

The Internal Labor Markets of Business Groups¹

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¹The views and opinions expressed are those of the authors alone and do not necessarily reflect those of the Financial Markets Commission of Chile.

What is a Business Groups (BGs)?

- ▶ **Business Group (BG):** Legally independent firms, often in different industries, but controlled by same ultimate owner
- ▶ BG \Rightarrow Ownership network
- ▶ Typical corporate structure in Asia, continental Europe, Latin America
 - ▶ Less common in the US
 - ▶ Similar to US conglomerates, but with better defined firm boundaries

(Probably) Largest BG in the World

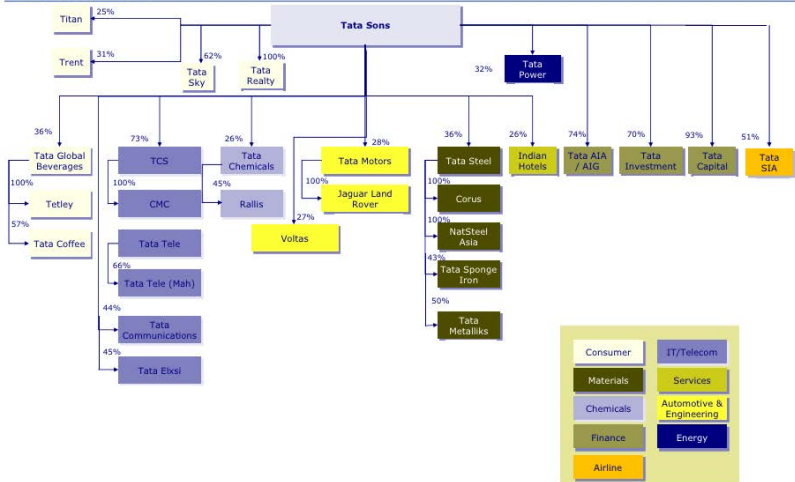
24 October 2016

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Tata group structure

Figure 3

Tata Sons Holdco structure



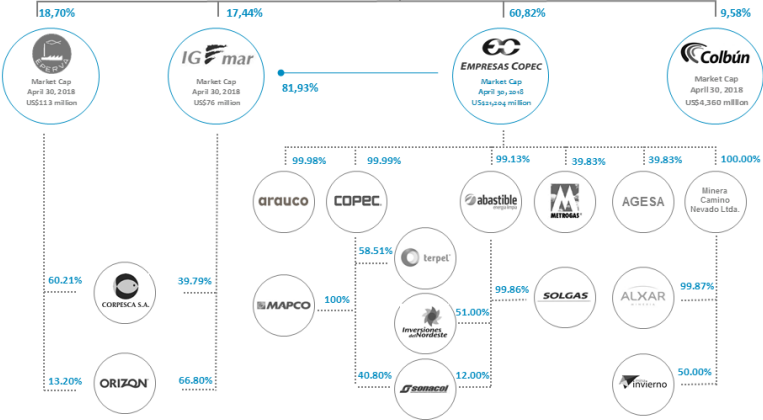
Source: Companies, Ace Equity, CLSA

Example of a Business Group in Chile

PARENT LEVEL INFORMATION



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Internal reallocation of resources?

- ▶ BG use **internal capital market** to overcome financial frictions (Gopalan, Nanda, and Seru 2007; Buchuk et al. 2014; Almeida, Kim, and Kim 2015)
- ▶ Less evidence that BGs use **internal labor markets (ILMs)** (Belenzon and Tzolmon 2015; Faccio and O'Brien 2017; Ciccone et al. 2018)
 - ▶ Some evidence of internal labor markets in conglomerates and multi-plant firms (Tate and Yang 2015; Giroud and Mueller 2018; Silva 2018)

This Paper: The ILMs of BGs

- ▶ Combine three sources of datasets: BGs structures, employer-employee data, and international trade
- ▶ Use firm-level trade shocks in Bartik-type strategy
- ▶ Affiliated vs non-affiliated firms response to trade shocks

