administrative Data Sets

- payroll data on migrant workers' earnings every month
- government data base that registers the contract terms on every job

Context: UAE

- 89% of population (96% of private workforce) are migrants.
- Pre-reform labor market system for migrants
 - Workers tied to particular employer for duration of visa/contract (3 years prior to 2011, 2 years since).
 - If workers quit before their contracts expire, they must leave country at their own expense.
 - Needed written permission (No-Objection Certificate) from employer to take a job at another employer following contract expiration.
 - Otherwise have to renew with old employer or return to source country for at least 6 months.

At the beginning, when I gave my one-month notice to move to another job, my boss said OK, but at the end of the month he said no, he needs me, it is not his problem I didn't want to continue in that job

- Worker interviewed by the National

- Announced in December 2010 and going into effect January 2011
 - No NOC required to switch employers **following a contract**.
 - No changes to requirements during a contract.
- Other components of reform:
 - duration of contracts changed from 3 to 2 years
 - upper limit of age of workers from 65 to 60
 - changes to visa fees for highly educated workers
- Contracts signed under previous system still had to be fulfilled → individual variation in expiration date of existing contract.

Responses to the Announcement of the Reform

Giving the private sector more freedom of movement will have automatic impact on employers by the way of preserving their interests through creating many options for recruiting skillful workers as per the supply-demand equation... These measures [are] expected to play a major role in advancing efforts towards creating an efficient labour market and sharpening competitiveness and transformation towards a knowledge-driven economy

- Labour Minister Saqr Ghobash

We used to have control over them [migrant workers], and we knew it wasn't easy from them to go, now we will lose this control.

- Administrator for a company interviewed by the National

Related literature

- Labor literature on monopsony power and worker outcomes
 - Survey of research in Manning (2011)
 - Estimate elasticity of labor supply to firm in response to changes in (1) wage or (2) employment levels
 - We exploit exogenous variation in labor market competition
- Other non-competitive labor market contracts and institutions.
 - Non-compete clauses (Marx 2011)
 - Historical migrant indentures (Galenson 1981, Abramitzky and Braggion 2006)
 - Bonded labor related to agriculture/tenancy (Bardhan 1984, von Lilienfeld-Toal and Mookherjee 2010).
 - British Master and Servant law (Naidu and Yuchtman 2013, Naidu 2010)
- How policies and economic conditions in host countries affect migrant outcomes
 - Clemens (2013), McKenzie, Theoharides and Yang (2013)

Roadmap

- Theoretical Predictions: Monopsony
- Data
- Individual-level results: Reform led to changes in worker outcomes following their contract expirations
 - Monthly earnings increase by 10%, employer transitions double, country exits fall
 - Robustness
- Firm-level results: Reform led to changes in firm hiring behavior
 - Firms hire fewer new entrants
 - Unlike workers already in the UAE, new entrants' earnings do not increase
- Market Power Calculations

Conclusion

- Results highlight the trade-offs associated with increasing labor market competition for immigrants within a country
- Workers already in the country benefit (increased earnings, increased labor mobility, lower country exits)
 - Reduction in exits suggests that the increased earnings do not just reflect a compensating differential for unobserved job quality
- However, welfare losses for individuals in developing countries who would have been able to find jobs under the restrictive system that no longer can migrate to the UAE.
- Larger normative implications for design of migration policy.
 - Distributional effects of migration.
 - Larger population of longer-term migrants.

Theoretical Predictions

- Simple model of monopsony with two types of workers: already in country L_c and new recruits L_r .
- Ignore dynamics in simple version.

$$\Pi(w_c, L_r | L_c) = F((1 - q(w_c))L_c, L_r) - w_c(1 - q(w_c))L_c - (w_r(L_r) + v_r)L_r \quad (1)$$

If we denote by $\eta_i \equiv \frac{\epsilon_i(w_i)}{1 + \epsilon_i(w_i)}$, where ϵ_i is the labor-supply elasticity for labor type $i \in r, c$, we have the following first-order condition

$$F_{L_c}((1 - q(w_c))L_c, L_r) = \frac{w_c}{\eta_c} \quad (2)$$

$$F_{L_r}((1 - q(w_c))L_c, L_r) = \left(\frac{w_r}{\eta_r} + v_r \right) \quad (3)$$

- v_r : Visa and recruitment costs for new recruits.

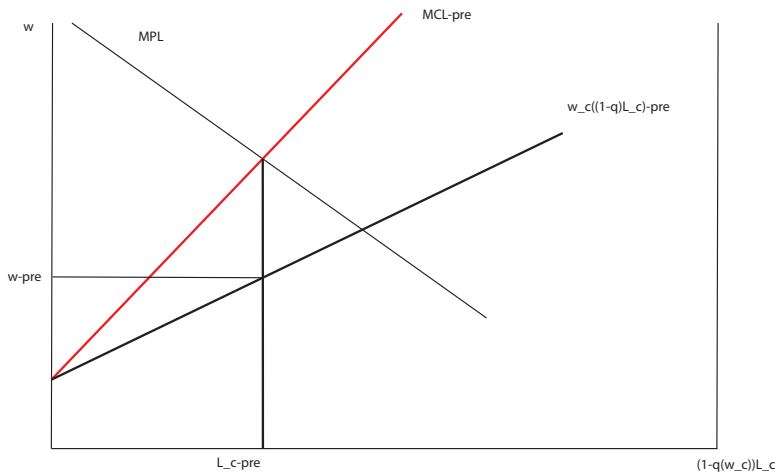
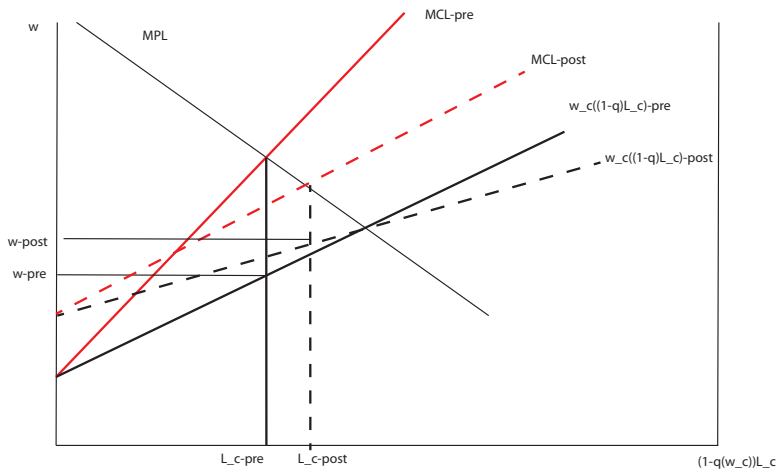


Figure: Standard Monopsony Labor Market

Theoretical Predictions

- Shift from monopsony $\eta_c < 1$ to more competitive labor market (with higher η_c , possibly 1) for existing pool of workers [▶ Figure](#)
 - Their wages increase: (w_c increases.)
 - Quantities $q(w_c)$ increase (i.e. their probability of leaving the country falls)
- If no change in the monopsony power over new recruits η_r .
- L_r, L_c substitutes implies the wages and number of new entrants falls.
- But η_r may change if new recruits sufficiently forward looking.



Match two administrative data sets using a unique government identifier

1. Administrative payroll data from a private payroll processing firm
 - Monthly payroll disbursement from January 2009 - October 2012
 - Firm implements payments for 10-15% of UAE migrant workforce.
 - Used by thousands of firms of all sizes to adhere to law requiring electronic records of wage payments
 - 80% of payroll observations match into the Ministry of Labor data

2. Ministry of Labor (MOL) administrative data on terms of contracts between workers and firms
- Includes all migrants in the UAE under the jurisdiction of the MOL (excludes domestic workers and free zone workers) - 80% of total migrant population
 - Key information: start and end dates of contracts
 - Terms of contract: contract earnings and contract hours (differs from actual earnings and hours)
 - Allows to identify whether a person leaving the payroll data is joining another firm or exiting the country
 - Allow 3-month window between transitions
 - Allows us to link the same individuals across contracts in the payroll data

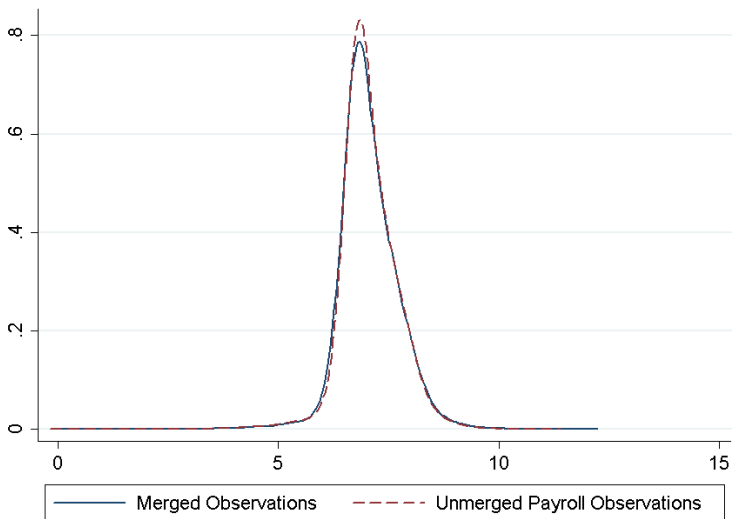


Figure: Density of Matched Payroll-MOL and Unmatched Payroll Log Earnings

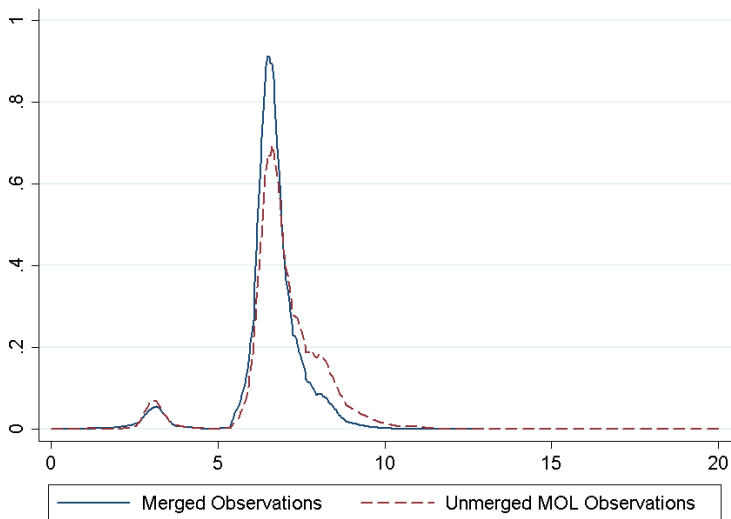
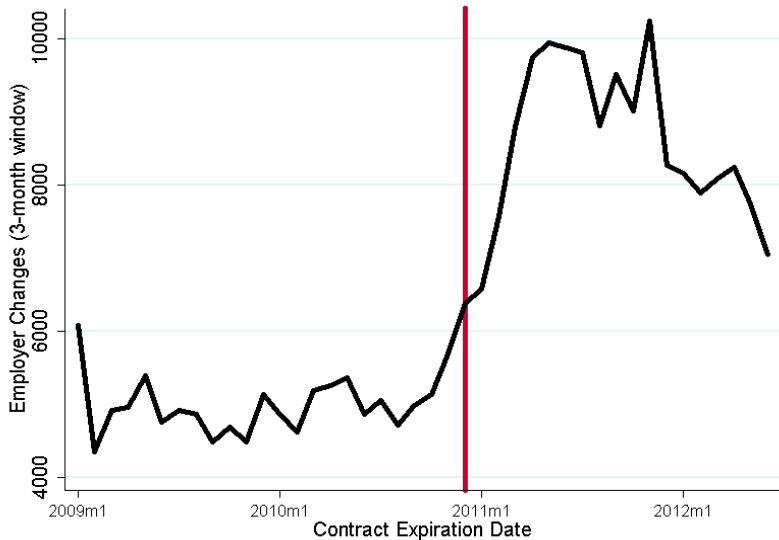
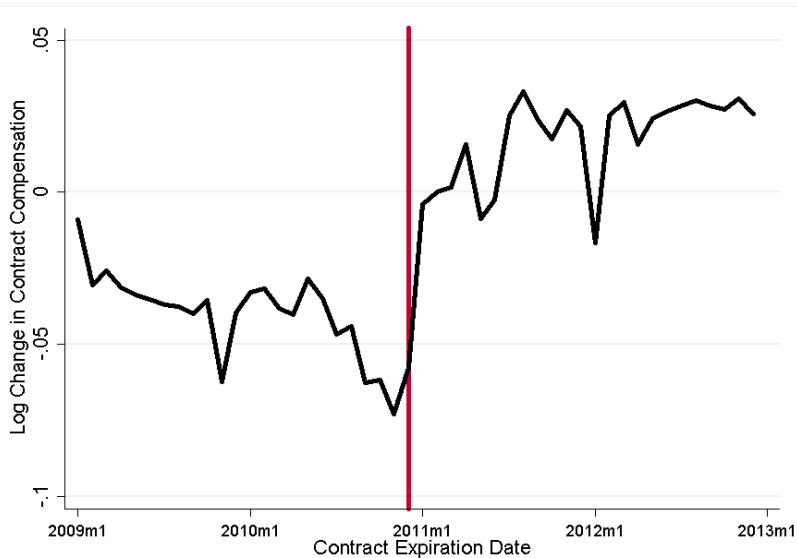