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 2. **Why:** Heterogeneity analysis \Rightarrow Potential underlying mechanisms
 - ▶ Results less consistent with diversification, insurance or firing costs
 - ▶ Instead: BGs ease the flow of intangible inputs (e.g., management practices, know-how, organizational capital/culture, etc.) by transferring top employees

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 3. **Consequences:** Effects of the ILMs of BGs on Wages
 - ▶ Wage spillover to other workers in destination firm

Data

Ownership Structure

- ▶ Hand-collected ownership structures from annual reports of listed firms.
- ▶ Plus private firms that consolidate with listed firms, or where listed firms have permanent investments.
- ▶ **BG**: a set of two or more listed firms, with their affiliated private firms, that have a common controlling shareholder.
- ▶ Aprox 30 BG, 100 listed firms, 800 private firms.

Matched Employer-Employee Data

- ▶ Administrative data: unemployment insurance. All formal jobs in Chile for 2004-2015 (4.6 million employees).
- ▶ Employee: wage, age, gender.
- ▶ Firm: total employment (size), wage distribution, industry.
- ▶ **Advantage:** follow employees across time and firms.

International Trade

- ▶ Administrative data: customs with products at six-digit level. All formal exports/imports for 2004-2015.
- ▶ **International trade shock at firm level**: weighted average of price changes in exports (imports) for each firm i :

$$\Delta p_{it} = \sum_{j=1}^N s_{ij0} \Delta p_{jt}^G$$

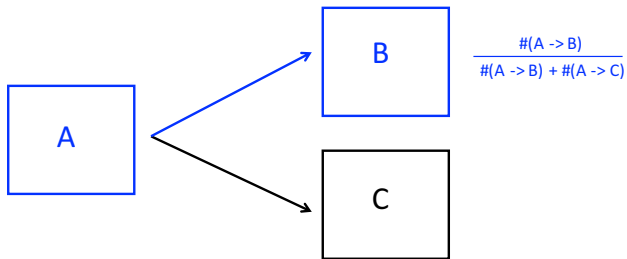
- ▶ s_{ij0} initial weight of product-country j (Bartik-type strategy).
- ▶ Δp_{jt}^G global prices excluding trade flows with Chile (Comtrade).
- ▶ Small and open economy: plausible **exogenous** shocks.

Evidence of ILM of BGs

Employment Outflow Measure

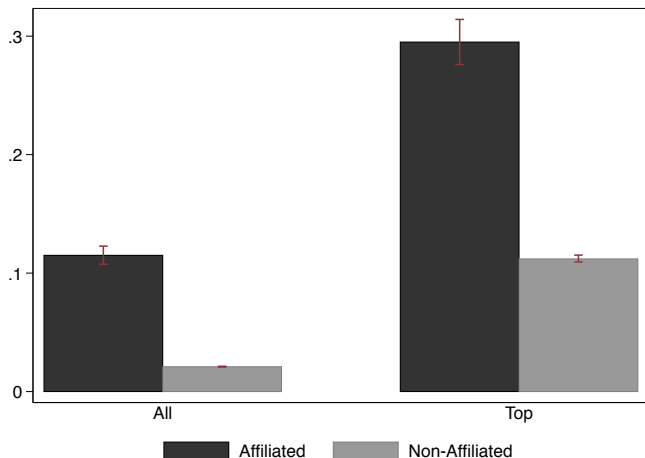
Origin Firm

Destination Firm



If A and B belong to the same business group: **affiliated**

Employment Outflows Relatively Bigger Between BG Firms



A First Approximation

- ▶ Regression Specification:

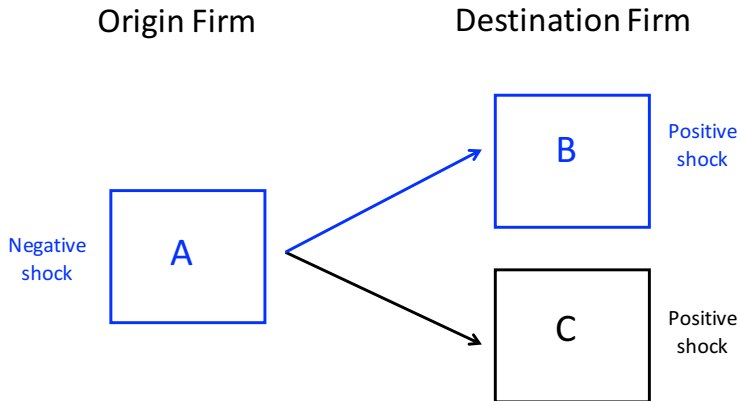
$$\text{Outflow}_{odt} = \beta \times \text{Same Group}_{odt} + \alpha_o + \alpha_d + \alpha_t + \mathbf{X}_{dt}\gamma_d + \dots \\ + \mathbf{X}_{ot}\gamma_o + \epsilon_{odt}$$

- ▶ where o , d , and t stand for origin, destination, and year
- ▶ Same Group_{odt} is a dummy for o and d being part of the same BG
- ▶ \mathbf{X}_{ot} and \mathbf{X}_{dt} are covariates at the origin-year and destination-year level.
- ▶ α_o , α_d , and α_t are fixed effects
- ▶ SE: double clustered at the origin and destination level

Labor Flows between Pairs of Firms are Bigger within BGs

	All Workers	All Workers	Bot. 25	Mid. 50	Top 25
	(1)	(2)	(3)	(4)	(5)
Same BG	0.024*** (0.006)	0.022*** (0.006)	0.019*** (0.007)	0.023** (0.010)	0.047*** (0.015)
Δ Log Avg. Wage		0.000 (0.001)	-0.002 (0.001)	0.003* (0.002)	-0.017** (0.008)
Log Employment Origin		-0.046*** (0.009)	-0.085*** (0.017)	-0.074*** (0.012)	-0.159*** (0.030)
Log Employment Destination		-0.002* (0.001)	-0.004** (0.002)	-0.006* (0.003)	-0.023** (0.011)
Log Emp. BG Origin		-0.103 (0.082)	-0.297* (0.178)	-0.206 (0.241)	0.235 (0.348)
Log Emp. BG Dest.		-0.118** (0.048)	-0.295*** (0.101)	-0.122 (0.143)	-0.286 (0.201)
Log N. Firms BG Origin		0.061** (0.030)	0.087* (0.045)	0.084** (0.032)	0.285* (0.154)
Log N. Firms BG Dest.		0.011 (0.016)	0.017 (0.021)	0.023 (0.032)	-0.036 (0.161)
<i>R</i> ²	0.522	0.594	0.680	0.638	0.694
Origin FE	✓	✓	✓	✓	✓
Destination FE	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓
Mean DV	.02	.02	.037	.047	.12
SD DV	.043	.042	.066	.084	.158
<i>N</i>	21269	20424	9267	7612	2493

Illustration of Empirical Strategy



A and B belong to the same business group

Empirical Strategy

- ▶ Regression Specification:

$$\begin{aligned}\text{Outflow}_{odt} = & \delta \times [\text{Same Group}_{odt} \times (\Delta p_{dt} - \Delta p_{ot})] \\ & + \beta \times \text{Same Group}_{odt} + \gamma(\Delta p_{dt} - \Delta p_{ot}) \\ & + \mathbf{X}_{dt}\gamma_d + \mathbf{X}_{ot}\gamma_o + \alpha_o + \alpha_d + \alpha_t + \epsilon_{odt}\end{aligned}$$

- ▶ Δp_{dt} and Δp_{ot} are standardized versions of the international trade shock.
- ▶ Null hypothesis: $\delta = 0$. In the spirit of tests of internal capital markets (Stein 1997).