Figure: Density of Matched Payroll-MOL and Unmatched MOL Log Contract Salary

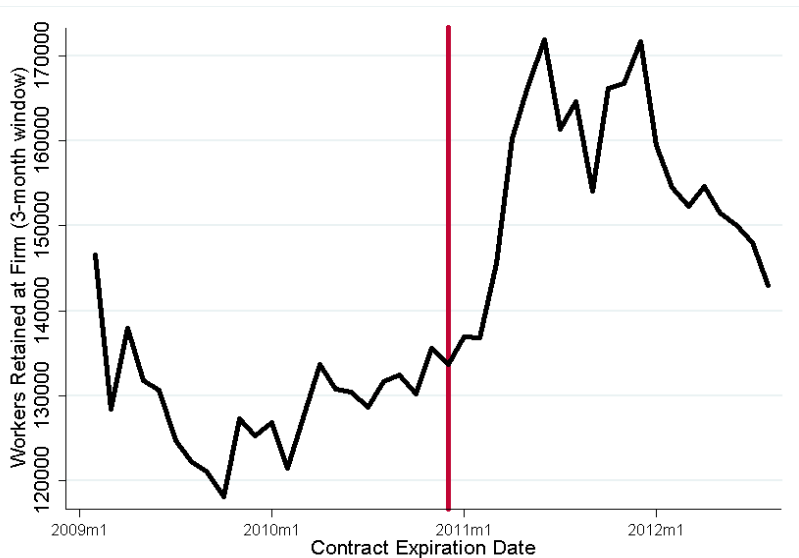
Aggregate Trends in Employer Transitions



Log Change in Real Compensation At Contract Expiration



Total Workers Retained by Firm At Contract Expiration



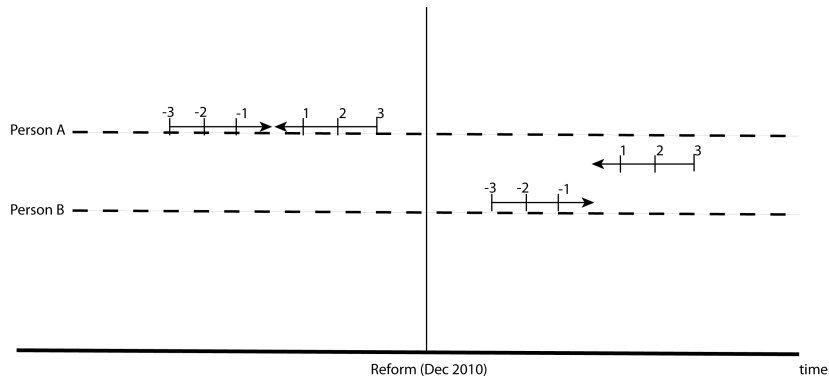
Summary Statistics

	Pre-Reform		
	Mean	Std. Dev.	N
Log Monthly Earnings	7.013	0.560	183543
Stay with Firm (x100)	94.60	22.60	179656
Exit UAE (x100)	4.852	21.49	192906
Employer Change (x100)	0.194	4.400	177858
Stayer	0.973	0.161	193972
Construction	0.705	0.456	144524
Age	36.68	8.304	193972
Male	0.998	0.0389	193972
Educated	0.276	0.447	181559
Dubai-Sharjah	0.652	0.476	193960
Indian	0.507	0.500	190617
Hours (Lowerbound)	254.3	50.66	100246
Hours (Upperbound)	264.3	60.67	100246

Identification Strategy: Differences-in-Differences

- Before and after an individual worker's contract expires
- Key: Contracts are signed 3 years in advance, and have fixed duration.
 - Timing of individual contract expiration is exogenous to the reform and to transitory worker and firm shocks.
- Before and after the implementation of the reform (January 2011)
- Control for individual and period fixed effects.
- Look at wages, firm stays, country exits and transitions around a contract expiration.

Visual Representation of Identification Strategy

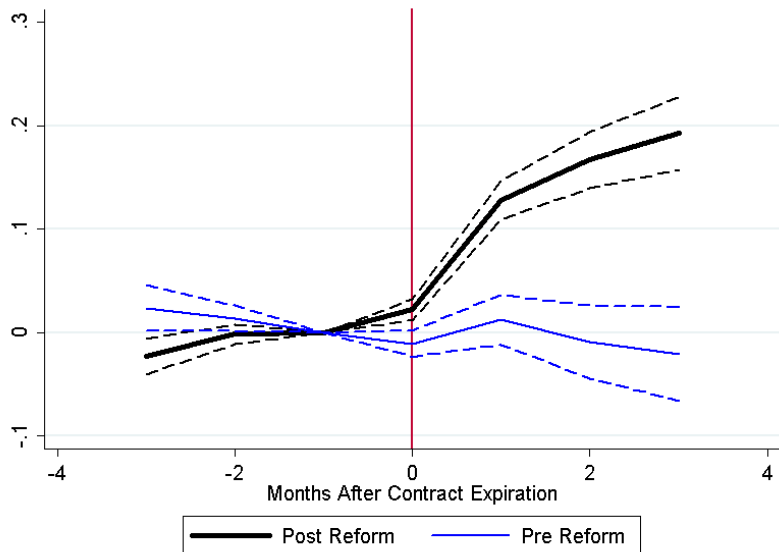


Regression Specification

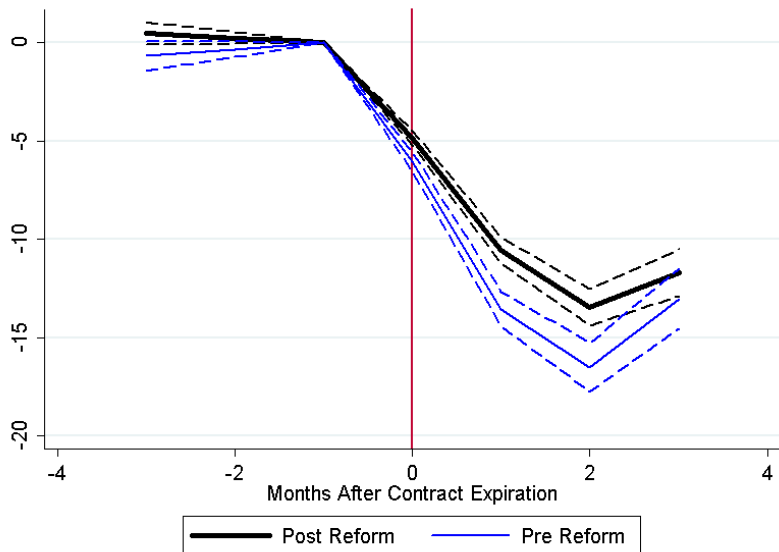
$$y_{it} = \sum_{k=-3}^3 \gamma_k^{Post2011} D_{it+k} + \sum_{k=-3}^3 \gamma_k^{Pre2011} D_{it+k} + \delta_i + \delta_t + \epsilon_{it} \quad (4)$$

- D_{it+k} = indicator for period relative to the contract expiration
- k is the period before/after the contract expires
- restrict sample to observations within 3 periods of a contract expiration
- $k < 0$ leads allow us to examine pre-expiration trends.
- Omitted category $k = -1$.

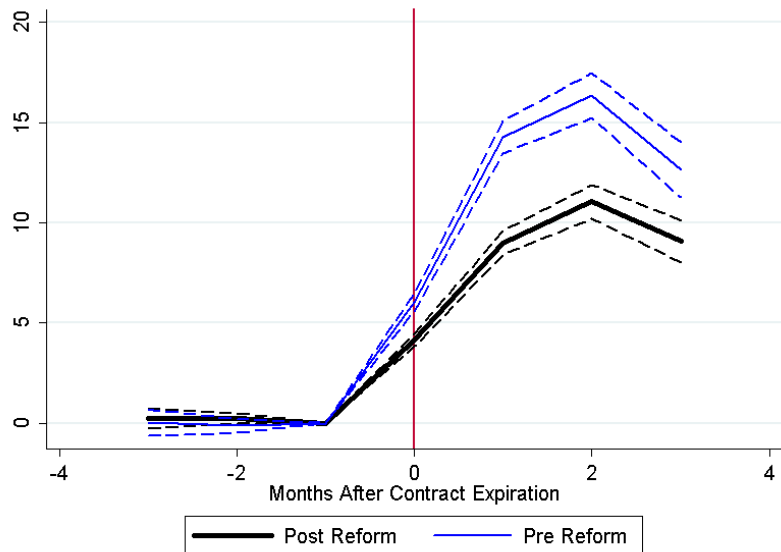
Results on Earnings



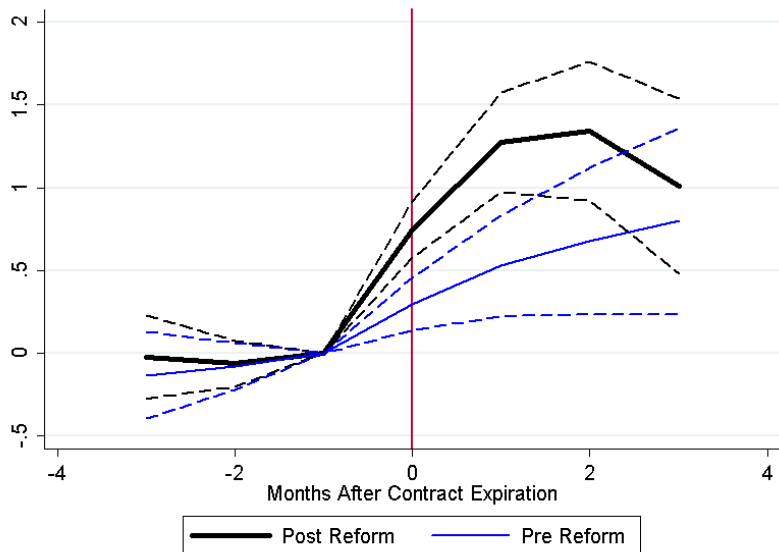
Results on Staying with Firm



Results On Country Exits



Results on Employer Transitions



Robustness

- Controls
 - Quartic polynomials in time between contract issue date and the reform, separately before and after the reform.
 - Quarter-specific worker characteristics (education, Indian, age, construction).
 - Lags of earnings interacted with post 2011.
 - All of the above.
- Sub-samples
 - Workers with earnings observed before the reform.
 - Exclude first and last calendar quarters of the sample and within 1 quarter of the reform.