As a Response to Shocks, Flows within BGs are Bigger

	All Workers		Bot. 25	Mid. 50	Top 25	Top 20	Top 10
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Δ Exports x Same BG	0.004 (0.002)	0.004* (0.002)	-0.000 (0.002)	0.008 (0.005)	0.032** (0.013)	0.027* (0.014)	0.091*** (0.029)
Δ Imports x Same BG	-0.004 (0.004)	-0.004 (0.004)	-0.009 (0.007)	-0.015* (0.009)	-0.004 (0.012)	0.002 (0.012)	-0.002 (0.020)
Δ Exports	0.000 (0.001)	0.001 (0.001)	0.001 (0.001)	0.002 (0.002)	0.006 (0.004)	0.001 (0.005)	-0.018 (0.012)
Δ Imports	-0.001 (0.001)	-0.001 (0.001)	0.001 (0.001)	-0.001 (0.002)	-0.002 (0.002)	-0.005 (0.003)	-0.003 (0.008)
Same BG	0.024*** (0.006)	0.022*** (0.006)	0.018*** (0.007)	0.024** (0.010)	0.044*** (0.016)	0.052** (0.023)	0.016 (0.030)
R^2	0.522	0.594	0.680	0.639	0.697	0.688	0.758
Origin FE	✓	✓	✓	✓	✓	✓	✓
Destination FE	✓	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓
Mean DV	.02	.02	.037	.047	.122	.144	.23
SD DV	.043	.042	.066	.084	.16	.181	.249
Mean Den. DV	1.3	1.3	1.1	1.3	1.5	1.4	1.4
N	21009	20188	9184	7523	2457	1974	922

Tobin's Q and Broader Sample

	All Workers		Top 25	
	(1)	(2)	(3)	(4)
$\Delta Q \times \text{Same BG}$	0.021 (0.015)	0.024 (0.017)	0.063** (0.028)	0.057** (0.024)
ΔQ	0.000 (0.001)	-0.000 (0.001)	0.007 (0.006)	0.005 (0.006)
Same BG	0.039*** (0.005)		0.059*** (0.015)	
R^2	0.666	0.743	0.755	0.815
Pair FE		✓		✓
Origin FE	✓		✓	
Destination FE	✓		✓	
Year FE	✓	✓	✓	✓
Mean DV	.028	.025	.136	.124
SD DV	.075	.07	.205	.199
Mean Den. DV	1.3	2	1.3	1.6
N	50591	24041	7427	3023

Robustness of ILM for Top Workers in BGs

- ▶ Within BGs, across firms 
- ▶ Extensive margin results within and across industries with substantial flows
- ▶ Net flows 
- ▶ Does not hold for high wage versus low wage workers 

Why Are There Internal Labor Markets? Heterogeneity Analysis

Standard Explanations for ILMs

- ▶ **Diversification:** more diversified BGs can afford risk-taking and a faster response to shocks.
- ▶ **Transaction Costs:** Hiring/firing costs (e.g. severance payments)
- ▶ **Unemployment Insurance:** BGs insure workers against negative shocks in exchange for lower wages (Ciccone et al. 2018)