▶ Tables

Regression Results on Log Earnings

Table: Effect on Log Earnings

	Full Sample				Both Sides	Trimmed
	(1)	(2)	(3)	(4)	(5)	(6)
(Post-Pre Reform) X Post Expire	0.113*** (0.009)	0.110*** (0.009)	0.109*** (0.011)	0.057*** (0.010)	0.091*** (0.010)	0.139*** (0.012)
(Post-Pre Reform) X Contract Expire	0.015*** (0.005)	0.013** (0.005)	0.016** (0.006)	0.031*** (0.006)	0.049*** (0.005)	0.017*** (0.006)
Polynomials in Time to Reform	No	Yes	Yes	Yes	No	No
Worker Characteristics	No	No	Yes	Yes	No	No
Lagged Earnings	No	No	No	Yes	No	No
N	529502	529502	342555	342555	463312	447394
Number of Clusters	111006	111006	69239	69239	88290	105606
R-squared	0.017	0.017	0.023	0.087	0.010	0.019

All specifications include individual, year-month fixed effects and a constant term. Standard errors clustered by individual in parentheses. ***, **, * denotes significance at the 1, 5, and 10% levels, respectively. The full sample includes all months from January 2009 to October 2012. The both sides sub-sample restricts attention to workers with wage observations both before and after the reform. The trimmed sub-sample excludes the last quarters of 2010 and 2012 and the first quarter of 2009 and 2011.

Regression Results on Staying with Firm

Table: Effect on Staying with Firm

	Full Sample				Both Sides	Trimmed
	(1)	(2)	(3)	(4)	(5)	(6)
(Post-Pre Reform) X Post Expire	3.832*** (0.304)	4.333*** (0.321)	6.387*** (0.405)	5.962*** (0.353)	3.106*** (0.282)	4.270*** (0.393)
(Post-Pre Reform) X Contract Expire	1.642*** (0.205)	1.881*** (0.224)	2.743*** (0.242)	2.585*** (0.214)	0.223** (0.114)	1.759*** (0.266)
Polynomials in Time to Reform	No	Yes	Yes	Yes	No	No
Worker Characteristics	No	No	Yes	Yes	No	No
Lagged Earnings	No	No	No	Yes	No	No
N	525737	525737	343503	343503	466806	445200
Number of Clusters	110120	110120	68931	68931	88293	105448
R-squared	0.082	0.082	0.370	0.372	0.093	0.081

All specifications include individual, year-month fixed effects and a constant term. Standard errors clustered by individual in parentheses. The full sample includes all months from January 2009 to October 2012. The both sides sub-sample restricts attention to workers with wage observations both before and after the reform. The trimmed sub-sample excludes the last quarters of 2010 and 2012 and the first quarter of 2009 and 2011.

Regression Results on Exits From UAE

Table: Effect on Exits from UAE

	Full Sample				Both Sides	Trimmed
	(1)	(2)	(3)	(4)	(5)	(6)
(Post-Pre Reform) X Post Expire	-4.408*** (0.271)	-4.749*** (0.287)	-6.608*** (0.370)	-6.356*** (0.329)	-3.570*** (0.255)	-4.756*** (0.355)
(Post-Pre Reform) X Contract Expire	-1.822*** (0.184)	-1.983*** (0.200)	-3.094*** (0.227)	-2.972*** (0.201)	-0.201** (0.089)	-2.065*** (0.239)
Polynomials in Time to Reform	No	Yes	Yes	Yes	No	No
Worker Characteristics	No	No	Yes	Yes	No	No
Lagged Earnings	No	No	No	Yes	No	No
N	550933	550933	356203	356203	477737	465333
Number of Clusters	111319	111319	69442	69442	88290	106789
R-squared	0.084	0.084	0.347	0.348	0.092	0.083

All specifications include individual, year-month fixed effects and a constant term. Standard errors clustered by individual in parentheses. The full sample includes all months from January 2009 to October 2012. The both sides sub-sample restricts attention to workers with wage observations both before and after the reform. The trimmed sub-sample excludes the last quarters of 2010 and 2012 and the first quarter of 2009 and 2011.

Regression Results on Employer Transitions

Table: Effect on Employer Change

	Full Sample				Both Sides	Trimmed
	(1)	(2)	(3)	(4)	(5)	(6)
(Post-Pre Reform) X Post Expire	0.663*** (0.102)	0.639*** (0.109)	0.255** (0.117)	0.269*** (0.102)	0.327*** (0.097)	0.633*** (0.129)
(Post-Pre Reform) X Contract Expire	0.491*** (0.070)	0.478*** (0.078)	0.311*** (0.076)	0.301*** (0.067)	-0.311*** (0.047)	0.546*** (0.088)
Polynomials in Time to Reform	No	Yes	Yes	Yes	No	No
Worker Characteristics	No	No	Yes	Yes	No	No
Lagged Earnings	No	No	No	Yes	No	No
N	514606	514606	335281	335281	459035	434276
Number of Clusters	109388	109388	68495	68495	88293	104121
R-squared	0.006	0.006	0.153	0.156	0.008	0.006

All specifications include individual, year-month fixed effects and a constant term. Standard errors clustered by individual in parentheses. The full sample includes all months from January 2009 to October 2012. The both sides sub-sample restricts attention to workers with wage observations both before and after the reform. The trimmed sub-sample excludes the last quarters of 2010 and 2012 and the first quarter of 2009 and 2011.