Evidence Not Consistent With Some Standard Explanations

	Baseline	Tenure	BG Tenure	Distance	Age	BG N. Sectors	BG Emp. Dispersion	Push	Pull
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Δ Exports \times Same BG \times Z		-0.008 (0.015)	-0.010 (0.014)	0.013 (0.085)	-0.096* (0.052)	-0.011 (0.018)	-0.049 (0.033)	-0.052* (0.030)	-0.026 (0.026)
Δ Exports \times Same BG	0.032** (0.013)	0.041** (0.020)	0.043** (0.020)	0.029* (0.017)	0.382** (0.191)	0.048 (0.030)	0.106** (0.053)	0.061** (0.029)	0.042*** (0.015)
Δ Exports	0.006 (0.004)	0.012 (0.008)	0.012 (0.008)	0.008 (0.005)	0.004 (0.055)	0.005 (0.005)	0.006 (0.004)	0.006 (0.007)	0.005 (0.005)
Same BG	0.044*** (0.016)	0.022 (0.027)	0.029 (0.031)	0.044*** (0.019)	0.104 (0.227)	0.000 (0.061)	0.001 (0.084)	0.060** (0.025)	0.052*** (0.016)
R^2	0.697	0.700	0.700	0.699	0.699	0.700	0.699	0.699	0.699
Origin FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Destination FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mean DV	.122	.122	.122	.122	.122	.122	.122	.122	.122
SD DV	.16	.16	.16	.16	.16	.16	.16	.16	.16
Mean Den. DV	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
N	2457	2457	2457	2457	2457	2457	2457	2457	2457

Positive Pass-Through Not Consistent with Insurance

	All Workers		Bot. 25	Mid. 50	Top 25	Top 25 vs Stayers
	(1)	(2)	(3)	(4)	(5)	(6)
Δ Exports x Same BG	0.002 (0.008)	0.003 (0.008)	-0.013 (0.012)	0.007 (0.013)	0.066*** (0.021)	0.048** (0.023)
Δ Exports	-0.001 (0.003)	-0.002 (0.003)	0.005 (0.005)	-0.002 (0.005)	-0.009 (0.008)	-0.002 (0.009)
Same BG	-0.014 (0.024)	-0.018 (0.024)	-0.026 (0.038)	0.012 (0.041)	0.085* (0.046)	0.075 (0.052)
R^2	0.449	0.457	0.527	0.566	0.523	0.547
Origin FE	✓	✓	✓	✓	✓	✓
Destination FE	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓
Mean DV	.2	.2	.243	.176	.134	.087
SD DV	.408	.407	.428	.404	.355	.373
N	23372	22343	7384	9273	2604	2512

► Similar results based on wage ranking 

Our Explanation for ILMs: Accumulation of Intangibles

- ▶ **Intangible inputs** (e.g., knowledge, management practices) are crucial for production (Atalay, Hortacsu, and Syverson 2014), but:
 - ▶ Hard to define, quantify, observe and transfer between firms.
 - ▶ Often embedded in top employees.
 - ▶ Often acquired through relationship-specific investments.

- ▶ **BGs expand applicability of relationship-specific investments.**
⇒ Hold up and renegotiation: Consistent with positive pass-through


- ▶ **BGs as large hierarchies that lever on top employee knowledge.**
⇒ Managers higher up in the hierarchy have more incentives for accumulation of knowledge (better managers)

Top Workers Reallocated Within if Higher in the Hierarchy

	Baseline	Origin Controls Dest.	BG Pyramidity
	(1)	(2)	(3)
Δ Exports x Same BG x Z		0.424*** (0.107)	0.510*** (0.156)
Δ Exports x Same BG	0.032** (0.013)	0.038** (0.015)	0.019 (0.012)
Δ Exports	0.006 (0.004)	0.007 (0.004)	0.006 (0.004)
Same BG	0.044*** (0.016)	0.022 (0.021)	0.035** (0.017)
R^2	0.697	0.713	0.703
Origin FE	✓	✓	✓
Destination FE	✓	✓	✓
Year FE	✓	✓	✓
Mean DV	.122	.122	.122
SD DV	.16	.16	.16
Mean Den. DV	1.1	1.1	1.1
N	2457	2457	2457

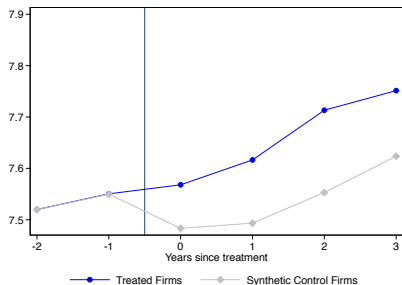
Firm-Level Effects of Internal Labor Markets

Positive Effects of BGs' ILM of Top Workers

- ▶ Reduced Form Approach 
 - ▶ BGs are able to stabilize employment better around export shocks
 - ▶ BGs have higher wage pass-through of export price shocks

- ▶ Synthetic Control Approach
 - ▶ Treated: BG firms that receive top employee from the same BG
 - ▶ Control: BG firms that receive top employee from unaffiliated firm
 - ▶ Based on: employment (size), exports and imports shocks, industry
 - ▶ Main outcome: average wage
 - ▶ Robust to other definitions of control groups

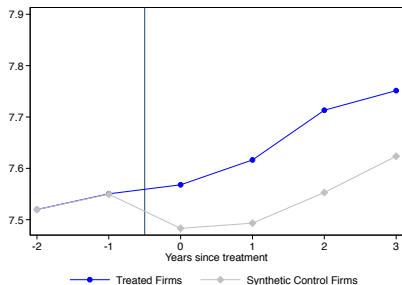
Receiving-Firm Wage Increases after Receiving Top Worker



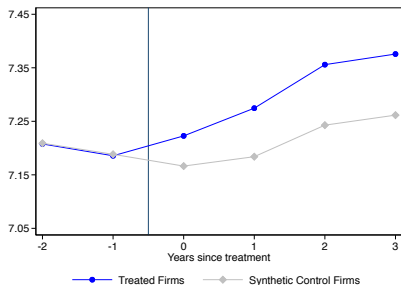
(a) All Workers

► Confidence intervals

Receiving-Firm Wage Increases after Receiving Top Worker



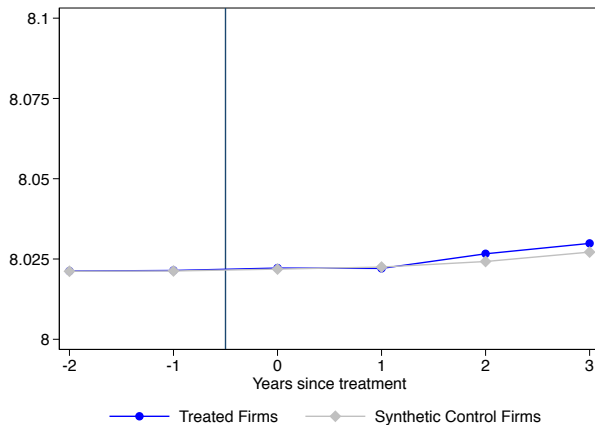
(c) All Workers



(d) Incumbent Workers

► Confidence intervals

No Change in Sending-Firm Wage



► Thus, overall wage gains at the BG level

Conclusions

Internal Labor Markets of Business Groups

- ▶ Evidence of BG's ILM in response to trade shocks
 - ▶ Effects concentrated only on top-occupation workers
- ▶ Firm wages spillovers after receiving top worker from within the BG
- ▶ Our take: common ownership and transfer of intangibles
 - ▶ Such as knowledge about management practices
 - ▶ Rather than diversification, insurance or transaction costs
- ▶ **Agenda:** Ownership structure of firms and labor markets

Internal Labor Markets of Business Groups

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- ▶ **Agenda:** Ownership structure of firms and labor markets

Thanks!

Employment Outflows Relatively Bigger Between BG Firms

Pairs of Firms	Means (across firm-pair-years)			
	by quartiles of wage distribution			
	All	Q1	Q2-Q3	Q4
BG-NonBG	2.1	3.7	4.4	11.1
BG-BG: Diff	3.1	5.1	6.5	13.1
BG-BG: Same	11.5	15.3	19.3	29.5

- ▶ Number of firms and pairs
- ▶ Results even stronger when weighted by wages

▶ Back

Number of Firms and Pairs [▶ Back](#)