Effects on Hours

Table: Effect on Hours Variables

	Hours Upper Estimate		Hours Lower Estimate	
	(1)	(2)	(3)	(4)
(Post-Pre Reform) X Post Expire	-1.487 (1.194)	-0.094 (1.680)	-1.239 (0.995)	-0.078 (1.400)
(Post-Pre Reform) X Contract Expire	-0.388 (0.649)	-0.820 (0.911)	-0.324 (0.541)	-0.683 (0.759)
Polynomials in Time to Reform	No	Yes	No	Yes
Worker Characteristics	No	Yes	No	Yes
N	302471	186812	302471	186812
Number of Clusters	72897	44295	72897	44295
R-squared	0.005	0.013	0.005	0.013

All specifications include individual, year-month fixed effects and a constant term. Standard errors clustered by individual in parentheses.

Bounding Selection Effects

- One issue is that selective exits may bias the results on earnings and transitions.
- We construct bounds on the bias due to selection.
- “Naive” bounds: impute 90th and 10th percentile of earnings distribution to exits.
- Also do coarser “DID” bounds
 - Take residuals of each outcome conditional on worker and year-month fixed effects \tilde{y} for 7 periods around a contract expiration.
 - Lower bound on effect calculated as:

	Pre-Reform	Post-Reform
Pre-Expiration	\tilde{y}_{10}	\tilde{y}_{90}
Post-Expiration	\tilde{y}_{90}	\tilde{y}_{10}

- Symmetric exercise for upper bounds.
- Maximizes the impact of selection on the coefficients estimated in our DID framework

Regression Results on Imputed Outcomes

Table: Effect on Imputed Outcome Variables

	Earnings Imputed		Emp Change Imp.	
	High (1)	Low (2)	High (3)	Low (4)
(Post-Pre Reform) X Post Expire	0.185*** (0.009)	0.031*** (0.009)	0.644*** (0.098)	0.558*** (0.098)
(Post-Pre Reform) X Contract Expire	0.046*** (0.005)	-0.019*** (0.005)	0.480*** (0.067)	0.445*** (0.067)
N	550920	550920	536024	536024
Number of Clusters	111319	111319	110337	110337
R-squared	0.016	0.012	0.005	0.005

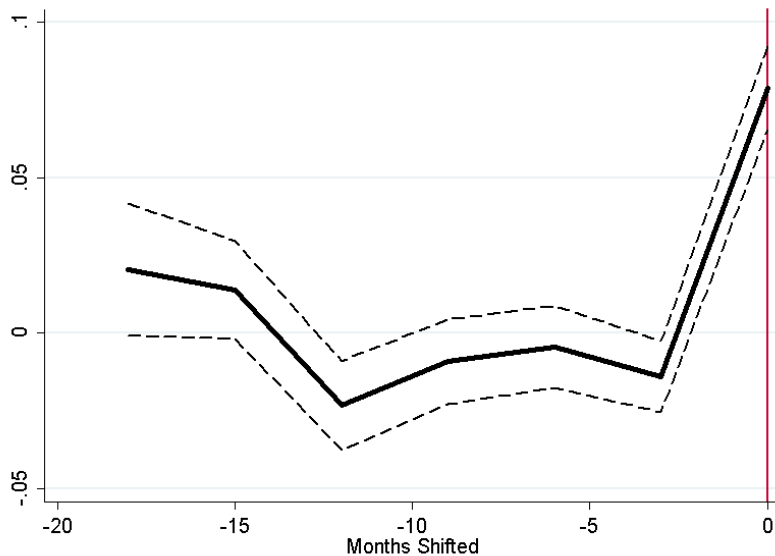
All specifications include individual, year-month fixed effects and a constant term. Standard errors clustered by individual in parentheses.

Time-shifted Placebos

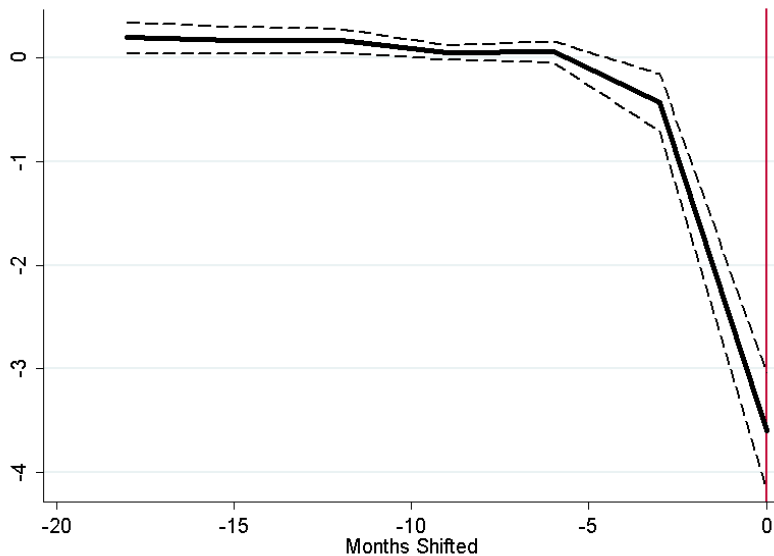
- Falsification exercise: shifting contract expiration back from 3 to 18 months (in intervals of 3)
- i.e. re-estimate specification replacing D_{it} with $D_{it}^j = \tilde{D}_{it-j}$ for $j = 0, 3, 6 \dots 18$
- Plot resulting $\sum_{k=1}^3 \frac{\tilde{\gamma}_{i,t+k}^{Post2011,j} - \tilde{\gamma}_{i,t+k}^{Pre2011,j}}{3}$ for each j where γ 's are the coefficients in the specification:

$$y_{it} = \sum_{k=0}^3 \gamma_k^{Post2011} D_{it+k} + \sum_{k=0}^3 \gamma_k^{Pre2011} D_{it+k} + \delta_i + \delta_t + \epsilon_{it} \quad (5)$$