# Firms	Full sample	Mean per year
All	12888	2107
BG	206	86
Non BG	12682	2021

# Firm Pairs	Full sample	Mean per BG firm
BG-BG	1038	5
BG-Non BG	21751	135

ILM of BGs for Top Workers holds Within Groups [▶ Back](#)

	All Workers		Bot. 25	Mid. 50	Top 25	Top 20	Top 10
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Δ Exports	0.004* (0.002)	0.004* (0.002)	0.001 (0.001)	0.013* (0.007)	0.036** (0.017)	0.026* (0.015)	0.045** (0.022)
Δ Imports	-0.005 (0.004)	-0.005 (0.003)	-0.005 (0.004)	-0.006 (0.010)	-0.011 (0.016)	-0.008 (0.017)	-0.001 (0.028)
R^2	0.505	0.591	0.797	0.651	0.753	0.742	0.837
Origin FE	✓	✓	✓	✓	✓	✓	✓
Destination FE	✓	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓
Mean DV	.051	.051	.08	.096	.189	.219	.312
SD DV	.084	.084	.115	.134	.213	.246	.298
Mean Den. DV	4.9	4.9	2.1	4.4	3.1	2.8	2.4
N	576	576	255	234	218	201	123

Gross vs Net Flows [▶ Back](#)

	All Workers		Bot. 25		Mid. 50		Top 25		Top 20		Top 10	
	(1) Gross	(2) Net	(3) Gross	(4) Net	(5) Gross	(6) Net	(7) Gross	(8) Net	(9) Gross	(10) Net	(11) Gross	(12) Net
Δ Exports x Same BG	0.004* (0.002)	0.005* (0.003)	-0.000 (0.002)	0.003 (0.003)	0.008 (0.005)	0.010 (0.009)	0.032** (0.013)	0.016 (0.013)	0.027* (0.014)	0.008 (0.016)	0.091*** (0.029)	0.117*** (0.042)
Δ Exports	0.001 (0.001)	0.000 (0.001)	0.001 (0.001)	0.002 (0.001)	0.002 (0.002)	0.002 (0.002)	0.006 (0.004)	0.007 (0.005)	0.001 (0.005)	0.002 (0.006)	-0.018 (0.012)	-0.022* (0.013)
Same BG	0.022*** (0.006)	0.017*** (0.005)	0.018*** (0.007)	0.020** (0.010)	0.024** (0.010)	0.012 (0.013)	0.044*** (0.016)	0.023 (0.023)	0.052** (0.023)	0.044 (0.032)	0.016 (0.030)	0.002 (0.047)
R^2	0.594	0.632	0.680	0.702	0.639	0.662	0.697	0.726	0.688	0.718	0.758	0.795
Origin FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Destination FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mean DV	.02	.02	.037	.038	.047	.049	.122	.125	.144	.148	.23	.239
SD DV	.042	.042	.066	.068	.084	.088	.16	.161	.181	.183	.249	.258
Mean Den. DV	1.2	1.1	1.2	1.1	1.3	1.1	1.1	1	1.1	1	1.1	1
N	20188	16583	9184	7014	7523	5723	2457	1899	1974	1521	922	676

	All Workers		Bot. 25	Mid. 50	Top 25
	(1)	(2)	(3)	(4)	(5)
Δ Exports \times Same BG	0.004 (0.002)	0.003* (0.002)	0.005* (0.003)	0.001 (0.003)	0.006 (0.006)
Δ Imports \times Same BG	-0.003 (0.004)	-0.004 (0.004)	-0.018 (0.012)	-0.024*** (0.009)	-0.008 (0.008)
Δ Exports	0.000 (0.001)	0.001 (0.001)	-0.003* (0.002)	0.002 (0.001)	0.005*** (0.002)
Δ Imports	-0.001 (0.001)	-0.001 (0.001)	0.002 (0.002)	0.001 (0.001)	-0.000 (0.001)
Same BG	0.024*** (0.006)	0.022*** (0.006)	0.016* (0.009)	0.033** (0.013)	0.044*** (0.011)
R^2	0.522	0.594	0.801	0.664	0.685
Origin FE	✓	✓	✓	✓	✓
Destination FE	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓
Mean DV	.02	.02	.039	.042	.067
SD DV	.043	.042	.085	.076	.111
N	21084	20253	6259	7532	5083