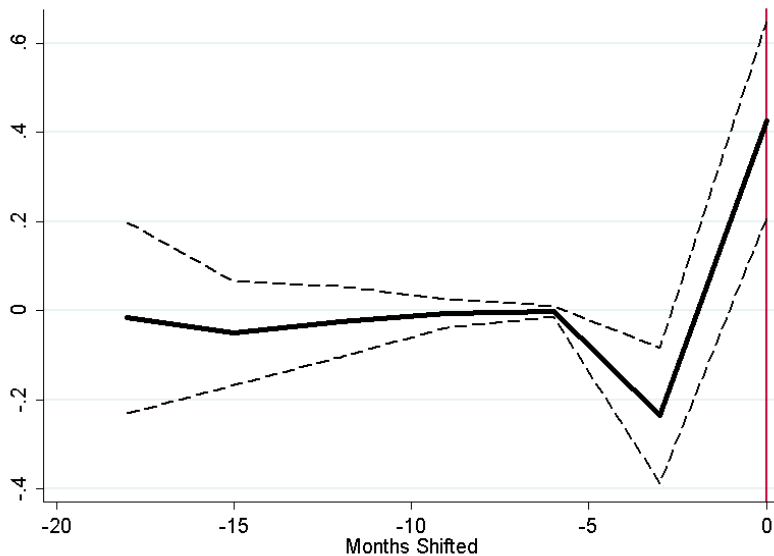
Time-shifted Placebos: Log Earnings



Time-shifted Placebos: Country Exits



Time-shifted Placebos: Employer Transitions



Selection Based on Prior Contracts?

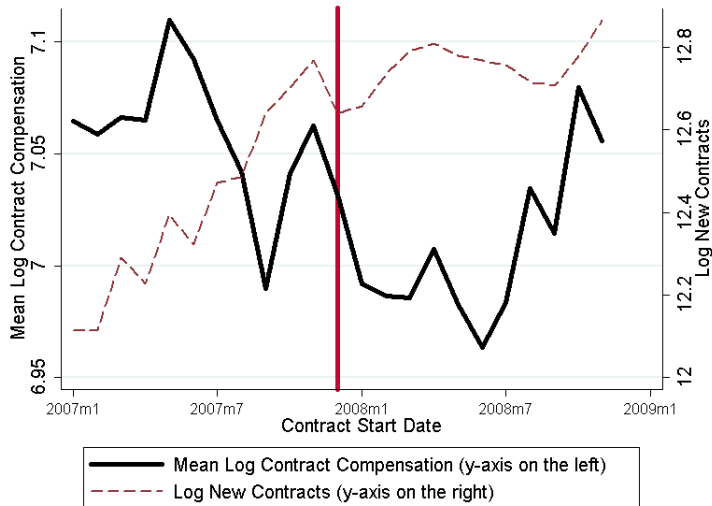




Figure: Contract Compensation and Number of New Contracts Three

Heterogeneity in Effects

- By time 
- By worker characteristics 
- Look at switchers and stayers separately.
- Unconditional quantile effects (Firpo, Fortin, Lemieux 2009).

Switchers or Stayers?

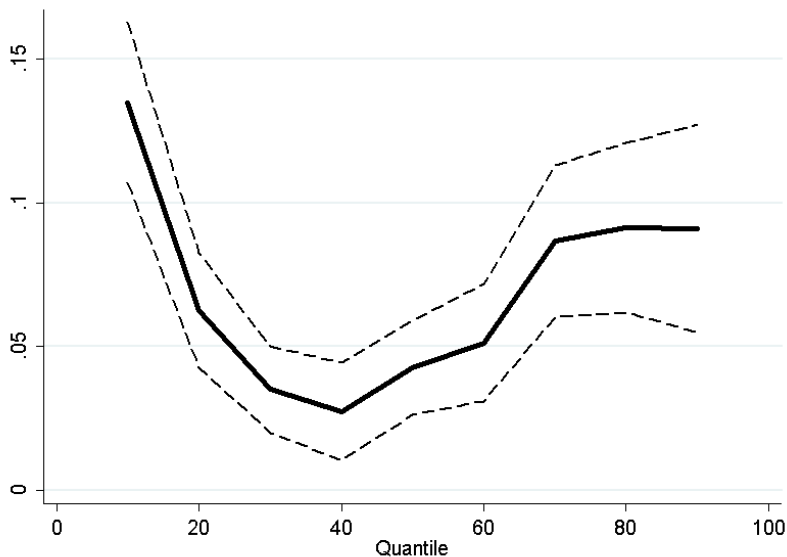
- Estimate models with stayers only, as well as firm FE

Table: Effects on Wages

	Stayers		Full Sample	
	(1)	(2)	(3)	(4)
(Post-Pre Reform) X Post Expire	0.114*** (0.008)	0.109*** (0.010)	0.120*** (0.008)	0.107*** (0.010)
(Post-Pre Reform) X Contract Expire	0.013*** (0.005)	0.015*** (0.006)	0.018*** (0.005)	0.015*** (0.006)
Polynomials in Time to Reform	No	Yes	No	Yes
Worker Characteristics	No	Yes	No	Yes
Firm Fixed Effects	No	No	Yes	Yes
N	513780	334269	529502	342555
R-squared	0.017	0.023	0.748	0.723

All specifications include individual, year-month fixed effects and a constant term. Robust standard errors in parentheses.

Quantile Effects (Using RIF)



Firm Responses and New Entrants to the UAE

Identification Strategy:

- Post versus pre reform
- Variation in the number of worker contracts expiring in each period

Discussion:

- Contracts are 3 years long, so the number of contracts expiring each period is plausibly exogenous to the reform or to contemporaneous circumstances.
- Control for firm fixed effects and time fixed effects
- Unlike individuals who are bound by the terms of their current contracts, firms can adjust some decisions in anticipation of upcoming expirations.