Positive Pass-Through Based on Wage Ranking ▶ Back

	All Workers		Bot. 25	Mid. 50	Top 25
	(1)	(2)	(3)	(4)	(5)
Δ Exports x Same BG	0.059** (0.028)	0.056** (0.028)	0.033 (0.032)	0.021 (0.029)	0.096** (0.045)
Δ Imports x Same BG	-0.005*** (0.002)	-0.001 (0.013)	0.112 (2.851)	0.020 (0.019)	-0.077*** (0.015)
Δ Exports	-0.014 (0.012)	-0.011 (0.012)	-0.024 (0.017)	0.011 (0.010)	-0.025 (0.016)
Δ Imports	0.009 (0.013)	0.009 (0.013)	0.024 (0.018)	0.018 (0.014)	-0.010 (0.016)
Same BG	0.021 (0.059)	0.007 (0.065)	-0.052 (0.104)	0.014 (0.072)	0.039 (0.065)
R^2	0.339	0.338	0.353	0.368	0.451
Origin FE	✓	✓	✓	✓	✓
Destination FE	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓
Mean DV	.283	.271	.99	-.323	-.452
SD DV	1.246	1.245	1.274	.918	.681
N	21009	20188	9184	7523	2457

BG Stabilize Employment & Higher Wage Pass-Through

▶ Back

	Δ Log. Wages(t)				Δ Log. Employment(t)
	(1) All	(2) Bot. 25	(3) Mid. 50	(4) Top 25	(5)
Δ Export(t) x BG	0.004 (0.004)	0.002 (0.009)	0.004 (0.005)	0.002 (0.006)	-0.016 (0.017)
Δ Export(t-1) x BG	0.017*** (0.005)	0.016* (0.010)	0.019*** (0.006)	0.015*** (0.005)	-0.040* (0.021)
Δ Export(t-2) x BG	0.011** (0.006)	0.005 (0.011)	0.015** (0.006)	0.009 (0.006)	-0.043* (0.023)
Δ Export(t-3) x BG	0.010* (0.006)	0.011 (0.010)	0.008 (0.008)	0.011** (0.004)	-0.041** (0.021)
Δ Export(t)	-0.000 (0.002)	0.003 (0.004)	-0.001 (0.002)	0.000 (0.003)	0.003 (0.005)
Δ Export(t-1)	-0.004* (0.002)	-0.002 (0.004)	-0.005* (0.003)	-0.003 (0.003)	0.006 (0.007)
Δ Export(t-2)	-0.006*** (0.002)	-0.006 (0.004)	-0.007** (0.003)	-0.005* (0.003)	0.009 (0.006)
Δ Export(t-3)	-0.005*** (0.002)	-0.005 (0.004)	-0.005*** (0.002)	-0.004* (0.003)	0.005 (0.005)
R^2	0.173	0.103	0.147	0.176	0.256
Year FE	✓	✓	✓	✓	✓
Firm FE	✓	✓	✓	✓	✓
Mean DV	.035	.026	.036	.039	.068
SD DV	.117	.219	.149	.129	.304
N	6359	6359	6359	6359	6359

Synthetic Controls

	Receiver All employees	Receiver Stayers	Sender
Number of treated units	80	80	175
Potential controls	2,964	2,964	19,512
Average effect	0.123	0.094	0.001
CI 99%	[-0.006, 0.002]	[-0.001, 0.070]	[-0.004, 0.0004]
CI 95%	[-0.002, 0.001]	[-0.000, 0.007]	[-0.004, 0.0004]