Firm Responses: Specifications

We estimate:

$$y_{jt} = \beta^{Post2011} \log \text{Expire}_{jt} + \beta^{Pre2011} \log \text{Expire}_{jt} + \delta_j + \delta_t + \epsilon_{jt} \quad (6)$$

where $\log \text{Expire}_{jt}$ is the logarithm of the number of contract expirations that firm j is experiencing in period t .

- The key estimates of interest are: $\beta^{Post2011} - \beta^{Pre2011}$
- To examine anticipation effects, we estimate three months of leads and lags in the firm's total contract expirations:

$$y_{jt} = \sum_{k=-3}^3 \beta_k^{Post2011} \log \text{Expire}_{jt} + \sum_{k=-3}^3 \beta_k^{Pre2011} \log \text{Expire}_{jt} + \delta_j + \delta_t + \epsilon_{jt} \quad (7)$$

where k refers to the leads and lags.

- Outcomes (y): log entrants and log earnings of entrants.

Table: Effect of the Reform on Log New Entrants Hired by Firms

	Full Sample			Both Sides	Trimmed
	(1)	(2)	(3)	(4)	(5)
(Post-Pre) × Log Contracts Expiring	-0.038*	-0.036*	0.017	-0.070***	-0.082***
	(0.021)	(0.021)	(0.013)	(0.023)	(0.029)
(Post-Pre Reform) × Leads ($\frac{\sum_{k=-3}^{-1} \beta_k^{post} - \beta_k^{pre}}{3}$)			-0.018**		
			(0.009)		
(Post-Pre Reform) × Lags ($\frac{\sum_{k=1}^3 \beta_k^{post} - \beta_k^{pre}}{3}$)			-0.011		
			(0.008)		
Leads and Lags	No	No	Yes	No	No
City X Year-Month Fixed Effects	No	Yes	No	No	No
N	220752	220752	99425	118801	87918
Number of Clusters	17884	17884	9270	5557	5412
R-squared	0.133	0.142	0.040	0.158	0.150
Mean of Dep. Var.	0.139	0.139	0.110	0.159	0.162
Std. Dev.	0.466	0.466	0.410	0.515	0.526

All specifications include firm and year-month fixed effects. Standard errors clustered by firm in parentheses. ***, **, * denotes significance at the 1, 5, and 10% levels, respectively.

Table: Effect of the Reform on Log Earnings of New Entrants

	Full Sample			Both Sides	Trimmed
	(1)	(2)	(3)	(4)	(5)
(Post-Pre) × Log Contracts Expiring	-0.034*	-0.034*	-0.015	-0.023	0.001
	(0.019)	(0.019)	(0.023)	(0.021)	(0.025)
(Post-Pre Reform) × Leads ($\frac{\sum_{k=-3}^{-1} \beta_k^{post} - \beta_k^{pre}}{3}$)			-0.022**		
			(0.010)		
(Post-Pre Reform) × Lags ($\frac{\sum_{k=1}^3 \beta_k^{post} - \beta_k^{pre}}{3}$)			0.013		
			(0.010)		
Leads and Lags	No	No	Yes	No	No
City X Year-Month Fixed Effects	No	Yes	No	No	No
N	27437	27437	9302	15072	10881
Number of Clusters	12868	12868	3392	4849	3897
R-squared	0.010	0.024	0.027	0.009	0.007
Mean of Dep. Var.	7.065	7.065	7.007	7.052	7.042
Std. Dev.	0.753	0.753	0.749	0.715	0.714

All specifications include firm and year-month fixed effects. Standard errors clustered by firm in parentheses. ***, **, * denotes significance at the 1, 5, and 10% levels, respectively.

Recovering Labor Supply Elasticity for New Migrants

- Preferred estimates: $\Delta \log w_r = -0.034$, $\Delta \log L_r = -0.038$, and $\Delta \log w_c = 0.11$
- Plug into the following equation (recall ϵ is the labor supply elasticity):

$$\Delta \log w_r = \frac{1}{\epsilon_r} \Delta \log L_r \quad (8)$$

- This implies ϵ_r of 1.1 (and $\eta_r = 0.5$)
- New entrants are paid about half of their marginal product



Recovering Labor Supply Elasticity for Incumbent Migrants

- To calculate η_c use following relationship:

$$\Delta \log \eta_c = \Delta \log w_c - \Delta \log w_r - \frac{1}{\sigma} \Delta \log(1 - q(w_c))L_c - \Delta \log L_r \quad (9)$$

- σ = elasticity of substitution between incumbent and new migrants
- Two ways to recover ϵ_c^{post}
 - Assume $\epsilon_c^{pre} = \epsilon_r$, then $\epsilon_c^{post} = 1.26$ to 1.5 depending on σ .
 - Assume perfect substitutes, so $\sigma = \infty$, then $\epsilon_c^{post} = 1.22$.
- Workers got 50% of their marginal product before the reform, increasing to up to 60% following the reform.
- Can compare to other Pigouvian exploitation rates.

Alternative Explanations or Concerns

- Increases in match-specific quality 
 - Low level of transitions.
 - Results the same in the stayer subpopulation.
 - Heterogeneity by education and quantile estimates not consistent with this mechanism
- Change in contract duration may increase relative demand for workers already in country. 
 - But recruitment costs estimated to be only 20% of one year's earnings.
 - Difficult to account for a 10% increase in earnings each year.

Conclusion

- Results highlight the trade-offs associated with increasing labor market competition for immigrants within a country
- Workers already in the country benefit (increased earnings, increased labor mobility, lower country exits)
 - Reduction in exits suggests that the increased earnings do not just reflect a compensating differential for unobserved job quality
- However, welfare losses for individuals in developing countries who would have been able to find jobs under the restrictive system that no longer can migrate to the UAE.
- Larger normative implications for design of migration policy.
 - Distributional effects of migration.
 - Larger population of longer-term migrants.